



Daily Coding Problem

Good morning! Here's your coding interview problem for today.

This problem was asked by Google.

Given a list of integers S and a target number k, write a function that returns a subset of S that adds up to k. If such a subset cannot be made, then return null.

Integers can appear more than once in the list. You may assume all numbers in the list are positive.

For example, given S = [12, 1, 61, 5, 9, 2] and k = 24, return [12, 9, 2, 1] since it sums up to 24.

Firstly, it has to be expressed again why it stretched to C(6,24)... It is because of the 1 in the subset...and k=24. Perhaps cycles can be skipped taking examination of the set... For instance, we can examine the next highest number available from the subset.

The subset is:

| S = [12, 1, 61, 5, 9, 2]

This has created a nightmare scenario since in essence

24 can be calculated with below... This is just example I have completed manually.

| S = [12, 1, 61, 5, 9, 2]

24 x 1			r=24
22 x 1	1 x 2		r=23
20 x 1	2 x 2		r=22
18 x 1	3 x 2		r=21
16 x 1	4 x 2		r=20
14 x 1	5 x 2		r=19
12 x 1	6 x 2		r=18
10 x 1	7 x 2		r=17
8 x 1	8 x 2		r=16
6 x 1	9 x 2		r=15
4 x 1	10 x 2		r=14
2 x 1	11 x 12		r=13

0 x1	12 x 2		r=12
7 x 1	1 x 2	3 x 5	r=11
1 x 12	1 x 5	7 x 1	r=10
1 x 5, 6 x 2	7 x 1		r=9
4 x 2, 2 x 1	1 x 9	1 x 5	r=8
1 x 5, 1 x 2	1 x 9, 3 x 1	1x5	r=7
	2 x 2	4 x 5	r=6
12 x 1	1 x 9	3 x 1	r=5
12 x 1, 1x1	1 x 9	2 x 2	r=4
			r=3 (not possible)
		2 x 12	r=2
			r=1 (not possible)

So it can be seen that execution cycles can not be saved whatsoever apart from r=3 or r=1 This only carries under 100 cycles...

***** OUTPUT *****

NOTE ALL EXCESSIVE SCREEN OUTPUTS HAVE BEEN REMOVED TO MAXIMISE THE RETURNED SCENARIOS:

TEST CASE:

```
static int k = 24; //
```

```
int [] X = new int []{12,1,61,5,9,2}; //user defined
```

```
}while (cycles<combinations);|
```

It can be seen that under regular conditions, it has reached 678 subsets. This also matches with unique combinations taking all outcomes from the set.

This is clear indication that code is on right path. And there are no duplicates in the subset.

It can also be seen that there are no outcomes in the output marked in blue beyond: $C^R(6,16)$

We know that in previous code attempt, it also capacity to span more than 9 numbers in set entry (modifying the X array with more 1s). But for now, all parameters of the challenge are kept intact...

Note: Combination.java uses unchecked or unsafe operations.

Note: Recompile with -Xlint:unchecked for details.

Welcome to Online IDE!! Happy Coding :)

Maxvalue: 24

COMBINATIONS (WITH REPLACEMENT)

$C^R(n + r) = (n+r-1)! / r!(n-1)!$

$C^R(6,0) = 5! / 0!(5)!$

Combinations: 1

*****INITIAL VALUE OF CYCLES: 0

*****NEW VALUE CYCLES: 1

*****RUNNING TOTAL CYCLES: 1

***PROCESSING SET AT INDEX: 0

ENDING AT INDEX:*** 0

COMBINATIONS (WITH REPLACEMENT)

$C^R(n + r) = (n+r-1)! / r!(n-1)!$

$C^R(6,1) = 6! / 1!(5)!$

Combinations: 6

*****INITIAL VALUE OF CYCLES: 0

*****NEW VALUE CYCLES: 6

*****RUNNING TOTAL CYCLES: 7

***PROCESSING SET AT INDEX: 0

ENDING AT INDEX:*** 0

COMBINATIONS (WITH REPLACEMENT)

$C^R(n + r) = (n+r-1)! / r!(n-1)!$

$C^R(6,2) = 7! / 2!(5)!$

Combinations: 21

*****INITIAL VALUE OF CYCLES: 0

*****NEW VALUE CYCLES: 21

*****RUNNING TOTAL CYCLES: 28

***PROCESSING SET AT INDEX: 0

ENDING AT INDEX:*** 1

12,12 Subset: 1 at cycle number: 28

COMBINATIONS (WITH REPLACEMENT)

$C^R(n + r) = (n+r-1)! / r!(n-1)!$

$$C^R(6,3) = 8! / 3!(5)!$$

Combinations: 56

*****INITIAL VALUE OF CYCLES: 0

*****NEW VALUE CYCLES: 56

*****RUNNING TOTAL CYCLES: 84

***PROCESSING SET AT INDEX: 1

ENDING AT INDEX:*** 1

COMBINATIONS (WITH REPLACEMENT)

$$C^R(n + r) = (n+r-1)! / r!(n-1)!$$

$$C^R(6,4) = 9! / 4!(5)!$$

Combinations: 126

*****INITIAL VALUE OF CYCLES: 0

*****NEW VALUE CYCLES: 126

*****RUNNING TOTAL CYCLES: 210

***PROCESSING SET AT INDEX: 1

ENDING AT INDEX:*** 6

1,2,12,9 Subset: 2 at cycle number: 210

5,12,5,2 Subset: 3 at cycle number: 210

12,1,2,9 Subset: 4 at cycle number: 210

9,12,2,1 Subset: 5 at cycle number: 210

12,5,5,2 Subset: 6 at cycle number: 210

COMBINATIONS (WITH REPLACEMENT)

$$C^R(n + r) = (n+r-1)! / r!(n-1)!$$

$$C^R(6,5) = 10! / 5!(5)!$$

Combinations: 252

*****INITIAL VALUE OF CYCLES: 0

*****NEW VALUE CYCLES: 252

*****RUNNING TOTAL CYCLES: 462

***PROCESSING SET AT INDEX: 6

ENDING AT INDEX:*** 14

12,2,9,1 Subset: 7 at cycle number: 462

12,9,1,2 Subset: 8 at cycle number: 462

9,5,9,1 Subset: 9 at cycle number: 462

9,2,9,2,2 Subset: 10 at cycle number: 462

2,1,12,9 Subset: 11 at cycle number: 462

2,12,1,9 Subset: 12 at cycle number: 462

5,1,5,12,1 Subset: 13 at cycle number: 462

2,5,12,5 Subset: 14 at cycle number: 462

COMBINATIONS (WITH REPLACEMENT)

$$C^R(n + r) = (n+r-1)! / r!(n-1)!$$

$$C^R(6,6) = 11! / 6!(5)!$$

Combinations: 462

*****INITIAL VALUE OF CYCLES: 0

*****NEW VALUE CYCLES: 462

*****RUNNING TOTAL CYCLES: 924

***PROCESSING SET AT INDEX: 14

ENDING AT INDEX:*** 26

9,2,1,12 Subset: 15 at cycle number: 924
9,9,5,1 Subset: 16 at cycle number: 924
1,9,5,9 Subset: 17 at cycle number: 924
2,12,5,5 Subset: 18 at cycle number: 924
2,12,9,1 Subset: 19 at cycle number: 924
5,9,5,5 Subset: 20 at cycle number: 924
5,12,2,5 Subset: 21 at cycle number: 924
5,5,2,2,9,1 Subset: 22 at cycle number: 924
2,9,12,1 Subset: 23 at cycle number: 924
5,5,5,9 Subset: 24 at cycle number: 924
2,5,2,9,5,1 Subset: 25 at cycle number: 924
1,5,9,9 Subset: 26 at cycle number: 924

COMBINATIONS (WITH REPLACEMENT)

$C^R(n + r) = (n+r-1)! / r!(n-1)!$

$C^R(6,7) = 12! / 7!(5)!$

Combinations: 792

*****INITIAL VALUE OF CYCLES: 0

*****NEW VALUE CYCLES: 792

*****RUNNING TOTAL CYCLES: 1716

***PROCESSING SET AT INDEX: 26

ENDING AT INDEX:*** 56

5,2,5,2,1,9 Subset: 27 at cycle number: 1716
1,2,5,9,1,1,5 Subset: 28 at cycle number: 1716
2,9,9,1,1,2 Subset: 29 at cycle number: 1716
9,5,5,5 Subset: 30 at cycle number: 1716
9,5,1,9 Subset: 31 at cycle number: 1716
2,2,9,2,9 Subset: 32 at cycle number: 1716
5,2,5,12 Subset: 33 at cycle number: 1716
1,12,2,9 Subset: 34 at cycle number: 1716
1,5,12,1,5 Subset: 35 at cycle number: 1716
12,5,1,5,1 Subset: 36 at cycle number: 1716
2,9,1,12 Subset: 37 at cycle number: 1716
1,9,12,1,1 Subset: 38 at cycle number: 1716
5,9,1,9 Subset: 39 at cycle number: 1716
12,1,2,5,2,2 Subset: 40 at cycle number: 1716
12,9,2,1 Subset: 41 at cycle number: 1716
1,1,1,2,5,9,5 Subset: 42 at cycle number: 1716
12,2,5,5 Subset: 43 at cycle number: 1716
1,9,1,12,1 Subset: 44 at cycle number: 1716
9,1,5,9 Subset: 45 at cycle number: 1716
2,12,1,5,1,1,2 Subset: 46 at cycle number: 1716
5,1,9,9 Subset: 47 at cycle number: 1716
1,1,1,12,9 Subset: 48 at cycle number: 1716
5,5,9,5 Subset: 49 at cycle number: 1716
5,5,2,12 Subset: 50 at cycle number: 1716

5,5,12,2 Subset: 51 at cycle number: 1716
2,1,2,2,5,12 Subset: 52 at cycle number: 1716
9,2,12,1 Subset: 53 at cycle number: 1716
2,9,1,5,2,5 Subset: 54 at cycle number: 1716
5,2,12,5 Subset: 55 at cycle number: 1716
1,1,2,1,5,2,12 Subset: 56 at cycle number: 1716

COMBINATIONS (WITH REPLACEMENT)

$C^R(n+r) = (n+r-1)! / r!(n-1)!$

$C^R(6,8) = 13! / 8!(5)!$

Combinations: 1287

*****INITIAL VALUE OF CYCLES: 0

*****NEW VALUE CYCLES: 1287

*****RUNNING TOTAL CYCLES: 3003

***PROCESSING SET AT INDEX: 56

ENDING AT INDEX:*** 107

9,1,12,2 Subset: 57 at cycle number: 3003
5,2,5,2,5,5 Subset: 58 at cycle number: 3003
5,1,5,2,2,9 Subset: 59 at cycle number: 3003
1,9,9,5 Subset: 60 at cycle number: 3003
2,5,9,2,5,1 Subset: 61 at cycle number: 3003
1,2,9,12 Subset: 62 at cycle number: 3003
5,1,2,9,2,5 Subset: 63 at cycle number: 3003
9,12,1,2 Subset: 64 at cycle number: 3003
1,1,9,9,2,2 Subset: 65 at cycle number: 3003
1,5,1,5,12 Subset: 66 at cycle number: 3003
5,12,1,5,1 Subset: 67 at cycle number: 3003
2,1,5,12,2,2 Subset: 68 at cycle number: 3003
2,5,5,1,2,9 Subset: 69 at cycle number: 3003
2,9,9,2,1,1 Subset: 70 at cycle number: 3003
9,1,2,5,5,2 Subset: 71 at cycle number: 3003
9,5,1,2,2,5 Subset: 72 at cycle number: 3003
12,2,1,9 Subset: 73 at cycle number: 3003
9,1,9,5 Subset: 74 at cycle number: 3003
2,5,5,12 Subset: 75 at cycle number: 3003
2,2,9,9,2 Subset: 76 at cycle number: 3003
1,12,9,2 Subset: 77 at cycle number: 3003
5,2,1,1,12,1,2 Subset: 78 at cycle number: 3003
2,1,2,5,12,2 Subset: 79 at cycle number: 3003
2,2,1,5,9,5 Subset: 80 at cycle number: 3003
2,9,2,9,2 Subset: 81 at cycle number: 3003
12,2,2,5,2,1 Subset: 82 at cycle number: 3003
12,1,1,2,2,5,1 Subset: 83 at cycle number: 3003
2,1,9,12 Subset: 84 at cycle number: 3003
2,5,1,2,5,9 Subset: 85 at cycle number: 3003
1,1,1,12,1,1,5,2 Subset: 86 at cycle number: 3003
2,1,12,2,2,5 Subset: 87 at cycle number: 3003
5,2,5,1,9,2 Subset: 88 at cycle number: 3003

9,2,2,2,2,5 Subset: 89 at cycle number: 3003
 2,1,5,9,2,5 Subset: 90 at cycle number: 3003
 5,2,1,2,5,9 Subset: 91 at cycle number: 3003
 1,1,12,1,9 Subset: 92 at cycle number: 3003
 9,2,5,2,2,2,2 Subset: 93 at cycle number: 3003
 1,9,1,1,12 Subset: 94 at cycle number: 3003
 5,9,9,1 Subset: 95 at cycle number: 3003
 1,12,5,5,1 Subset: 96 at cycle number: 3003
 1,9,12,2 Subset: 97 at cycle number: 3003
 5,5,1,12,1 Subset: 98 at cycle number: 3003
 1,2,2,5,2,12 Subset: 99 at cycle number: 3003
 9,2,2,9,1,1 Subset: 100 at cycle number: 3003
 1,1,5,1,9,2,5 Subset: 101 at cycle number: 3003
 12,5,2,5 Subset: 102 at cycle number: 3003
 2,1,2,2,2,1,5,9 Subset: 103 at cycle number: 3003
 2,5,1,1,9,5,1 Subset: 104 at cycle number: 3003
 9,1,1,1,12 Subset: 105 at cycle number: 3003
 2,1,5,2,5,9 Subset: 106 at cycle number: 3003
 12,1,5,1,5 Subset: 107 at cycle number: 3003

COMBINATIONS (WITH REPLACEMENT)

