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Chapter 1

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Test Cases	1×30
Total	30
Total	100

Chapter 2

Metadata

2.1 Submitted Files

<div align="center">handin.time</div>

```
 1  03/02/2017  16:06:27  skasper:  csce322h0mework02part04.js  - OK
 2  03/02/2017  16:06:29  skasper:  csce322h0mework02part03.js  - OK
 3  03/02/2017  16:06:31  skasper:  csce322h0mework02part02.js  - OK
 4  03/02/2017  16:06:34  skasper:  csce322h0mework02part01.js  - OK
 5  03/02/2017  16:09:30  skasper:  csce322h0mework02part01.js  - OK
 6  03/02/2017  16:13:03  skasper:  csce322h0mework02part02.js  - OK
 7  03/02/2017  16:15:40  skasper:  csce322h0mework02part02.js  - OK
 8  03/02/2017  16:17:23  skasper:  csce322h0mework02part02.js  - OK
 9  03/02/2017  16:20:48  skasper:  csce322h0mework02part02.js  - OK
10  03/02/2017  16:26:54  skasper:  csce322h0mework02part02.js  - OK
11  03/02/2017  16:32:35  skasper:  csce322h0mework02part02.js  - OK
12  03/02/2017  16:49:42  skasper:  csce322h0mework02part02.js  - OK
13  03/02/2017  16:52:11  skasper:  csce322h0mework02part02.js  - OK
14  03/02/2017  16:55:00  skasper:  csce322h0mework02part01.js  - OK
15  03/02/2017  16:57:44  skasper:  csce322h0mework02part01.js  - OK
16  03/02/2017  17:00:44  skasper:  csce322h0mework02part01.js  - OK
17  03/02/2017  17:06:48  skasper:  csce322h0mework02part01.js  - OK
18  03/02/2017  17:39:46  skasper:  csce322h0mework02part01.js  - OK
19  03/02/2017  17:44:03  skasper:  csce322h0mework02part01.js  - OK
20  03/02/2017  17:45:39  skasper:  csce322h0mework02part01.js  - OK
21  03/02/2017  17:52:39  skasper:  csce322h0mework02part01.js  - OK
22  03/02/2017  17:59:01  skasper:  csce322h0mework02part01.js  - OK
23  03/02/2017  18:02:45  skasper:  csce322h0mework02part01.js  - OK
24  03/02/2017  18:05:06  skasper:  csce322h0mework02part01.