$C^R(n + r) = (n+r-1)! / r!(n-1)!$

$C^R(6,9) = 14! / 9!(5)!$

Combinations: 2002

*****INITIAL VALUE OF CYCLES: 0

*****NEW VALUE CYCLES: 2002

*****RUNNING TOTAL CYCLES: 5005

***PROCESSING SET AT INDEX: 107

ENDING AT INDEX:*** 148

2,2,5,12,1,2 Subset: 108 at cycle number: 5005
 5,5,1,5,1,2,5 Subset: 109 at cycle number: 5005
 9,1,9,2,1,2 Subset: 110 at cycle number: 5005
 12,2,1,2,2,5 Subset: 111 at cycle number: 5005
 12,5,1,1,5 Subset: 112 at cycle number: 5005
 5,1,12,2,2,1,1 Subset: 113 at cycle number: 5005
 1,2,9,2,9,1 Subset: 114 at cycle number: 5005
 2,9,9,2,2 Subset: 115 at cycle number: 5005
 1,9,2,12 Subset: 116 at cycle number: 5005
 5,1,2,12,2,2 Subset: 117 at cycle number: 5005
 2,1,5,1,12,1,2 Subset: 118 at cycle number: 5005
 1,5,1,12,5 Subset: 119 at cycle number: 5005
 12,5,5,1,1 Subset: 120 at cycle number: 5005
 9,1,1,1,5,5,1,1 Subset: 121 at cycle number: 5005
 5,1,1,1,12,1,1,2 Subset: 122 at cycle number: 5005
 2,5,5,1,9,2 Subset: 123 at cycle number: 5005
 1,1,5,5,12 Subset: 124 at cycle number: 5005
 12,9,1,1,1 Subset: 125 at cycle number: 5005
 5,1,2,5,1,5,5 Subset: 126 at cycle number: 5005

2,2,1,2,5,12 Subset: 127 at cycle number: 5005
 9,1,2,12 Subset: 128 at cycle number: 5005
 9,5,5,2,2,1 Subset: 129 at cycle number: 5005
 9,1,9,1,2,1,1 Subset: 130 at cycle number: 5005
 2,2,9,1,1,9 Subset: 131 at cycle number: 5005
 2,2,1,9,2,1,5,2 Subset: 132 at cycle number: 5005
 5,2,9,2,1,5 Subset: 133 at cycle number: 5005
 1,1,9,12,1 Subset: 134 at cycle number: 5005
 9,2,5,2,5,1 Subset: 135 at cycle number: 5005
 5,5,2,1,2,9 Subset: 136 at cycle number: 5005
 2,5,2,1,9,2,2,1 Subset: 137 at cycle number: 5005
 9,9,1,5 Subset: 138 at cycle number: 5005
 1,5,5,1,2,5,5 Subset: 139 at cycle number: 5005
 12,1,9,2 Subset: 140 at cycle number: 5005
 1,1,5,5,2,1,9 Subset: 141 at cycle number: 5005
 1,12,1,9,1 Subset: 142 at cycle number: 5005
 2,1,5,2,9,5 Subset: 143 at cycle number: 5005
 2,1,9,5,2,5 Subset: 144 at cycle number: 5005
 5,1,12,1,5 Subset: 145 at cycle number: 5005
 5,2,2,2,12,1 Subset: 146 at cycle number: 5005
 9,2,5,1,2,5 Subset: 147 at cycle number: 5005
 9,1,5,1,5,2,1 Subset: 148 at cycle number: 5005

COMBINATIONS (WITH REPLACEMENT)

$C^R(n + r) = (n+r-1)! / r!(n-1)!$

$C^R(6,10) = 15! / 10!(5)!$

Combinations: 3003

*****INITIAL VALUE OF CYCLES: 0

*****NEW VALUE CYCLES: 3003

*****RUNNING TOTAL CYCLES: 8008

***PROCESSING SET AT INDEX: 148

ENDING AT INDEX:*** 203

9,9,2,2,2 Subset: 149 at cycle number: 8008
 2,1,2,12,1,2,2,1,1 Subset: 150 at cycle number: 8008
 1,2,5,5,9,2 Subset: 151 at cycle number: 8008
 5,2,1,5,9,2 Subset: 152 at cycle number: 8008
 2,1,2,9,1,9 Subset: 153 at cycle number: 8008
 5,1,5,9,2,2 Subset: 154 at cycle number: 8008
 1,1,12,1,2,1,2,2,1,1 Subset: 155 at cycle number: 8008
 2,9,2,9,1,1 Subset: 156 at cycle number: 8008
 1,12,2,5,2,2 Subset: 157 at cycle number: 8008
 5,9,1,2,5,2 Subset: 158 at cycle number: 8008
 2,5,1,5,9,1,1 Subset: 159 at cycle number: 8008
 1,9,2,5,2,5 Subset: 160 at cycle number: 8008
 2,5,1,5,9,2 Subset: 161 at cycle number: 8008
 1,1,5,2,1,1,2,1,9,1 Subset: 162 at cycle number: 8008
 5,9,2,1,2,5 Subset: 163 at cycle number: 8008
 12,1,1,5,5 Subset: 164 at cycle number: 8008

5,12,1,2,2,1,1 Subset: 165 at cycle number: 8008
 1,1,2,12,2,1,5 Subset: 166 at cycle number: 8008
 5,5,2,5,5,2 Subset: 167 at cycle number: 8008
 9,1,9,2,1,1,1 Subset: 168 at cycle number: 8008
 5,2,2,12,2,1 Subset: 169 at cycle number: 8008
 2,5,1,5,1,1,9 Subset: 170 at cycle number: 8008
 5,1,2,5,2,9 Subset: 171 at cycle number: 8008
 1,1,5,9,5,2,1 Subset: 172 at cycle number: 8008
 1,9,9,2,2,1 Subset: 173 at cycle number: 8008
 5,9,2,5,2,1 Subset: 174 at cycle number: 8008
 1,12,1,5,5 Subset: 175 at cycle number: 8008
 2,2,1,5,12,2 Subset: 176 at cycle number: 8008
 2,5,12,2,1,2 Subset: 177 at cycle number: 8008
 1,2,2,12,5,1,1 Subset: 178 at cycle number: 8008
 2,1,2,2,12,5 Subset: 179 at cycle number: 8008
 1,2,5,1,2,1,12 Subset: 180 at cycle number: 8008
 1,2,12,5,2,2 Subset: 181 at cycle number: 8008
 12,1,2,2,5,2 Subset: 182 at cycle number: 8008
 1,1,9,1,12 Subset: 183 at cycle number: 8008
 9,2,1,1,2,9 Subset: 184 at cycle number: 8008
 5,5,2,2,5,5 Subset: 185 at cycle number: 8008
 2,9,1,2,9,1 Subset: 186 at cycle number: 8008
 2,1,2,12,2,5 Subset: 187 at cycle number: 8008
 2,9,1,1,1,2,1,5,2 Subset: 188 at cycle number: 8008
 1,9,1,1,2,1,2,5,2 Subset: 189 at cycle number: 8008
 2,2,2,1,5,12 Subset: 190 at cycle number: 8008
 9,5,2,2,1,5 Subset: 191 at cycle number: 8008
 5,1,5,1,12 Subset: 192 at cycle number: 8008
 1,1,1,9,12 Subset: 193 at cycle number: 8008
 5,1,1,12,5 Subset: 194 at cycle number: 8008
 5,1,1,5,12 Subset: 195 at cycle number: 8008
 12,1,9,1,1 Subset: 196 at cycle number: 8008
 2,2,5,5,1,9 Subset: 197 at cycle number: 8008
 1,2,1,9,9,2 Subset: 198 at cycle number: 8008
 1,2,2,12,5,2 Subset: 199 at cycle number: 8008
 2,5,5,2,5,5 Subset: 200 at cycle number: 8008
 1,2,2,9,1,9 Subset: 201 at cycle number: 8008
 12,2,1,1,5,1,1,1 Subset: 202 at cycle number: 8008
 5,5,2,5,2,5 Subset: 203 at cycle number: 8008

COMBINATIONS (WITH REPLACEMENT)

$C^R(n + r) = (n+r-1)! / r!(n-1)!$

$C^R(6,11) = 16! / 11!(5)!$

Combinations: 4368

*****INITIAL VALUE OF CYCLES: 0

*****NEW VALUE CYCLES: 4368

*****RUNNING TOTAL CYCLES: 12376

***PROCESSING SET AT INDEX: 203

****ENDING AT INDEX:***** 283**

9,2,1,2,5,5 Subset: 204 at cycle number: 12376
9,1,1,12,1 Subset: 205 at cycle number: 12376
2,1,5,2,12,2 Subset: 206 at cycle number: 12376
5,2,12,1,2,2 Subset: 207 at cycle number: 12376
12,2,5,1,2,2 Subset: 208 at cycle number: 12376
9,2,2,1,1,9 Subset: 209 at cycle number: 12376
5,12,1,1,5 Subset: 210 at cycle number: 12376
2,12,2,2,5,1 Subset: 211 at cycle number: 12376
1,2,1,1,12,1,1,5 Subset: 212 at cycle number: 12376
2,1,9,9,2,1 Subset: 213 at cycle number: 12376
12,1,2,1,1,2,5 Subset: 214 at cycle number: 12376
2,2,5,1,9,5 Subset: 215 at cycle number: 12376
9,2,5,1,5,2 Subset: 216 at cycle number: 12376
1,5,5,2,9,2 Subset: 217 at cycle number: 12376
9,2,2,9,2 Subset: 218 at cycle number: 12376
5,1,2,9,5,2 Subset: 219 at cycle number: 12376
1,5,1,2,2,9,2,2 Subset: 220 at cycle number: 12376
1,9,5,5,1,2,1 Subset: 221 at cycle number: 12376
1,2,12,5,1,2,1 Subset: 222 at cycle number: 12376
1,5,5,9,1,2,1 Subset: 223 at cycle number: 12376
2,9,2,2,5,1,1,2 Subset: 224 at cycle number: 12376
2,5,1,2,9,5 Subset: 225 at cycle number: 12376
9,2,5,5,2,1 Subset: 226 at cycle number: 12376
9,2,2,2,9 Subset: 227 at cycle number: 12376
1,1,5,2,12,1,2 Subset: 228 at cycle number: 12376
12,2,2,2,2,2,2 Subset: 229 at cycle number: 12376
1,1,12,5,5 Subset: 230 at cycle number: 12376
2,2,12,5,2,1 Subset: 231 at cycle number: 12376
2,5,2,2,1,9,1,2 Subset: 232 at cycle number: 12376
5,5,12,1,1 Subset: 233 at cycle number: 12376
5,1,5,2,9,2 Subset: 234 at cycle number: 12376
5,9,1,5,2,2 Subset: 235 at cycle number: 12376
9,1,1,5,2,2,2,2 Subset: 236 at cycle number: 12376
1,2,9,9,2,1 Subset: 237 at cycle number: 12376
9,2,2,2,5,1,1,2 Subset: 238 at cycle number: 12376
2,2,12,1,2,5 Subset: 239 at cycle number: 12376
9,1,2,2,1,9 Subset: 240 at cycle number: 12376
5,1,12,5,1 Subset: 241 at cycle number: 12376
12,1,5,5,1 Subset: 242 at cycle number: 12376
12,2,2,2,1,5 Subset: 243 at cycle number: 12376
9,1,1,1,2,5,2,2,1 Subset: 244 at cycle number: 12376
2,9,1,9,2,1 Subset: 245 at cycle number: 12376
1,5,5,1,1,2,1,1,2,5 Subset: 246 at cycle number: 12376
2,1,9,2,5,5 Subset: 247 at cycle number: 12376
1,5,5,12,1 Subset: 248 at cycle number: 12376
5,2,5,9,1,2 Subset: 249 at cycle number: 12376
2,2,5,2,1,12 Subset: 250 at cycle number: 12376

2,9,2,2,9 Subset: 251 at cycle number: 12376
 1,5,12,2,2,2 Subset: 252 at cycle number: 12376
 2,5,2,5,1,9 Subset: 253 at cycle number: 12376
 2,12,1,1,5,1,2 Subset: 254 at cycle number: 12376
 1,1,2,2,12,5,1 Subset: 255 at cycle number: 12376
 2,12,2,1,5,2 Subset: 256 at cycle number: 12376
 9,5,1,5,2,2 Subset: 257 at cycle number: 12376
 5,5,1,1,12 Subset: 258 at cycle number: 12376
 5,1,9,1,2,1,5 Subset: 259 at cycle number: 12376
 2,2,2,9,9 Subset: 260 at cycle number: 12376
 1,12,1,1,5,2,2 Subset: 261 at cycle number: 12376
 5,1,1,2,1,12,2 Subset: 262 at cycle number: 12376
 9,1,2,5,2,5 Subset: 263 at cycle number: 12376
 5,2,9,5,1,2 Subset: 264 at cycle number: 12376
 5,2,2,5,2,5,1,2 Subset: 265 at cycle number: 12376
 1,5,12,5,1 Subset: 266 at cycle number: 12376
 2,1,12,2,1,1,5 Subset: 267 at cycle number: 12376
 1,2,2,5,1,1,12 Subset: 268 at cycle number: 12376
 1,1,12,9,1 Subset: 269 at cycle number: 12376
 1,12,5,1,5 Subset: 270 at cycle number: 12376
 5,2,1,1,2,12,1 Subset: 271 at cycle number: 12376
 5,2,9,2,5,1 Subset: 272 at cycle number: 12376
 1,1,1,5,5,9,2 Subset: 273 at cycle number: 12376
 12,1,1,1,9 Subset: 274 at cycle number: 12376
 1,9,5,2,2,5 Subset: 275 at cycle number: 12376
 5,9,1,2,2,5 Subset: 276 at cycle number: 12376
 2,1,1,12,5,2,1 Subset: 277 at cycle number: 12376
 5,1,9,5,2,2 Subset: 278 at cycle number: 12376
 1,1,1,9,5,2,5 Subset: 279 at cycle number: 12376
 9,2,1,5,5,2 Subset: 280 at cycle number: 12376
 2,1,1,9,2,9 Subset: 281 at cycle number: 12376
 5,2,12,2,1,2 Subset: 282 at cycle number: 12376
 5,12,1,2,2,2 Subset: 283 at cycle number: 12376

COMBINATIONS (WITH REPLACEMENT)

$C^R(n + r) = (n+r-1)! / r!(n-1)!$

$C^R(6,12) = 17! / 12!(5)!$

Combinations: 6188

*****INITIAL VALUE OF CYCLES: 0

*****NEW VALUE CYCLES: 6188

*****RUNNING TOTAL CYCLES: 18564

***PROCESSING SET AT INDEX: 283

ENDING AT INDEX:*** 364

2,1,1,9,5,1,5 Subset: 284 at cycle number: 18564
 5,9,1,1,1,2,5 Subset: 285 at cycle number: 18564
 1,12,2,1,5,2,1 Subset: 286 at cycle number: 18564
 2,2,5,1,12,2 Subset: 287 at cycle number: 18564
 1,5,1,12,2,2,1 Subset: 288 at cycle number: 18564

2,5,2,1,2,12 Subset: 289 at cycle number: 18564
5,2,9,1,1,5,1 Subset: 290 at cycle number: 18564
1,2,1,9,1,1,9 Subset: 291 at cycle number: 18564
5,2,9,1,5,2 Subset: 292 at cycle number: 18564
1,2,9,2,5,5 Subset: 293 at cycle number: 18564
1,1,9,2,2,9 Subset: 294 at cycle number: 18564
2,1,2,5,9,5 Subset: 295 at cycle number: 18564
2,1,2,9,9,1 Subset: 296 at cycle number: 18564
5,1,5,1,2,1,9 Subset: 297 at cycle number: 18564
1,1,2,5,1,2,12 Subset: 298 at cycle number: 18564
1,5,9,1,5,2,1 Subset: 299 at cycle number: 18564
1,9,1,2,5,1,5 Subset: 300 at cycle number: 18564
2,1,5,1,9,1,5 Subset: 301 at cycle number: 18564
5,5,2,2,1,9 Subset: 302 at cycle number: 18564
12,2,5,2,1,2 Subset: 303 at cycle number: 18564
5,1,1,5,5,2,5 Subset: 304 at cycle number: 18564
5,2,2,1,5,9 Subset: 305 at cycle number: 18564
1,2,9,1,9,2 Subset: 306 at cycle number: 18564
5,5,1,2,2,9 Subset: 307 at cycle number: 18564
2,5,9,1,5,2 Subset: 308 at cycle number: 18564
2,5,12,1,2,2 Subset: 309 at cycle number: 18564
2,1,1,5,12,2,1 Subset: 310 at cycle number: 18564
9,2,5,2,1,5 Subset: 311 at cycle number: 18564
2,2,12,2,1,5 Subset: 312 at cycle number: 18564
1,9,2,9,1,2 Subset: 313 at cycle number: 18564
1,2,2,9,1,2,5,2 Subset: 314 at cycle number: 18564
2,1,1,9,1,1,9 Subset: 315 at cycle number: 18564
2,2,2,1,2,9,1,5 Subset: 316 at cycle number: 18564
1,12,2,2,1,1,5 Subset: 317 at cycle number: 18564
1,5,5,1,12 Subset: 318 at cycle number: 18564
1,5,2,2,9,5 Subset: 319 at cycle number: 18564
5,1,2,2,2,2,5,5 Subset: 320 at cycle number: 18564
1,1,5,12,5 Subset: 321 at cycle number: 18564
1,5,2,5,9,2 Subset: 322 at cycle number: 18564
12,1,2,1,1,1,1,5 Subset: 323 at cycle number: 18564
9,9,2,1,1,2 Subset: 324 at cycle number: 18564
2,5,9,5,2,1 Subset: 325 at cycle number: 18564
1,5,9,1,2,5,1 Subset: 326 at cycle number: 18564
5,5,1,2,1,1,9 Subset: 327 at cycle number: 18564
9,2,1,9,2,1 Subset: 328 at cycle number: 18564
1,2,2,9,2,1,5,2 Subset: 329 at cycle number: 18564
12,1,1,1,5,2,2 Subset: 330 at cycle number: 18564
2,5,2,5,9,1 Subset: 331 at cycle number: 18564
1,1,2,5,9,1,5 Subset: 332 at cycle number: 18564
9,1,2,1,2,9 Subset: 333 at cycle number: 18564
2,5,5,2,1,2,1,5,1 Subset: 334 at cycle number: 18564
2,1,1,2,2,5,2,9 Subset: 335 at cycle number: 18564
5,2,1,1,1,9,5 Subset: 336 at cycle number: 18564

1,1,9,1,2,1,9 Subset: 337 at cycle number: 18564
 2,12,2,5,2,1 Subset: 338 at cycle number: 18564
 9,1,2,5,1,2,2,2 Subset: 339 at cycle number: 18564
 9,1,12,1,1 Subset: 340 at cycle number: 18564
 2,9,5,5,2,1 Subset: 341 at cycle number: 18564
 2,2,1,9,5,5 Subset: 342 at cycle number: 18564
 2,9,1,2,1,9 Subset: 343 at cycle number: 18564
 9,1,2,9,1,1,1 Subset: 344 at cycle number: 18564
 5,2,5,5,5,1,1 Subset: 345 at cycle number: 18564
 9,1,2,9,2,1 Subset: 346 at cycle number: 18564
 2,1,5,5,5,1,5 Subset: 347 at cycle number: 18564
 2,12,5,1,2,2 Subset: 348 at cycle number: 18564
 2,1,5,2,2,12 Subset: 349 at cycle number: 18564
 2,1,2,1,1,12,5 Subset: 350 at cycle number: 18564
 1,5,1,2,2,12,1 Subset: 351 at cycle number: 18564
 1,5,1,1,5,9,2 Subset: 352 at cycle number: 18564
 12,1,1,9,1 Subset: 353 at cycle number: 18564
 5,5,1,1,1,1,1,9 Subset: 354 at cycle number: 18564
 2,2,2,5,12,1 Subset: 355 at cycle number: 18564
 5,2,2,2,2,1,1,9 Subset: 356 at cycle number: 18564
 2,2,2,2,1,2,12,1 Subset: 357 at cycle number: 18564
 1,5,1,2,9,1,5 Subset: 358 at cycle number: 18564
 1,1,1,2,12,1,5,1 Subset: 359 at cycle number: 18564
 2,5,9,1,2,5 Subset: 360 at cycle number: 18564
 12,2,1,2,5,2 Subset: 361 at cycle number: 18564
 2,12,1,2,5,2 Subset: 362 at cycle number: 18564
 1,12,1,1,9 Subset: 363 at cycle number: 18564
 1,1,5,1,12,1,1,2 Subset: 364 at cycle number: 18564

COMBINATIONS (WITH REPLACEMENT)

$C^R(n + r) = (n+r-1)! / r!(n-1)!$

$C^R(6,13) = 18! / 13!(5)!$

Combinations: 8568

*****INITIAL VALUE OF CYCLES: 0

*****NEW VALUE CYCLES: 8568

*****RUNNING TOTAL CYCLES: 27132

***PROCESSING SET AT INDEX: 364

ENDING AT INDEX:*** 441

1,5,5,2,2,5,2,1,1 Subset: 365 at cycle number: 27132
 2,1,9,2,1,9 Subset: 366 at cycle number: 27132
 2,2,12,1,5,2 Subset: 367 at cycle number: 27132
 9,5,1,5,1,1,1,1 Subset: 368 at cycle number: 27132
 5,5,1,2,9,2 Subset: 369 at cycle number: 27132
 12,2,2,1,5,2 Subset: 370 at cycle number: 27132
 2,1,2,5,5,2,2,5 Subset: 371 at cycle number: 27132
 2,12,1,2,2,5 Subset: 372 at cycle number: 27132
 2,1,9,1,2,9 Subset: 373 at cycle number: 27132
 9,9,1,1,2,2 Subset: 374 at cycle number: 27132

5,5,1,1,1,2,9 Subset: 375 at cycle number: 27132
1,2,5,12,1,1,2 Subset: 376 at cycle number: 27132
2,2,1,12,2,5 Subset: 377 at cycle number: 27132
2,2,5,2,12,1 Subset: 378 at cycle number: 27132
9,1,2,5,5,1,1 Subset: 379 at cycle number: 27132
1,5,2,2,1,1,9,2,1 Subset: 380 at cycle number: 27132
9,9,1,2,1,2 Subset: 381 at cycle number: 27132
1,2,1,2,9,9 Subset: 382 at cycle number: 27132
1,1,2,2,1,12,5 Subset: 383 at cycle number: 27132
2,5,9,2,1,5 Subset: 384 at cycle number: 27132
2,1,1,1,9,1,9 Subset: 385 at cycle number: 27132
1,2,1,1,2,5,12 Subset: 386 at cycle number: 27132
5,1,5,1,1,1,1,9 Subset: 387 at cycle number: 27132
5,2,5,1,2,9 Subset: 388 at cycle number: 27132
2,1,1,2,1,5,12 Subset: 389 at cycle number: 27132
1,5,2,2,2,12 Subset: 390 at cycle number: 27132
1,9,1,9,2,2 Subset: 391 at cycle number: 27132
2,2,12,5,1,2 Subset: 392 at cycle number: 27132
2,5,2,9,1,5 Subset: 393 at cycle number: 27132
2,2,1,5,2,1,2,9 Subset: 394 at cycle number: 27132
1,2,5,2,9,5 Subset: 395 at cycle number: 27132
2,2,9,2,5,1,1,2 Subset: 396 at cycle number: 27132
5,1,5,1,9,2,1 Subset: 397 at cycle number: 27132
2,5,1,1,12,1,2 Subset: 398 at cycle number: 27132
5,2,1,2,2,12 Subset: 399 at cycle number: 27132
5,2,9,2,2,1,1,2 Subset: 400 at cycle number: 27132
1,5,2,12,1,1,2 Subset: 401 at cycle number: 27132
1,2,9,5,5,2 Subset: 402 at cycle number: 27132
2,5,5,9,1,2 Subset: 403 at cycle number: 27132
5,9,1,1,5,1,2 Subset: 404 at cycle number: 27132
5,1,2,1,12,1,2 Subset: 405 at cycle number: 27132
5,9,2,2,5,1 Subset: 406 at cycle number: 27132
12,2,2,1,1,1,5 Subset: 407 at cycle number: 27132
2,2,9,2,2,5,2 Subset: 408 at cycle number: 27132
9,5,2,5,1,2 Subset: 409 at cycle number: 27132
1,12,9,1,1 Subset: 410 at cycle number: 27132
2,9,1,2,5,5 Subset: 411 at cycle number: 27132
12,1,5,2,2,1,1 Subset: 412 at cycle number: 27132
1,1,5,1,2,9,5 Subset: 413 at cycle number: 27132
2,2,1,12,5,1,1 Subset: 414 at cycle number: 27132
1,5,9,1,1,2,5 Subset: 415 at cycle number: 27132
1,2,5,2,5,9 Subset: 416 at cycle number: 27132
5,5,1,1,5,5,2 Subset: 417 at cycle number: 27132
5,2,9,5,2,1 Subset: 418 at cycle number: 27132
5,2,2,2,2,1,5,5 Subset: 419 at cycle number: 27132
1,2,2,2,2,5,5,5 Subset: 420 at cycle number: 27132
12,1,1,5,2,1,2 Subset: 421 at cycle number: 27132
5,5,5,2,5,2 Subset: 422 at cycle number: 27132

1,5,2,2,12,1,1 Subset: 423 at cycle number: 27132
 2,9,5,5,1,2 Subset: 424 at cycle number: 27132
 9,2,2,1,5,5 Subset: 425 at cycle number: 27132
 2,5,1,9,5,2 Subset: 426 at cycle number: 27132
 2,5,9,5,1,2 Subset: 427 at cycle number: 27132
 1,2,5,9,5,2 Subset: 428 at cycle number: 27132
 2,2,5,9,1,5 Subset: 429 at cycle number: 27132
 5,2,1,2,9,5 Subset: 430 at cycle number: 27132
 5,2,2,1,2,12 Subset: 431 at cycle number: 27132
 1,1,2,1,12,2,5 Subset: 432 at cycle number: 27132
 1,5,2,1,12,1,2 Subset: 433 at cycle number: 27132
 1,5,2,5,9,1,1 Subset: 434 at cycle number: 27132
 1,12,2,2,2,5 Subset: 435 at cycle number: 27132
 2,2,5,12,2,1 Subset: 436 at cycle number: 27132
 2,1,5,9,5,2 Subset: 437 at cycle number: 27132
 5,2,5,5,5,2 Subset: 438 at cycle number: 27132
 5,12,5,1,1 Subset: 439 at cycle number: 27132
 2,1,1,9,2,5,2,2 Subset: 440 at cycle number: 27132
 1,2,1,9,5,1,5 Subset: 441 at cycle number: 27132

COMBINATIONS (WITH REPLACEMENT)

$C^R(n + r) = (n+r-1)! / r!(n-1)!$

$C^R(6,14) = 19! / 14!(5)!$

Combinations: 11628

*****INITIAL VALUE OF CYCLES: 0

*****NEW VALUE CYCLES: 11628

*****RUNNING TOTAL CYCLES: 38760

***PROCESSING SET AT INDEX: 441

ENDING AT INDEX:*** 544

1,9,1,1,1,2,9 Subset: 442 at cycle number: 38760
 1,2,12,1,1,5,2 Subset: 443 at cycle number: 38760
 2,2,1,2,1,2,1,2,1,1,9 Subset: 444 at cycle number: 38760
 9,9,1,2,2,1 Subset: 445 at cycle number: 38760
 1,12,2,2,2,2,1,2 Subset: 446 at cycle number: 38760
 1,5,9,2,1,5,1 Subset: 447 at cycle number: 38760
 2,5,2,1,2,2,9,1 Subset: 448 at cycle number: 38760
 1,12,1,2,1,1,1,5 Subset: 449 at cycle number: 38760
 1,2,1,5,9,1,5 Subset: 450 at cycle number: 38760
 1,2,2,2,5,12 Subset: 451 at cycle number: 38760
 2,2,1,9,1,9 Subset: 452 at cycle number: 38760
 2,1,9,9,1,2 Subset: 453 at cycle number: 38760
 5,12,2,1,2,2 Subset: 454 at cycle number: 38760
 9,1,2,5,2,2,2,1 Subset: 455 at cycle number: 38760
 1,9,2,9,2,1 Subset: 456 at cycle number: 38760
 5,2,12,1,2,1,1 Subset: 457 at cycle number: 38760
 2,2,1,1,1,5,9,2,1 Subset: 458 at cycle number: 38760
 5,5,9,2,1,2 Subset: 459 at cycle number: 38760
 1,1,2,2,9,2,2,5 Subset: 460 at cycle number: 38760

2,5,1,5,1,2,1,5,2 Subset: 461 at cycle number: 38760
9,1,2,1,9,1,1 Subset: 462 at cycle number: 38760
5,1,9,1,5,2,1 Subset: 463 at cycle number: 38760
1,2,1,12,1,2,5 Subset: 464 at cycle number: 38760
1,9,2,2,5,2,1,2 Subset: 465 at cycle number: 38760
5,2,9,1,2,5 Subset: 466 at cycle number: 38760
1,1,9,2,9,2 Subset: 467 at cycle number: 38760
5,12,1,2,1,1,2 Subset: 468 at cycle number: 38760
5,1,9,1,1,2,5 Subset: 469 at cycle number: 38760
1,9,1,1,1,1,5,5 Subset: 470 at cycle number: 38760
1,2,2,5,12,2 Subset: 471 at cycle number: 38760
12,2,2,5,1,2 Subset: 472 at cycle number: 38760
1,1,5,9,1,5,1,1 Subset: 473 at cycle number: 38760
1,5,9,2,2,5 Subset: 474 at cycle number: 38760
2,5,5,5,5,2 Subset: 475 at cycle number: 38760
2,1,9,1,5,1,5 Subset: 476 at cycle number: 38760
2,1,1,2,9,9 Subset: 477 at cycle number: 38760
2,1,5,2,5,2,2,5 Subset: 478 at cycle number: 38760
1,5,1,1,5,1,9,1 Subset: 479 at cycle number: 38760
9,1,1,1,9,1,2 Subset: 480 at cycle number: 38760
1,5,2,1,1,2,1,9,2 Subset: 481 at cycle number: 38760
1,1,2,12,1,2,1,1,2,1 Subset: 482 at cycle number: 38760
9,1,1,2,5,5,1 Subset: 483 at cycle number: 38760
2,2,9,1,9,1 Subset: 484 at cycle number: 38760
2,1,9,5,5,2 Subset: 485 at cycle number: 38760
2,2,12,2,5,1 Subset: 486 at cycle number: 38760
1,1,2,2,9,9 Subset: 487 at cycle number: 38760
1,5,5,1,2,9,1 Subset: 488 at cycle number: 38760
12,2,2,1,5,1,1 Subset: 489 at cycle number: 38760
1,2,2,9,9,1 Subset: 490 at cycle number: 38760
1,12,2,2,1,5,1 Subset: 491 at cycle number: 38760
9,2,2,2,5,2,2 Subset: 492 at cycle number: 38760
1,2,5,2,12,2 Subset: 493 at cycle number: 38760
1,2,1,9,2,9 Subset: 494 at cycle number: 38760
2,9,2,1,1,9 Subset: 495 at cycle number: 38760
5,1,1,2,2,12,1 Subset: 496 at cycle number: 38760
5,1,2,12,1,1,2 Subset: 497 at cycle number: 38760
1,1,1,5,9,2,5 Subset: 498 at cycle number: 38760
1,2,12,2,5,2 Subset: 499 at cycle number: 38760
1,1,2,1,2,1,2,5,9 Subset: 500 at cycle number: 38760
2,1,12,5,2,2 Subset: 501 at cycle number: 38760
9,1,2,2,2,2,2,2,2 Subset: 502 at cycle number: 38760
5,2,1,12,2,2 Subset: 503 at cycle number: 38760
1,9,1,1,5,1,5,1 Subset: 504 at cycle number: 38760
9,1,2,1,5,1,5 Subset: 505 at cycle number: 38760
5,1,2,1,2,12,1 Subset: 506 at cycle number: 38760
1,2,2,1,1,12,5 Subset: 507 at cycle number: 38760
2,5,2,2,1,12 Subset: 508 at cycle number: 38760

5,5,9,1,1,2,1 Subset: 509 at cycle number: 38760
 5,2,1,5,5,1,5 Subset: 510 at cycle number: 38760
 1,12,1,2,2,1,5 Subset: 511 at cycle number: 38760
 2,5,2,1,12,2 Subset: 512 at cycle number: 38760
 5,1,9,2,2,5 Subset: 513 at cycle number: 38760
 2,1,1,5,5,9,1 Subset: 514 at cycle number: 38760
 5,9,5,1,2,2 Subset: 515 at cycle number: 38760
 1,9,5,2,1,1,5 Subset: 516 at cycle number: 38760
 2,2,5,5,5,5 Subset: 517 at cycle number: 38760
 5,5,1,1,2,9,1 Subset: 518 at cycle number: 38760
 5,2,5,9,2,1 Subset: 519 at cycle number: 38760
 2,1,2,1,5,1,12 Subset: 520 at cycle number: 38760
 2,5,2,1,9,5 Subset: 521 at cycle number: 38760
 1,9,1,9,1,2,1 Subset: 522 at cycle number: 38760
 2,5,2,2,1,9,2,1 Subset: 523 at cycle number: 38760
 5,1,5,9,1,1,2 Subset: 524 at cycle number: 38760
 2,2,9,9,1,1 Subset: 525 at cycle number: 38760
 2,1,2,9,5,5 Subset: 526 at cycle number: 38760
 2,2,12,1,1,1,5 Subset: 527 at cycle number: 38760
 9,12,1,1,1 Subset: 528 at cycle number: 38760
 1,1,9,2,9,1,1 Subset: 529 at cycle number: 38760
 2,1,9,5,1,1,5 Subset: 530 at cycle number: 38760
 2,2,1,5,5,9 Subset: 531 at cycle number: 38760
 5,2,5,1,1,5,5 Subset: 532 at cycle number: 38760
 1,9,1,2,5,5,1 Subset: 533 at cycle number: 38760
 2,5,2,1,5,2,2,5 Subset: 534 at cycle number: 38760
 2,12,1,5,2,2 Subset: 535 at cycle number: 38760
 1,2,5,1,1,2,12 Subset: 536 at cycle number: 38760
 5,2,2,1,9,5 Subset: 537 at cycle number: 38760
 2,1,2,1,2,5,1,5,5 Subset: 538 at cycle number: 38760
 2,12,2,5,1,2 Subset: 539 at cycle number: 38760
 1,2,5,5,1,9,1 Subset: 540 at cycle number: 38760
 1,2,5,9,2,5 Subset: 541 at cycle number: 38760
 1,5,2,2,2,5,5,2 Subset: 542 at cycle number: 38760
 1,2,2,5,9,5 Subset: 543 at cycle number: 38760
 9,1,2,2,5,5 Subset: 544 at cycle number: 38760

COMBINATIONS (WITH REPLACEMENT)

$C^R(n + r) = (n+r-1)! / r!(n-1)!$

$C^R(6,15) = 20! / 15!(5)!$

Combinations: 15504

*****INITIAL VALUE OF CYCLES: 0

*****NEW VALUE CYCLES: 15504

*****RUNNING TOTAL CYCLES: 54264

***PROCESSING SET AT INDEX: 544

ENDING AT INDEX:*** 678

2,2,1,2,5,2,9,1 Subset: 545 at cycle number: 54264

1,2,5,2,2,2,9,1 Subset: 546 at cycle number: 54264

2,9,5,1,5,2 Subset: 547 at cycle number: 54264
9,5,2,1,2,5 Subset: 548 at cycle number: 54264
1,5,5,2,1,9,1 Subset: 549 at cycle number: 54264
2,5,2,5,5,5 Subset: 550 at cycle number: 54264
1,1,2,9,9,2 Subset: 551 at cycle number: 54264
2,2,2,1,1,5,9,2 Subset: 552 at cycle number: 54264
1,1,1,12,5,2,2 Subset: 553 at cycle number: 54264
1,12,5,2,2,2 Subset: 554 at cycle number: 54264
2,9,2,5,1,5 Subset: 555 at cycle number: 54264
9,2,9,1,2,1 Subset: 556 at cycle number: 54264
1,1,1,5,5,2,9 Subset: 557 at cycle number: 54264
1,1,2,2,1,5,12 Subset: 558 at cycle number: 54264
1,2,2,2,12,1,2,2 Subset: 559 at cycle number: 54264
2,2,1,5,2,12 Subset: 560 at cycle number: 54264
2,12,2,5,1,1,1 Subset: 561 at cycle number: 54264
1,5,5,2,2,9 Subset: 562 at cycle number: 54264
12,5,2,2,2,1 Subset: 563 at cycle number: 54264
12,5,2,1,1,1,2 Subset: 564 at cycle number: 54264
1,2,1,5,5,9,1 Subset: 565 at cycle number: 54264
2,9,5,2,5,1 Subset: 566 at cycle number: 54264
9,2,1,1,9,2 Subset: 567 at cycle number: 54264
1,2,1,1,5,12,2 Subset: 568 at cycle number: 54264
1,1,5,2,1,12,2 Subset: 569 at cycle number: 54264
5,2,9,2,1,2,1,2 Subset: 570 at cycle number: 54264
12,2,5,2,2,1 Subset: 571 at cycle number: 54264
1,12,1,2,1,2,2,2,1 Subset: 572 at cycle number: 54264
5,2,2,1,1,12,1 Subset: 573 at cycle number: 54264
5,2,2,5,1,1,2,5,1 Subset: 574 at cycle number: 54264
1,9,5,5,2,2 Subset: 575 at cycle number: 54264
2,1,1,2,1,12,5 Subset: 576 at cycle number: 54264
1,1,1,1,9,2,9 Subset: 577 at cycle number: 54264
2,1,1,1,5,2,5,5,2 Subset: 578 at cycle number: 54264
5,5,5,2,5,1,1 Subset: 579 at cycle number: 54264
2,9,1,2,1,1,5,2,1 Subset: 580 at cycle number: 54264
5,1,2,2,5,2,2,5 Subset: 581 at cycle number: 54264
9,2,1,2,9,1 Subset: 582 at cycle number: 54264
1,2,5,1,1,2,9,2,1 Subset: 583 at cycle number: 54264
1,9,1,2,2,9 Subset: 584 at cycle number: 54264
5,2,2,9,5,1 Subset: 585 at cycle number: 54264
5,1,5,5,2,1,5 Subset: 586 at cycle number: 54264
1,1,9,5,2,5,1 Subset: 587 at cycle number: 54264
5,1,2,1,1,12,2 Subset: 588 at cycle number: 54264
2,1,5,5,2,9 Subset: 589 at cycle number: 54264
9,5,2,1,5,2 Subset: 590 at cycle number: 54264
2,2,2,5,1,1,5,5,1 Subset: 591 at cycle number: 54264
1,1,1,5,2,12,1,1 Subset: 592 at cycle number: 54264
1,2,12,2,2,5 Subset: 593 at cycle number: 54264
5,1,9,2,5,2 Subset: 594 at cycle number: 54264

1,1,1,2,9,1,9 Subset: 595 at cycle number: 54264
2,2,2,1,12,5 Subset: 596 at cycle number: 54264
2,9,5,2,1,5 Subset: 597 at cycle number: 54264
1,2,12,5,1,1,1,1 Subset: 598 at cycle number: 54264
5,1,5,2,1,1,9 Subset: 599 at cycle number: 54264
1,2,1,1,2,12,5 Subset: 600 at cycle number: 54264
5,2,9,2,2,2,2 Subset: 601 at cycle number: 54264
9,1,9,1,2,2 Subset: 602 at cycle number: 54264
1,2,12,5,1,1,2 Subset: 603 at cycle number: 54264
9,1,1,9,2,1,1 Subset: 604 at cycle number: 54264
1,9,5,2,1,5,1 Subset: 605 at cycle number: 54264
1,5,5,1,5,5,2 Subset: 606 at cycle number: 54264
1,1,1,2,5,5,9 Subset: 607 at cycle number: 54264
9,1,2,9,1,2 Subset: 608 at cycle number: 54264
1,2,5,1,9,1,5 Subset: 609 at cycle number: 54264
1,5,5,2,5,5,1 Subset: 610 at cycle number: 54264
1,5,5,9,2,2 Subset: 611 at cycle number: 54264
5,9,2,5,1,1,1 Subset: 612 at cycle number: 54264
12,2,2,2,5,1 Subset: 613 at cycle number: 54264
2,12,5,2,2,1 Subset: 614 at cycle number: 54264
5,1,2,2,12,2 Subset: 615 at cycle number: 54264
2,2,5,2,2,9,2 Subset: 616 at cycle number: 54264
2,1,9,2,9,1 Subset: 617 at cycle number: 54264
5,9,5,2,2,1 Subset: 618 at cycle number: 54264
2,2,5,9,2,1,1,2 Subset: 619 at cycle number: 54264
2,9,1,1,5,1,5 Subset: 620 at cycle number: 54264
1,5,1,2,1,5,9 Subset: 621 at cycle number: 54264
2,1,1,1,2,12,5 Subset: 622 at cycle number: 54264
2,1,2,2,5,1,2,2,5,2 Subset: 623 at cycle number: 54264
9,1,1,9,2,2 Subset: 624 at cycle number: 54264
1,9,5,2,5,2 Subset: 625 at cycle number: 54264
5,2,1,2,5,2,1,1,5 Subset: 626 at cycle number: 54264
1,9,1,9,2,1,1 Subset: 627 at cycle number: 54264
5,2,9,5,1,1,1 Subset: 628 at cycle number: 54264
2,5,2,12,1,1,1 Subset: 629 at cycle number: 54264
2,2,1,9,5,1,2,2 Subset: 630 at cycle number: 54264
2,1,9,5,5,1,1 Subset: 631 at cycle number: 54264
1,5,2,12,2,2 Subset: 632 at cycle number: 54264
2,2,9,1,5,5 Subset: 633 at cycle number: 54264
1,2,5,5,1,5,5 Subset: 634 at cycle number: 54264
1,1,2,5,12,2,1 Subset: 635 at cycle number: 54264
1,5,1,1,2,12,1,1 Subset: 636 at cycle number: 54264
2,1,2,5,9,2,2,1 Subset: 637 at cycle number: 54264
2,5,2,5,5,1,2,1,1 Subset: 638 at cycle number: 54264
2,9,5,1,1,5,1 Subset: 639 at cycle number: 54264
1,2,1,5,1,9,5 Subset: 640 at cycle number: 54264
5,9,5,2,1,2 Subset: 641 at cycle number: 54264
1,5,2,2,1,9,2,2 Subset: 642 at cycle number: 54264

9,1,2,2,9,1 Subset: 643 at cycle number: 54264
 2,2,1,9,2,1,2,5 Subset: 644 at cycle number: 54264
 5,5,1,2,2,2,1,5,1 Subset: 645 at cycle number: 54264
 12,5,1,2,2,1,1 Subset: 646 at cycle number: 54264
 5,2,5,5,2,5 Subset: 647 at cycle number: 54264
 5,1,1,5,5,1,5,1 Subset: 648 at cycle number: 54264
 5,2,1,2,2,2,5,5 Subset: 649 at cycle number: 54264
 5,5,9,1,2,2 Subset: 650 at cycle number: 54264
 1,1,1,9,2,1,1,1,2,5 Subset: 651 at cycle number: 54264
 5,2,1,1,2,1,1,1,1,9 Subset: 652 at cycle number: 54264
 9,1,1,1,1,2,9 Subset: 653 at cycle number: 54264
 1,1,5,5,5,2,5 Subset: 654 at cycle number: 54264
 5,1,1,5,1,9,2 Subset: 655 at cycle number: 54264
 5,2,2,5,5,5 Subset: 656 at cycle number: 54264
 12,1,1,1,1,1,1,5,1 Subset: 657 at cycle number: 54264
 5,1,5,2,2,2,1,1,5 Subset: 658 at cycle number: 54264
 1,2,2,5,2,1,9,2 Subset: 659 at cycle number: 54264
 2,2,2,2,9,5,2 Subset: 660 at cycle number: 54264
 5,1,2,5,1,5,1,2,2 Subset: 661 at cycle number: 54264
 1,9,2,1,5,1,5 Subset: 662 at cycle number: 54264
 1,5,2,1,1,12,2 Subset: 663 at cycle number: 54264
 1,1,9,9,2,1,1 Subset: 664 at cycle number: 54264
 1,1,12,2,1,2,5 Subset: 665 at cycle number: 54264
 2,5,1,2,12,2 Subset: 666 at cycle number: 54264
 2,2,5,5,9,1 Subset: 667 at cycle number: 54264
 1,12,1,5,1,2,2 Subset: 668 at cycle number: 54264
 1,1,12,5,2,1,2 Subset: 669 at cycle number: 54264
 1,9,1,2,9,2 Subset: 670 at cycle number: 54264
 1,1,1,9,1,9,2 Subset: 671 at cycle number: 54264
 12,1,1,2,1,5,2 Subset: 672 at cycle number: 54264
 2,5,2,1,5,9 Subset: 673 at cycle number: 54264
 1,9,2,2,9,1 Subset: 674 at cycle number: 54264
 9,2,5,1,5,1,1 Subset: 675 at cycle number: 54264
 1,5,2,1,5,5,5 Subset: 676 at cycle number: 54264
 12,1,5,2,2,2 Subset: 677 at cycle number: 54264
 5,1,5,1,1,9,2 Subset: 678 at cycle number: 54264

COMBINATIONS (WITH REPLACEMENT)

$C^R(n+r) = (n+r-1)! / r!(n-1)!$

$C^R(6,16) = 21! / 16!(5)!$

Combinations: -1692

*****INITIAL VALUE OF CYCLES: 0

*****NEW VALUE CYCLES: 1

*****RUNNING TOTAL CYCLES: 54265

***PROCESSING SET AT INDEX: 678

ENDING AT INDEX:*** 678

COMBINATIONS (WITH REPLACEMENT)

$C^R(n+r) = (n+r-1)! / r!(n-1)!$
 $C^R(6,17) = 22! / 17!(5)!$
Combinations: -29
*****INITIAL VALUE OF CYCLES: 0
*****NEW VALUE CYCLES: 1
*****RUNNING TOTAL CYCLES: 54266
***PROCESSING SET AT INDEX: 678
ENDING AT INDEX:*** 678

COMBINATIONS (WITH REPLACEMENT)
 $C^R(n+r) = (n+r-1)! / r!(n-1)!$
 $C^R(6,18) = 23! / 18!(5)!$
Combinations: 10
*****INITIAL VALUE OF CYCLES: 0
*****NEW VALUE CYCLES: 10
*****RUNNING TOTAL CYCLES: 54276
***PROCESSING SET AT INDEX: 678
ENDING AT INDEX:*** 678

COMBINATIONS (WITH REPLACEMENT)
 $C^R(n+r) = (n+r-1)! / r!(n-1)!$
 $C^R(6,19) = 24! / 19!(5)!$
Combinations: 2
*****INITIAL VALUE OF CYCLES: 0
*****NEW VALUE CYCLES: 2
*****RUNNING TOTAL CYCLES: 54278
***PROCESSING SET AT INDEX: 678
ENDING AT INDEX:*** 678

COMBINATIONS (WITH REPLACEMENT)
 $C^R(n+r) = (n+r-1)! / r!(n-1)!$
 $C^R(6,20) = 25! / 20!(5)!$
Combinations: -2
*****INITIAL VALUE OF CYCLES: 0
*****NEW VALUE CYCLES: 1
*****RUNNING TOTAL CYCLES: 54279
***PROCESSING SET AT INDEX: 678
ENDING AT INDEX:*** 678

COMBINATIONS (WITH REPLACEMENT)
 $C^R(n+r) = (n+r-1)! / r!(n-1)!$
 $C^R(6,21) = 26! / 21!(5)!$
Combinations: 0
*****INITIAL VALUE OF CYCLES: 0
*****NEW VALUE CYCLES: 1
*****RUNNING TOTAL CYCLES: 54280
***PROCESSING SET AT INDEX: 678
ENDING AT INDEX:*** 678

COMBINATIONS (WITH REPLACEMENT)
 $C^R(n + r) = (n+r-1)! / r!(n-1)!$
 $C^R(6,22) = 27! / 22!(5)!$
Combinations: 2
*****INITIAL VALUE OF CYCLES: 0
*****NEW VALUE CYCLES: 2
*****RUNNING TOTAL CYCLES: 54282
***PROCESSING SET AT INDEX: 678
ENDING AT INDEX:*** 678

COMBINATIONS (WITH REPLACEMENT)
 $C^R(n + r) = (n+r-1)! / r!(n-1)!$
 $C^R(6,23) = 28! / 23!(5)!$
Combinations: 2
*****INITIAL VALUE OF CYCLES: 0
*****NEW VALUE CYCLES: 2
*****RUNNING TOTAL CYCLES: 54284
***PROCESSING SET AT INDEX: 678
ENDING AT INDEX:*** 678

COMBINATIONS (WITH REPLACEMENT)
 $C^R(n + r) = (n+r-1)! / r!(n-1)!$
 $C^R(6,24) = 29! / 24!(5)!$
Combinations: -12
*****INITIAL VALUE OF CYCLES: 0
*****NEW VALUE CYCLES: 1
*****RUNNING TOTAL CYCLES: 54285
***PROCESSING SET AT INDEX: 678
ENDING AT INDEX:*** 678

COMBINATIONS (WITH REPLACEMENT)
 $C^R(n + r) = (n+r-1)! / r!(n-1)!$
 $C^R(6,25) = 30! / 25!(5)!$
Combinations: 1
*****INITIAL VALUE OF CYCLES: 0
*****NEW VALUE CYCLES: 1
*****RUNNING TOTAL CYCLES: 54286
***PROCESSING SET AT INDEX: 678
ENDING AT INDEX:*** 678

*****ALL UNIQUE ENTRIES*****

2,2,1,2,5,2,9,1
1,9,1,1,1,2,9
9,2,1,2,5,5
5,1,5,2,2,9
9,9,2,2,2

1,2,12,1,1,5,2
1,9,9,5
1,2,5,2,2,2,9,1
5,9,1,1,1,2,5
2,2,1,2,1,2,1,2,1,1,9
1,5,5,2,2,5,2,1,1
2,1,5,2,12,2
2,1,9,2,1,9
12,5,1,5,1
2,9,5,1,5,2
1,12,2,1,5,2,1
2,2,12,1,5,2
9,5,2,1,2,5
12,2,5,1,2,2
1,5,1,12,2,2,1
12,1,2,5,2,2
2,5,2,1,2,12
1,5,5,2,1,9,1
5,1,12,2,2,1,1
2,5,2,5,5,5
1,2,5,5,9,2
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1,12,2,2,2,2,1,2
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9,5,1,5,1,1,1,1
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1,2,9,2,5,5
1,1,1,12,5,2,2
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12,1,2,1,1,2,5
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1,12,1,2,1,1,1,5
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9,1,5,9
1,5,9,1,5,2,1
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5,5,1,2,9,2
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1,12,2,5,2,2
5,5,2,12
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9,1,9,1,2,2
1,1,1,5,5,9,2
2,5,1,1,12,1,2
1,2,12,5,1,1,2

12,1,1,9,1
5,2,1,2,2,12
2,1,9,5,5,2
9,1,1,9,2,1,1
1,9,5,2,2,5
2,1,1,12,5,2,1
5,2,9,2,2,1,1,2
1,9,5,2,1,5,1
1,5,5,1,5,5,2
1,1,1,2,5,5,9
2,2,12,2,5,1
9,1,2,9,1,2
5,1,9,5,2,2
1,2,5,1,9,1,5
2,2,5,5,1,9
1,1,2,2,9,9
1,2,1,9,9,2
1,5,2,12,1,1,2
1,1,1,2,12,1,5,1
1,5,5,1,2,9,1
12,2,2,1,5,1,1
2,12,1,9
1,2,9,5,5,2
2,5,9,1,2,5
1,1,5,5,2,1,9
12,2,1,2,5,2
9,2,1,5,5,2
1,1,5,1,9,2,5
1,5,5,2,5,5,1
2,1,2,2,2,1,5,9
1,2,2,9,9,1
1,5,5,9,2,2
1,12,1,9,1
5,9,2,5,1,1,1
9,2,9,2,2
5,2,12,2,1,2
2,1,5,2,9,5
5,5,12,2
1,12,2,2,1,5,1
12,2,1,1,5,1,1,1
1,1,5,1,12,1,1,2
9,2,12,1
12,1,5,1,5
2,5,5,9,1,2
9,2,2,2,5,2,2
1,2,5,2,12,2
5,5,2,5,2,5
12,2,2,2,5,1

9,1,12,2
2,12,5,2,2,1
5,2,5,2,5,5
9,1,1,12,1
5,9,1,1,5,1,2
5,1,2,2,12,2
1,2,1,9,2,9
2,5,9,2,5,1
2,1,1,9,5,1,5
2,2,5,2,2,9,2
5,1,2,1,12,1,2
9,5,5,5
1,2,9,12
2,9,2,1,1,9
5,5,1,5,1,2,5
5,1,1,2,2,12,1
5,1,2,12,1,1,2
5,9,2,2,5,1
12,2,1,2,2,5
12,2,2,1,1,1,5
2,1,9,2,9,1
2,2,9,2,2,5,2
5,2,12,1,2,2
12,5,5,2
1,1,9,9,2,2
2,2,5,1,12,2
5,9,5,2,2,1
1,1,1,5,9,2,5
2,1,2,12,1,2,2,1,1
9,5,2,5,1,2
5,2,1,5,9,2
1,2,12,2,5,2
5,12,1,1,5
1,1,2,1,2,1,2,5,9
2,2,5,9,2,1,1,2
2,5,5,1,2,9
1,2,1,9,1,1,9
2,1,12,5,2,2
2,9,9,2,1,1
2,12,2,2,5,1
9,1,2,5,5,2
1,2,1,1,12,1,1,5
1,1,9,2,2,9
5,1,2,12,2,2
2,9,1,1,5,1,5
9,2,5,1,5,2
2,1,2,9,9,1
1,5,5,2,9,2

9,1,2,2,2,2,2,2
1,1,2,5,1,2,12
9,2,2,9,2
2,5,5,12
5,2,1,12,2,2
1,5,1,2,1,5,9
2,1,1,1,2,12,5
2,1,2,2,5,1,2,2,5,2
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1,1,12,1,2,1,2,2,1,1
2,9,2,9,1,1
1,12,9,1,1
5,5,2,2,9,1
1,5,1,2,2,9,2,2
1,9,1,1,5,1,5,1
2,9,1,2,5,5
9,1,1,9,2,2
12,1,1,2,2,5,1
1,2,12,5,1,2,1
2,5,2,9,5,1
1,5,9,9
9,1,2,1,5,1,5
1,5,5,9,1,2,1
1,9,5,2,5,2
5,1,5,12,1
5,2,1,2,5,2,1,1,5
2,5,1,2,9,5
2,5,1,5,9,1,1
12,1,5,2,2,1,1
5,1,2,1,2,12,1
1,1,5,1,2,9,5
1,9,2,5,2,5
12,9,1,1,1
1,9,1,9,2,1,1
2,9,9,1,1,2
5,2,9,5,1,1,1
5,2,5,1,9,2
1,1,5,2,12,1,2
2,2,1,12,5,1,1
1,2,2,1,1,12,5
2,5,2,12,1,1,1
5,5,1,2,2,9
2,2,1,9,5,1,2,2
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2,1,9,5,5,1,1
1,5,12,1,5

1,2,5,2,5,9
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2,5,2,2,1,12
5,5,9,1,1,2,1
5,2,1,5,5,1,5
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9,1,1,5,2,2,2,2

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5,2,5,9,2,1
2,1,2,1,5,1,12
12,5,2,5
12,1,1,5,2,1,2
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12,5,1,2,2,1,1
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12,5,1,1,5
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5,1,5,9,1,1,2
5,12,1,5,1
2,2,9,9,1,1
1,1,1,9,2,1,1,1,2,5
5,2,1,1,2,1,1,1,1,9
9,1,1,1,1,2,9
2,5,5,2,1,2,1,5,1
2,9,9,2,2
1,1,2,2,12,5,1
2,12,2,1,5,2
2,1,2,9,5,5
1,1,5,5,5,2,5
1,1,9,1,12
12,2,9,1
5,1,1,5,1,9,2
12,12
1,9,1,12,1
2,1,5,1,12,1,2
2,2,12,1,1,1,5
9,12,1,1,1
5,2,2,5,5,5
12,1,1,1,1,1,1,5,1
2,12,1,5,1,1,2
9,5,1,5,2,2
1,12,9,2
9,2,1,1,2,9
1,1,9,2,9,1,1
2,12,2,5,2,1
2,5,1,9,5,2
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9,1,2,5,1,2,2,2
1,2,2,5,2,1,9,2
5,2,5,1,1,5,5
2,2,2,2,9,5,2
1,9,1,2,5,5,1
2,9,5,5,2,1
12,9,1,2
2,9,1,2,9,1
2,5,2,1,5,2,2,5
2,2,2,9,9

2,1,2,12,2,5
5,1,2,5,1,5,1,2,2
5,2,5,5,5,1,1
1,2,5,9,5,2
2,12,1,5,2,2
2,9,1,1,1,2,1,5,2
1,1,5,5,12
1,9,1,1,2,1,2,5,2
9,1,2,5,2,5
2,5,1,2,5,9
1,1,1,12,1,1,5,2
1,9,2,1,5,1,5
1,5,2,1,1,12,2
1,2,5,1,1,2,12
1,1,9,9,2,1,1
5,2,2,1,9,5
5,2,2,5,2,5,1,2
5,1,2,5,1,5,5
1,1,12,2,1,2,5
2,2,5,9,1,5
5,1,5,1,12
2,1,2,1,2,5,1,5,5
1,5,12,5,1
2,1,12,2,1,1,5
2,12,2,5,1,2
1,1,12,9,1
2,1,5,2,2,12
5,2,1,2,9,5
2,2,1,2,5,12
5,2,2,1,2,12
1,9,12,1,1
2,1,2,1,1,12,5
1,1,1,9,12
5,2,1,1,2,12,1
1,9,12,2
2,2,9,1,1,9
1,5,1,1,5,9,2
1,2,5,5,1,9,1
9,2,5,2,5,1
12,1,1,1,9
5,5,1,1,1,1,1,9
1,2,5,9,2,5
5,1,1,12,5
2,5,1,2,12,2
2,2,2,5,12,1
5,5,2,1,2,9
5,9,1,2,2,5
1,1,2,1,12,2,5

2,5,12,5
1,5,2,1,12,1,2
1,5,2,5,9,1,1
5,2,2,2,2,1,1,9
5,1,1,5,12
2,5,2,1,9,2,2,1
12,1,9,1,1
9,9,1,5
2,2,2,2,1,2,12,1
1,5,1,2,9,1,5
1,12,2,2,2,5
2,2,5,5,9,1
1,1,1,9,5,2,5
2,2,5,12,2,1
1,5,2,2,2,5,5,2
1,12,1,5,1,2,2
1,1,12,5,2,1,2
1,9,1,2,9,2
1,1,1,9,1,9,2
2,12,9,1
2,1,5,9,5,2
1,2,2,12,5,2
5,2,5,5,5,2
5,12,5,1,1
2,1,1,9,2,5,2,2
1,2,2,5,9,5
12,1,1,2,1,5,2
2,5,5,2,5,5
2,5,2,1,5,9
2,5,1,1,9,5,1
1,9,2,2,9,1
9,2,5,1,5,1,1
9,1,2,2,5,5
1,2,2,9,1,9
2,12,1,2,5,2
2,1,1,9,2,9
5,5,5,9
9,1,1,1,12
1,12,1,1,9
1,2,1,9,5,1,5
1,5,2,1,5,5,5
12,1,5,2,2,2
5,1,12,1,5
5,2,2,2,12,1
5,1,5,1,1,9,2
2,9,1,5,2,5
1,1,2,1,5,2,12
5,12,1,2,2,2

9,1,5,1,5,2,1
678 unique combinations

** Process exited - Return Code: 0 **

***** OUTPUT *****

NOTE ALL EXCESSIVE SCREEN OUTPUTS HAVE BEEN REMOVED TO MAXIMISE THE RETURNED SCENARIOS:

TEST CASE:

2303 combinations

```
}while (cycles<combinations*10);
```

```
2,5,2,5,2,2,1,5  
1,2,9,2,2,1,5,2  
5,1,1,2,1,1,5,2,2,2  
1,2,2,2,1,2,2,1
```



11 numbers

2303 unique combinations

***** **OUTPUT** *****

NOTE ALL EXCESSIVE SCREEN OUTPUTS HAVE BEEN REMOVED TO MAXIMISE THE RETURNED SCENARIOS:

TEST CASE:

3102 combinations

```
}while (cycles<combinations*20);
```

12 numbers

1,2,2,1,9,1,5,1,2
5,2,1,2,2,5,1,1,1,2,1,1

3102 unique combinations

***** **OUTPUT** *****

NOTE ALL EXCESSIVE SCREEN OUTPUTS HAVE BEEN REMOVED TO MAXIMISE THE RETURNED SCENARIOS:

TEST CASE:

3682 combinations

```
}while (cycles<combinations*30);
```

13 numbers

5,1,5,1,2,5,5
9,5,1,5,2,2
1,5,2,1,2,1,1,1,1,1,5,2,1
1,12,9,2

3682 unique combinations

TEST CASE:

4982 combinations

***** **OUTPUT** *****

NOTE ALL EXCESSIVE SCREEN OUTPUTS HAVE BEEN REMOVED TO MAXIMISE THE RETURNED SCENARIOS:

```
}while (cycles<combinations*60);
```

13 numbers



```
9,1,2,2,1,1,1,5,2  
2,1,1,1,1,2,5,9,2  
1,1,1,5,2,1,2,1,1,2,5,1,1  
9,5,1,1,1,1,2,2,2  
8,8,8,8,1,8,1,5
```

4982 unique combinations

TEST CASE:

5957 combinations

***** **OUTPUT** *****

NOTE ALL EXCESSIVE SCREEN OUTPUTS HAVE BEEN REMOVED TO MAXIMISE THE RETURNED SCENARIOS:

```
}while (cycles<combinations*90);|
```

13 numbers



```
2,1,2,5,1,1,5,5,2  
1,1,2,1,2,9,1,1,1,2,1,1,1  
1,5,1,1,1,1,12,1,1
```

5957 unique combinations

TEST CASE:

7355 combinations

***** **OUTPUT** *****

NOTE ALL EXCESSIVE SCREEN OUTPUTS HAVE BEEN REMOVED TO MAXIMISE THE RETURNED SCENARIOS:

```
}while (cycles<combinations*150);|
```

13 numbers

```
1,9,2,2,2,1,1,1,1,1,1,1,1,1  
1,1,5,5,1,1,9,1
```

```
7355 unique combinations
```

TEST CASE:

13033 combinations

***** **OUTPUT** *****

NOTE ALL EXCESSIVE SCREEN OUTPUTS HAVE BEEN REMOVED TO MAXIMISE THE RETURNED SCENARIOS:

```
}while (cycles<combinations*700);
```

13 numbers

```
9,5,2,1,1,1,5  
1,1,5,2,1,1,5,1,1,2,1,2,1  
2,5,5,2,2,1,1,5,1
```

```
13033 unique combinations
```


It is beginning to emerge that there are too many combinations given that it is without replacement.
It will just keep on increasing....
And there is little hope in finding a larger set than 13 numbers...

I will now just run through two more test scenarios to demonstrate program is functioning correctly.
Since there is lots useful transferrable code here.

TEST CASE: I chose this since it would have a finite number combinations in a small computational cycle... And could see the full range screen outputs...

```
int [] X = new int []{2,1,4};
```

```
}while (cycles<combinations*4000);
```

```
static int k = 8; // values in subset will add up to value k
```

***** OUTPUT *****

NOTE: EXCESSIVE SCREEN OUTPUTS HAVE BEEN PRESERVED TO SHOW FUNCTIONALITY.....

Note: Combination.java uses unchecked or unsafe operations.

Note: Recompile with -Xlint:unchecked for details.

Welcome to Online IDE!! Happy Coding :)

Maxvalue: 8

COMBINATIONS (WITH REPLACEMENT)

$C^R(n + r) = (n+r-1)! / r!(n-1)!$

$C^R(3,0) = 2! / 0!(2)!$

Combinations: 1

*****INITIAL VALUE OF CYCLES: 0

*****Contents of the backup set

*****Contents of the valuesSet

*****NEW VALUE CYCLES: 4000

*****RUNNING TOTAL CYCLES: 4000

***PROCESSING SET AT INDEX: 0

ENDING AT INDEX:*** 0

COMBINATIONS (WITH REPLACEMENT)

$$C^R(n + r) = (n+r-1)! / r!(n-1)!$$

$$C^R(3,1) = 3! / 1!(2)!$$

Combinations: 3

*****INITIAL VALUE OF CYCLES: 0

*****Contents of the backup set

*****Contents of the valuesSet

*****NEW VALUE CYCLES: 12000

*****RUNNING TOTAL CYCLES: 16000

***PROCESSING SET AT INDEX: 0

ENDING AT INDEX:*** 0

COMBINATIONS (WITH REPLACEMENT)

$$C^R(n + r) = (n+r-1)! / r!(n-1)!$$

$$C^R(3,2) = 4! / 2!(2)!$$

Combinations: 6

*****INITIAL VALUE OF CYCLES: 0

*****Contents of the backup set

*****Contents of the valuesSet

4,4

*****NEW VALUE CYCLES: 24000

*****RUNNING TOTAL CYCLES: 40000

***PROCESSING SET AT INDEX: 0

ENDING AT INDEX:*** 1

4,4 Subset: 1 at cycle number: 40000

COMBINATIONS (WITH REPLACEMENT)

$$C^R(n + r) = (n+r-1)! / r!(n-1)!$$

$$C^R(3,3) = 5! / 3!(2)!$$

Combinations: 10

*****INITIAL VALUE OF CYCLES: 0

*****Contents of the backup set

4,4

*****Contents of the valuesSet

4,2,2

2,4,2

2,2,4

4,4

Match found in backupValuesSet: 4,4

Match found in valuesSet: 4,4

valuesSet[n] set to ALREADY PROCESSED

*****NEW VALUE CYCLES: 40000

*****RUNNING TOTAL CYCLES: 80000

***PROCESSING SET AT INDEX: 1

****ENDING AT INDEX:**** 4**

4,2,2 Subset: 2 at cycle number: 80000

2,4,2 Subset: 3 at cycle number: 80000

2,2,4 Subset: 4 at cycle number: 80000

*****COMBINATIONS*** (WITH REPLACEMENT)**

$C^R(n + r) = (n+r-1)! / r!(n-1)!$

$C^R(3,4) = 6! / 4!(2)!$

Combinations: 15

*****INITIAL VALUE OF CYCLES: 0

*****Contents of the backup set

4,2,2 //It can be seen that match has been found with valuesSet...

2,4,2 //and as per issue described, they appear in different order due to how set

2,2,4 //populates and how valuesSet therefore has different ordering retrieving its values..

4,4

*****Contents of the valuesSet

4,1,2,1

4,1,1,2

2,2,2,2

1,1,2,4

1,1,4,2

4,2,1,1

2,1,4,1

2,1,1,4

4,2,2

2,4,2

2,2,4

2,4,1,1

4,4

1,4,2,1

1,4,1,2

1,2,1,4

1,2,4,1

Match found in backupValuesSet: 4,2,2

//it has correctly marked these as already processed

Match found in valuesSet: 4,2,2

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,4,2

Match found in valuesSet: 2,4,2

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,2,4

Match found in valuesSet: 2,2,4

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 4,4

Match found in valuesSet: 4,4

valuesSet[n] set to ALREADY PROCESSED

*****NEW VALUE CYCLES: 60000

*****RUNNING TOTAL CYCLES: 140000

***PROCESSING SET AT INDEX: 4

ENDING AT INDEX:*** 17

4,1,2,1 Subset: 5 at cycle number: 140000 //the new subsets do not contain these Strings...
4,1,1,2 Subset: 6 at cycle number: 140000 //it can also be seen continuation in subset numbers..
2,2,2,2 Subset: 7 at cycle number: 140000
1,1,2,4 Subset: 8 at cycle number: 140000
1,1,4,2 Subset: 9 at cycle number: 140000
4,2,1,1 Subset: 10 at cycle number: 140000
2,1,4,1 Subset: 11 at cycle number: 140000
2,1,1,4 Subset: 12 at cycle number: 140000
2,4,1,1 Subset: 13 at cycle number: 140000
1,4,2,1 Subset: 14 at cycle number: 140000
1,4,1,2 Subset: 15 at cycle number: 140000
1,2,1,4 Subset: 16 at cycle number: 140000
1,2,4,1 Subset: 17 at cycle number: 140000

COMBINATIONS (WITH REPLACEMENT)

$C^R(n+r) = (n+r-1)! / r!(n-1)!$

$C^R(3,5) = 7! / 5!(2)!$

Combinations: 21

*****INITIAL VALUE OF CYCLES: 0

*****Contents of the backup set

4,1,2,1

4,1,1,2

2,2,2,2

1,1,2,4

1,1,4,2

4,2,1,1

2,1,4,1

2,1,1,4

4,2,2

2,4,2

2,2,4

2,4,1,1

4,4

1,4,2,1

1,4,1,2

1,2,1,4

1,2,4,1

*****Contents of the valuesSet

4,1,1,1,1

1,1,2,2,2

2,1,2,2,1

2,1,2,1,2

2,1,4,1

2,1,1,4

2,4,2

2,2,4

1,4,2,1

1,4,1,2

4,1,2,1

4,1,1,2

1,4,1,1,1

2,2,2,2

1,2,2,2,1

1,2,2,1,2

1,1,2,4

1,1,4,2

1,2,1,2,2

4,2,1,1

2,2,1,2,1

1,1,4,1,1

2,2,1,1,2

4,2,2

1,1,1,4,1

1,1,1,1,4

2,1,1,2,2

2,4,1,1

2,2,2,1,1

4,4

1,2,1,4

1,2,4,1

Match found in backupValuesSet: 4,1,2,1

Match found in valuesSet: 4,1,2,1

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 4,1,1,2

Match found in valuesSet: 4,1,1,2

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,2,2,2

Match found in valuesSet: 2,2,2,2

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,2,4

Match found in valuesSet: 1,1,2,4

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,4,2

Match found in valuesSet: 1,1,4,2

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 4,2,1,1

Match found in valuesSet: 4,2,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,1,4,1
Match found in valuesSet: 2,1,4,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,1,1,4
Match found in valuesSet: 2,1,1,4
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 4,2,2
Match found in valuesSet: 4,2,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,4,2
Match found in valuesSet: 2,4,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,2,4
Match found in valuesSet: 2,2,4
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,4,1,1
Match found in valuesSet: 2,4,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 4,4
Match found in valuesSet: 4,4
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,4,2,1
Match found in valuesSet: 1,4,2,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,4,1,2
Match found in valuesSet: 1,4,1,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,2,1,4
Match found in valuesSet: 1,2,1,4
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,2,4,1
Match found in valuesSet: 1,2,4,1
valuesSet[n] set to ALREADY PROCESSED

*****NEW VALUE CYCLES: 84000

*****RUNNING TOTAL CYCLES: 224000

***PROCESSING SET AT INDEX: 17

ENDING AT INDEX:*** 32

4,1,1,1,1 Subset: 18 at cycle number: 224000
1,1,2,2,2 Subset: 19 at cycle number: 224000
2,1,2,2,1 Subset: 20 at cycle number: 224000
2,1,2,1,2 Subset: 21 at cycle number: 224000
1,4,1,1,1 Subset: 22 at cycle number: 224000
1,2,2,2,1 Subset: 23 at cycle number: 224000
1,2,2,1,2 Subset: 24 at cycle number: 224000
1,2,1,2,2 Subset: 25 at cycle number: 224000
2,2,1,2,1 Subset: 26 at cycle number: 224000
1,1,4,1,1 Subset: 27 at cycle number: 224000
2,2,1,1,2 Subset: 28 at cycle number: 224000
1,1,1,4,1 Subset: 29 at cycle number: 224000
1,1,1,1,4 Subset: 30 at cycle number: 224000
2,1,1,2,2 Subset: 31 at cycle number: 224000
2,2,2,1,1 Subset: 32 at cycle number: 224000

COMBINATIONS (WITH REPLACEMENT)

$C^R(n+r) = (n+r-1)! / r!(n-1)!$

$C^R(3,6) = 8! / 6!(2)!$

Combinations: 28

*****INITIAL VALUE OF CYCLES: 0

*****Contents of the backup set

4,1,1,1,1
1,1,2,2,2
2,1,2,2,1
2,1,2,1,2
2,1,4,1
2,1,1,4
2,4,2
2,2,4
1,4,2,1
1,4,1,2
4,1,2,1
4,1,1,2
1,4,1,1,1
2,2,2,2
1,2,2,2,1
1,2,2,1,2
1,1,2,4
1,1,4,2
1,2,1,2,2
4,2,1,1
2,2,1,2,1
1,1,4,1,1
2,2,1,1,2

4,2,2
1,1,1,4,1
1,1,1,1,4
2,1,1,2,2
2,4,1,1
2,2,2,1,1
4,4
1,2,1,4
1,2,4,1
*****Contents of the valuesSet
4,1,1,1,1
1,1,2,2,2
2,1,2,2,1
2,1,2,1,2
2,2,1,1,1,1
1,2,2,1,1,1
2,1,1,1,2,1
2,1,1,1,1,2
1,1,2,1,1,2
1,1,2,1,2,1
2,1,4,1
2,1,1,4
2,4,2
2,2,4
1,1,2,2,1,1
1,4,2,1
1,4,1,2
2,1,1,2,1,1
1,1,1,2,1,2
1,1,1,2,2,1
4,1,2,1
4,1,1,2
1,4,1,1,1
2,2,2,2
1,2,2,2,1
1,2,2,1,2
2,1,2,1,1,1
1,2,1,1,2,1
1,2,1,1,1,2
1,1,2,4
1,1,4,2
1,2,1,2,2
4,2,1,1
1,1,1,1,2,2
2,2,1,2,1
1,1,4,1,1
2,2,1,1,2
4,2,2

1,1,1,4,1

1,1,1,1,4

2,1,1,2,2

2,4,1,1

2,2,2,1,1

4,4

1,2,1,2,1,1

1,2,1,4

1,2,4,1

Match found in backupValuesSet: 4,1,1,1,1

Match found in valuesSet: 4,1,1,1,1

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,2,2,2

Match found in valuesSet: 1,1,2,2,2

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,1,2,2,1

Match found in valuesSet: 2,1,2,2,1

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,1,2,1,2

Match found in valuesSet: 2,1,2,1,2

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,1,4,1

Match found in valuesSet: 2,1,4,1

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,1,1,4

Match found in valuesSet: 2,1,1,4

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,4,2

Match found in valuesSet: 2,4,2

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,2,4

Match found in valuesSet: 2,2,4

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,4,2,1

Match found in valuesSet: 1,4,2,1

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,4,1,2

Match found in valuesSet: 1,4,1,2

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 4,1,2,1
Match found in valuesSet: 4,1,2,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 4,1,1,2
Match found in valuesSet: 4,1,1,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,4,1,1,1
Match found in valuesSet: 1,4,1,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,2,2,2
Match found in valuesSet: 2,2,2,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,2,2,2,1
Match found in valuesSet: 1,2,2,2,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,2,2,1,2
Match found in valuesSet: 1,2,2,1,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,2,4
Match found in valuesSet: 1,1,2,4
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,4,2
Match found in valuesSet: 1,1,4,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,2,1,2,2
Match found in valuesSet: 1,2,1,2,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 4,2,1,1
Match found in valuesSet: 4,2,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,2,1,2,1
Match found in valuesSet: 2,2,1,2,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,4,1,1
Match found in valuesSet: 1,1,4,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,2,1,1,2
Match found in valuesSet: 2,2,1,1,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 4,2,2
Match found in valuesSet: 4,2,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,1,4,1
Match found in valuesSet: 1,1,1,4,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,1,1,4
Match found in valuesSet: 1,1,1,1,4
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,1,1,2,2
Match found in valuesSet: 2,1,1,2,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,4,1,1
Match found in valuesSet: 2,4,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,2,2,1,1
Match found in valuesSet: 2,2,2,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 4,4
Match found in valuesSet: 4,4
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,2,1,4
Match found in valuesSet: 1,2,1,4
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,2,4,1
Match found in valuesSet: 1,2,4,1
valuesSet[n] set to ALREADY PROCESSED

*****NEW VALUE CYCLES: 112000

*****RUNNING TOTAL CYCLES: 336000

***PROCESSING SET AT INDEX: 32

ENDING AT INDEX:*** 47

2,2,1,1,1,1 Subset: 33 at cycle number: 336000

1,2,2,1,1,1 Subset: 34 at cycle number: 336000

2,1,1,1,2,1 Subset: 35 at cycle number: 336000

2,1,1,1,1,2 Subset: 36 at cycle number: 336000
 1,1,2,1,1,2 Subset: 37 at cycle number: 336000
 1,1,2,1,2,1 Subset: 38 at cycle number: 336000
 1,1,2,2,1,1 Subset: 39 at cycle number: 336000
 2,1,1,2,1,1 Subset: 40 at cycle number: 336000
 1,1,1,2,1,2 Subset: 41 at cycle number: 336000
 1,1,1,2,2,1 Subset: 42 at cycle number: 336000
 2,1,2,1,1,1 Subset: 43 at cycle number: 336000
 1,2,1,1,2,1 Subset: 44 at cycle number: 336000
 1,2,1,1,1,2 Subset: 45 at cycle number: 336000
 1,1,1,1,2,2 Subset: 46 at cycle number: 336000
 1,2,1,2,1,1 Subset: 47 at cycle number: 336000

COMBINATIONS (WITH REPLACEMENT)

$$C^R(n+r) = (n+r-1)! / r!(n-1)!$$

$$C^R(3,7) = 9! / 7!(2)!$$

Combinations: 36

*****INITIAL VALUE OF CYCLES: 0

*****Contents of the backup set

4,1,1,1,1
 1,1,2,2,2
 2,1,2,2,1
 2,1,2,1,2
 2,2,1,1,1,1
 1,2,2,1,1,1
 2,1,1,1,2,1
 2,1,1,1,1,2
 1,1,2,1,1,2
 1,1,2,1,2,1
 2,1,4,1
 2,1,1,4
 2,4,2
 2,2,4
 1,1,2,2,1,1
 1,4,2,1
 1,4,1,2
 2,1,1,2,1,1
 1,1,1,2,1,2
 1,1,1,2,2,1
 4,1,2,1
 4,1,1,2
 1,4,1,1,1
 2,2,2,2
 1,2,2,2,1
 1,2,2,1,2
 2,1,2,1,1,1
 1,2,1,1,2,1
 1,2,1,1,1,2

1,1,2,4
1,1,4,2
1,2,1,2,2
4,2,1,1
1,1,1,1,2,2
2,2,1,2,1
1,1,4,1,1
2,2,1,1,2
4,2,2
1,1,1,4,1
1,1,1,1,4
2,1,1,2,2
2,4,1,1
2,2,2,1,1
4,4
1,2,1,2,1,1
1,2,1,4
1,2,4,1

*****Contents of the valuesSet

2,1,2,2,1
2,2,1,1,1,1
1,2,2,1,1,1
2,1,1,1,2,1
1,1,2,1,2,1
2,1,4,1
1,1,2,1,1,1,1
2,4,2
2,2,4
1,4,2,1
1,1,1,2,1,2
4,1,1,2
2,2,2,2
1,2,2,1,2
1,2,1,1,2,1
4,2,1,1
2,2,1,2,1
1,1,4,1,1
1,1,1,1,1,1,2
4,2,2
1,1,1,4,1
4,4
1,2,1,4
4,1,1,1,1
1,1,2,2,2
2,1,2,1,2
2,1,1,1,1,2
1,1,2,1,1,2
2,1,1,4

2,1,1,1,1,1,1

1,1,2,2,1,1

1,1,1,1,2,1,1

1,4,1,2

2,1,1,2,1,1

1,1,1,2,2,1

4,1,2,1

1,4,1,1,1

1,2,2,2,1

2,1,2,1,1,1

1,2,1,1,1,2

1,1,2,4

1,1,4,2

1,2,1,2,2

1,1,1,1,2,2

2,2,1,1,2

1,1,1,1,1,2,1

1,2,1,1,1,1,1

1,1,1,1,4

1,1,1,2,1,1,1

2,1,1,2,2

2,4,1,1

2,2,2,1,1

1,2,1,2,1,1

1,2,4,1

Match found in backupValuesSet: 4,1,1,1,1

Match found in valuesSet: 4,1,1,1,1

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,2,2,2

Match found in valuesSet: 1,1,2,2,2

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,1,2,2,1

Match found in valuesSet: 2,1,2,2,1

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,1,2,1,2

Match found in valuesSet: 2,1,2,1,2

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,2,1,1,1,1

Match found in valuesSet: 2,2,1,1,1,1

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,2,2,1,1,1

Match found in valuesSet: 1,2,2,1,1,1

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,1,1,1,2,1
Match found in valuesSet: 2,1,1,1,2,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,1,1,1,1,2
Match found in valuesSet: 2,1,1,1,1,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,2,1,1,2
Match found in valuesSet: 1,1,2,1,1,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,2,1,2,1
Match found in valuesSet: 1,1,2,1,2,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,1,4,1
Match found in valuesSet: 2,1,4,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,1,1,4
Match found in valuesSet: 2,1,1,4
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,4,2
Match found in valuesSet: 2,4,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,2,4
Match found in valuesSet: 2,2,4
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,2,2,1,1
Match found in valuesSet: 1,1,2,2,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,4,2,1
Match found in valuesSet: 1,4,2,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,4,1,2
Match found in valuesSet: 1,4,1,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,1,1,2,1,1
Match found in valuesSet: 2,1,1,2,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,1,2,1,2
Match found in valuesSet: 1,1,1,2,1,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,1,2,2,1
Match found in valuesSet: 1,1,1,2,2,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 4,1,2,1
Match found in valuesSet: 4,1,2,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 4,1,1,2
Match found in valuesSet: 4,1,1,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,4,1,1,1
Match found in valuesSet: 1,4,1,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,2,2,2
Match found in valuesSet: 2,2,2,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,2,2,2,1
Match found in valuesSet: 1,2,2,2,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,2,2,1,2
Match found in valuesSet: 1,2,2,1,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,1,2,1,1,1
Match found in valuesSet: 2,1,2,1,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,2,1,1,2,1
Match found in valuesSet: 1,2,1,1,2,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,2,1,1,1,2
Match found in valuesSet: 1,2,1,1,1,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,2,4
Match found in valuesSet: 1,1,2,4
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,4,2
Match found in valuesSet: 1,1,4,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,2,1,2,2
Match found in valuesSet: 1,2,1,2,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 4,2,1,1
Match found in valuesSet: 4,2,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,1,1,2,2
Match found in valuesSet: 1,1,1,1,2,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,2,1,2,1
Match found in valuesSet: 2,2,1,2,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,4,1,1
Match found in valuesSet: 1,1,4,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,2,1,1,2
Match found in valuesSet: 2,2,1,1,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 4,2,2
Match found in valuesSet: 4,2,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,1,4,1
Match found in valuesSet: 1,1,1,4,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,1,1,4
Match found in valuesSet: 1,1,1,1,4
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,1,1,2,2
Match found in valuesSet: 2,1,1,2,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,4,1,1
Match found in valuesSet: 2,4,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,2,2,1,1
Match found in valuesSet: 2,2,2,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 4,4
Match found in valuesSet: 4,4
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,2,1,2,1,1
Match found in valuesSet: 1,2,1,2,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,2,1,4
Match found in valuesSet: 1,2,1,4
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,2,4,1
Match found in valuesSet: 1,2,4,1
valuesSet[n] set to ALREADY PROCESSED

*****NEW VALUE CYCLES: 144000

*****RUNNING TOTAL CYCLES: 480000

***PROCESSING SET AT INDEX: 47

ENDING AT INDEX:*** 54

1,1,2,1,1,1,1 Subset: 48 at cycle number: 480000
1,1,1,1,1,1,2 Subset: 49 at cycle number: 480000
2,1,1,1,1,1,1 Subset: 50 at cycle number: 480000
1,1,1,1,2,1,1 Subset: 51 at cycle number: 480000
1,1,1,1,1,2,1 Subset: 52 at cycle number: 480000
1,2,1,1,1,1,1 Subset: 53 at cycle number: 480000
1,1,1,2,1,1,1 Subset: 54 at cycle number: 480000

COMBINATIONS (WITH REPLACEMENT)

$C^R(n + r) = (n+r-1)! / r!(n-1)!$

$C^R(3,8) = 10! / 8!(2)!$

Combinations: 45

*****INITIAL VALUE OF CYCLES: 0

*****Contents of the backup set

2,1,2,2,1
2,2,1,1,1,1
1,2,2,1,1,1
2,1,1,1,2,1
1,1,2,1,2,1
2,1,4,1
1,1,2,1,1,1,1
2,4,2
2,2,4

1,4,2,1
1,1,1,2,1,2
4,1,1,2
2,2,2,2
1,2,2,1,2
1,2,1,1,2,1
4,2,1,1
2,2,1,2,1
1,1,4,1,1
1,1,1,1,1,1,2
4,2,2
1,1,1,4,1
4,4
1,2,1,4
4,1,1,1,1
1,1,2,2,2
2,1,2,1,2
2,1,1,1,1,2
1,1,2,1,1,2
2,1,1,4
2,1,1,1,1,1,1
1,1,2,2,1,1
1,1,1,1,2,1,1
1,4,1,2
2,1,1,2,1,1
1,1,1,2,2,1
4,1,2,1
1,4,1,1,1
1,2,2,2,1
2,1,2,1,1,1
1,2,1,1,1,2
1,1,2,4
1,1,4,2
1,2,1,2,2
1,1,1,1,2,2
2,2,1,1,2
1,1,1,1,1,2,1
1,2,1,1,1,1,1
1,1,1,1,4
1,1,1,2,1,1,1
2,1,1,2,2
2,4,1,1
2,2,2,1,1
1,2,1,2,1,1
1,2,4,1

*****Contents of the valuesSet

2,1,2,2,1
2,2,1,1,1,1

1,2,2,1,1,1
2,1,1,1,2,1
1,1,2,1,2,1
1,1,1,1,1,1,1,1
2,1,4,1
1,1,2,1,1,1,1
2,4,2
2,2,4
1,4,2,1
1,1,1,2,1,2
4,1,1,2
2,2,2,2
1,2,2,1,2
1,2,1,1,2,1
4,2,1,1
2,2,1,2,1
1,1,4,1,1
1,1,1,1,1,1,2
4,2,2
1,1,1,4,1
4,4
1,2,1,4
4,1,1,1,1
1,1,2,2,2
2,1,2,1,2
2,1,1,1,1,2
1,1,2,1,1,2
2,1,1,4
2,1,1,1,1,1,1
1,1,2,2,1,1
1,1,1,1,2,1,1
1,4,1,2
2,1,1,2,1,1
1,1,1,2,2,1
4,1,2,1
1,4,1,1,1
1,2,2,2,1
2,1,2,1,1,1
1,2,1,1,1,2
1,1,2,4
1,1,4,2
1,2,1,2,2
1,1,1,1,2,2
2,2,1,1,2
1,1,1,1,1,2,1
1,2,1,1,1,1,1
1,1,1,1,4
1,1,1,2,1,1,1

2,1,1,2,2

2,4,1,1

2,2,2,1,1

1,2,1,2,1,1

1,2,4,1

Match found in backupValuesSet: 2,1,2,2,1

Match found in valuesSet: 2,1,2,2,1

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,2,1,1,1,1

Match found in valuesSet: 2,2,1,1,1,1

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,2,2,1,1,1

Match found in valuesSet: 1,2,2,1,1,1

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,1,1,1,2,1

Match found in valuesSet: 2,1,1,1,2,1

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,2,1,2,1

Match found in valuesSet: 1,1,2,1,2,1

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,1,4,1

Match found in valuesSet: 2,1,4,1

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,2,1,1,1,1

Match found in valuesSet: 1,1,2,1,1,1,1

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,4,2

Match found in valuesSet: 2,4,2

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,2,4

Match found in valuesSet: 2,2,4

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,4,2,1

Match found in valuesSet: 1,4,2,1

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,1,2,1,2

Match found in valuesSet: 1,1,1,2,1,2

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 4,1,1,2
Match found in valuesSet: 4,1,1,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,2,2,2
Match found in valuesSet: 2,2,2,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,2,2,1,2
Match found in valuesSet: 1,2,2,1,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,2,1,1,2,1
Match found in valuesSet: 1,2,1,1,2,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 4,2,1,1
Match found in valuesSet: 4,2,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,2,1,2,1
Match found in valuesSet: 2,2,1,2,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,4,1,1
Match found in valuesSet: 1,1,4,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,1,1,1,2
Match found in valuesSet: 1,1,1,1,1,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 4,2,2
Match found in valuesSet: 4,2,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,1,4,1
Match found in valuesSet: 1,1,1,4,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 4,4
Match found in valuesSet: 4,4
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,2,1,4
Match found in valuesSet: 1,2,1,4
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 4,1,1,1,1
Match found in valuesSet: 4,1,1,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,2,2,2
Match found in valuesSet: 1,1,2,2,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,1,2,1,2
Match found in valuesSet: 2,1,2,1,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,1,1,1,1,2
Match found in valuesSet: 2,1,1,1,1,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,2,1,1,2
Match found in valuesSet: 1,1,2,1,1,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,1,1,4
Match found in valuesSet: 2,1,1,4
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,1,1,1,1,1,1
Match found in valuesSet: 2,1,1,1,1,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,2,2,1,1
Match found in valuesSet: 1,1,2,2,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,1,1,2,1,1
Match found in valuesSet: 1,1,1,1,2,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,4,1,2
Match found in valuesSet: 1,4,1,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,1,1,2,1,1
Match found in valuesSet: 2,1,1,2,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,1,2,2,1
Match found in valuesSet: 1,1,1,2,2,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 4,1,2,1
Match found in valuesSet: 4,1,2,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,4,1,1,1
Match found in valuesSet: 1,4,1,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,2,2,2,1
Match found in valuesSet: 1,2,2,2,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,1,2,1,1,1
Match found in valuesSet: 2,1,2,1,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,2,1,1,1,2
Match found in valuesSet: 1,2,1,1,1,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,2,4
Match found in valuesSet: 1,1,2,4
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,4,2
Match found in valuesSet: 1,1,4,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,2,1,2,2
Match found in valuesSet: 1,2,1,2,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,1,1,2,2
Match found in valuesSet: 1,1,1,1,2,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,2,1,1,2
Match found in valuesSet: 2,2,1,1,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,1,1,1,2,1
Match found in valuesSet: 1,1,1,1,1,2,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,2,1,1,1,1,1
Match found in valuesSet: 1,2,1,1,1,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,1,1,4
Match found in valuesSet: 1,1,1,1,4
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,1,2,1,1,1
Match found in valuesSet: 1,1,1,2,1,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,1,1,2,2
Match found in valuesSet: 2,1,1,2,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,4,1,1
Match found in valuesSet: 2,4,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,2,2,1,1
Match found in valuesSet: 2,2,2,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,2,1,2,1,1
Match found in valuesSet: 1,2,1,2,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,2,4,1
Match found in valuesSet: 1,2,4,1
valuesSet[n] set to ALREADY PROCESSED

*****NEW VALUE CYCLES: 180000
*****RUNNING TOTAL CYCLES: 660000
***PROCESSING SET AT INDEX: 54
ENDING AT INDEX:*** 55

1,1,1,1,1,1,1 Subset: 55 at cycle number: 660000 //same outcome as number in the set

COMBINATIONS (WITH REPLACEMENT)
 $C^R(n+r) = (n+r-1)! / r!(n-1)!$
 $C^R(3,9) = 11! / 9!(2)!$
Combinations: 55
*****INITIAL VALUE OF CYCLES: 0
*****Contents of the backup set
2,1,2,2,1
2,2,1,1,1,1
1,2,2,1,1,1
2,1,1,1,2,1
1,1,2,1,2,1
1,1,1,1,1,1,1

2,1,4,1
1,1,2,1,1,1,1
2,4,2
2,2,4
1,4,2,1
1,1,1,2,1,2
4,1,1,2
2,2,2,2
1,2,2,1,2
1,2,1,1,2,1
4,2,1,1
2,2,1,2,1
1,1,4,1,1
1,1,1,1,1,1,2
4,2,2
1,1,1,4,1
4,4
1,2,1,4
4,1,1,1,1
1,1,2,2,2
2,1,2,1,2
2,1,1,1,1,2
1,1,2,1,1,2
2,1,1,4
2,1,1,1,1,1,1
1,1,2,2,1,1
1,1,1,1,2,1,1
1,4,1,2
2,1,1,2,1,1
1,1,1,2,2,1
4,1,2,1
1,4,1,1,1
1,2,2,2,1
2,1,2,1,1,1
1,2,1,1,1,2
1,1,2,4
1,1,4,2
1,2,1,2,2
1,1,1,1,2,2
2,2,1,1,2
1,1,1,1,1,2,1
1,2,1,1,1,1,1
1,1,1,1,4
1,1,1,2,1,1,1
2,1,1,2,2
2,4,1,1
2,2,2,1,1
1,2,1,2,1,1

1,2,4,1

*****Contents of the valuesSet

2,1,2,2,1

2,2,1,1,1,1

1,2,2,1,1,1

2,1,1,1,2,1

1,1,2,1,2,1

1,1,1,1,1,1,1

2,1,4,1

1,1,2,1,1,1,1

2,4,2

2,2,4

1,4,2,1

1,1,1,2,1,2

4,1,1,2

2,2,2,2

1,2,2,1,2

1,2,1,1,2,1

4,2,1,1

2,2,1,2,1

1,1,4,1,1

1,1,1,1,1,1,2

4,2,2

1,1,1,4,1

4,4

1,2,1,4

4,1,1,1,1

1,1,2,2,2

2,1,2,1,2

2,1,1,1,1,2

1,1,2,1,1,2

2,1,1,4

2,1,1,1,1,1,1

1,1,2,2,1,1

1,1,1,1,2,1,1

1,4,1,2

2,1,1,2,1,1

1,1,1,2,2,1

4,1,2,1

1,4,1,1,1

1,2,2,2,1

2,1,2,1,1,1

1,2,1,1,1,2

1,1,2,4

1,1,4,2

1,2,1,2,2

1,1,1,1,2,2

2,2,1,1,2

1,1,1,1,1,2,1

1,2,1,1,1,1,1

1,1,1,1,4

1,1,1,2,1,1,1

2,1,1,2,2

2,4,1,1

2,2,2,1,1

1,2,1,2,1,1

1,2,4,1

Match found in backupValuesSet: 2,1,2,2,1

Match found in valuesSet: 2,1,2,2,1

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,2,1,1,1,1

Match found in valuesSet: 2,2,1,1,1,1

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,2,2,1,1,1

Match found in valuesSet: 1,2,2,1,1,1

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,1,1,1,2,1

Match found in valuesSet: 2,1,1,1,2,1

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,2,1,2,1

Match found in valuesSet: 1,1,2,1,2,1

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,1,1,1,1,1,1

Match found in valuesSet: 1,1,1,1,1,1,1,1

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,1,4,1

Match found in valuesSet: 2,1,4,1

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,2,1,1,1,1

Match found in valuesSet: 1,1,2,1,1,1,1

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,4,2

Match found in valuesSet: 2,4,2

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,2,4

Match found in valuesSet: 2,2,4

valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,4,2,1
Match found in valuesSet: 1,4,2,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,1,2,1,2
Match found in valuesSet: 1,1,1,2,1,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 4,1,1,2
Match found in valuesSet: 4,1,1,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,2,2,2
Match found in valuesSet: 2,2,2,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,2,2,1,2
Match found in valuesSet: 1,2,2,1,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,2,1,1,2,1
Match found in valuesSet: 1,2,1,1,2,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 4,2,1,1
Match found in valuesSet: 4,2,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,2,1,2,1
Match found in valuesSet: 2,2,1,2,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,4,1,1
Match found in valuesSet: 1,1,4,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,1,1,1,1,2
Match found in valuesSet: 1,1,1,1,1,1,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 4,2,2
Match found in valuesSet: 4,2,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,1,4,1
Match found in valuesSet: 1,1,1,4,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 4,4
Match found in valuesSet: 4,4
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,2,1,4
Match found in valuesSet: 1,2,1,4
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 4,1,1,1,1
Match found in valuesSet: 4,1,1,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,2,2,2
Match found in valuesSet: 1,1,2,2,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,1,2,1,2
Match found in valuesSet: 2,1,2,1,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,1,1,1,1,2
Match found in valuesSet: 2,1,1,1,1,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,2,1,1,2
Match found in valuesSet: 1,1,2,1,1,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,1,1,4
Match found in valuesSet: 2,1,1,4
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,1,1,1,1,1,1
Match found in valuesSet: 2,1,1,1,1,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,2,2,1,1
Match found in valuesSet: 1,1,2,2,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,1,1,2,1,1
Match found in valuesSet: 1,1,1,1,2,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,4,1,2
Match found in valuesSet: 1,4,1,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,1,1,2,1,1
Match found in valuesSet: 2,1,1,2,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,1,2,2,1
Match found in valuesSet: 1,1,1,2,2,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 4,1,2,1
Match found in valuesSet: 4,1,2,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,4,1,1,1
Match found in valuesSet: 1,4,1,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,2,2,2,1
Match found in valuesSet: 1,2,2,2,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,1,2,1,1,1
Match found in valuesSet: 2,1,2,1,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,2,1,1,1,2
Match found in valuesSet: 1,2,1,1,1,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,2,4
Match found in valuesSet: 1,1,2,4
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,4,2
Match found in valuesSet: 1,1,4,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,2,1,2,2
Match found in valuesSet: 1,2,1,2,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,1,1,2,2
Match found in valuesSet: 1,1,1,1,2,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,2,1,1,2
Match found in valuesSet: 2,2,1,1,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,1,1,2,1
Match found in valuesSet: 1,1,1,1,2,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,2,1,1,1,1
Match found in valuesSet: 1,2,1,1,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,1,1,4
Match found in valuesSet: 1,1,1,1,4
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,1,1,2,1,1,1
Match found in valuesSet: 1,1,1,2,1,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,1,1,2,2
Match found in valuesSet: 2,1,1,2,2
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,4,1,1
Match found in valuesSet: 2,4,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 2,2,2,1,1
Match found in valuesSet: 2,2,2,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,2,1,2,1,1
Match found in valuesSet: 1,2,1,2,1,1
valuesSet[n] set to ALREADY PROCESSED

Match found in backupValuesSet: 1,2,4,1
Match found in valuesSet: 1,2,4,1
valuesSet[n] set to ALREADY PROCESSED

*****NEW VALUE CYCLES: 220000
*****RUNNING TOTAL CYCLES: 880000
***PROCESSING SET AT INDEX: 55
ENDING AT INDEX:*** 55

*****ALL UNIQUE ENTRIES*****
2,1,2,2,1
2,2,1,1,1,1
1,2,2,1,1,1
2,1,1,1,2,1

1,1,2,1,2,1
1,1,1,1,1,1,1
2,1,4,1
1,1,2,1,1,1,1
2,4,2
2,2,4
1,4,2,1
1,1,1,2,1,2
4,1,1,2
2,2,2,2
1,2,2,1,2
1,2,1,1,2,1
4,2,1,1
2,2,1,2,1
1,1,4,1,1
1,1,1,1,1,1,2
4,2,2
1,1,1,4,1
4,4
1,2,1,4
4,1,1,1,1
1,1,2,2,2
2,1,2,1,2
2,1,1,1,1,2
1,1,2,1,1,2
2,1,1,4
2,1,1,1,1,1,1
1,1,2,2,1,1
1,1,1,1,2,1,1
1,4,1,2
2,1,1,2,1,1
1,1,1,2,2,1
4,1,2,1
1,4,1,1,1
1,2,2,2,1
2,1,2,1,1,1
1,2,1,1,1,2
1,1,2,4
1,1,4,2
1,2,1,2,2
1,1,1,1,2,2
2,2,1,1,2
1,1,1,1,1,2,1
1,2,1,1,1,1,1
1,1,1,1,4
1,1,1,2,1,1,1
2,1,1,2,2
2,4,1,1

2,2,2,1,1
1,2,1,2,1,1
1,2,4,1

55 unique combinations //same outcome as number subsets

**** Process exited - Return Code: 0 ****

TEST CASE: I chose this since it would be pointless using computation if all numbers are the same.

```
static int k = 64; // values in subset will add up to value k
```

This can be set really high, but it will have no effect since code should exit.

```
}while (cycles<combinations*400000000);
```

```
int [] X = new int []{1,1,1,1,1};
```

******* OUTPUT *******

NOTE: EXCESSIVE SCREEN OUTPUTS HAVE BEEN PRESERVED TO SHOW FUNCTIONALITY..... HOWEVER IT WILL NOT REACH MAIN SECTION OF CODE AT ALL

Note: Combination.java uses unchecked or unsafe operations.

Note: Recompile with -Xlint:unchecked for details.

Welcome to Online IDE!! Happy Coding :)

Value of r=64 is too high computationally. It will be reduced to: 63 //it has to be remember this is calculated via $k / \text{minRValue} = 64/1 = 64$

*****COMBINATIONS*** (WITH REPLACEMENT)**

$C^R(n + r) = (n+r-1)! / r!(n-1)!$

Combinations: 1

This is the solution:

```
** Process exited - Return Code: 0 **
```

TEST CASE: The code suggests if there is no solution, return null

```
public static String FoundSubset()
{
    try
    {
        if (sc.valuesSet[0].isEmpty())
        {
            return null;
        }

    }
    catch (ArrayIndexOutOfBoundsException e)
    {
        return null;
    }
    return "";
}
```

***** OUTPUT *****

NOTE: EXCESSIVE SCREEN OUTPUTS HAVE BEEN PRESERVED TO SHOW FUNCTIONALITY..... HOWEVER IT WILL NOT REACH MAIN SECTION OF CODE AT ALL

```
static int k = 1; // values in subset will add up to value k
int [] X = new int []{7,5,2};
}while (cycles<combinations*40);
```

Note: Combination.java uses unchecked or unsafe operations.

Note: Recompile with -Xlint:unchecked for details.

Welcome to Online IDE!! Happy Coding :)

COMBINATIONS (WITH REPLACEMENT)

$$C^R(n + r) = (n+r-1)! / r!(n-1)!$$

$$C^R(3,0) = 2! / 0!(2)!$$

Combinations: 1

*****INITIAL VALUE OF CYCLES: 0

*****Contents of the backup set

*****Contents of the valuesSet

*****NEW VALUE CYCLES: 40

*****RUNNING TOTAL CYCLES: 40

***PROCESSING SET AT INDEX: 0

ENDING AT INDEX:*** 0

COMBINATIONS (WITH REPLACEMENT)

$$C^R(n + r) = (n+r-1)! / r!(n-1)!$$

$$C^R(3,1) = 3! / 1!(2)!$$

Combinations: 3

*****INITIAL VALUE OF CYCLES: 0

*****Contents of the backup set

*****Contents of the valuesSet

*****NEW VALUE CYCLES: 120

*****RUNNING TOTAL CYCLES: 160

***PROCESSING SET AT INDEX: 0

****ENDING AT INDEX:**** 0**

*******ALL UNIQUE ENTRIES*******

0 unique combinations

null **//this is just evidence null has been returned**

**** Process exited - Return Code: 0 ****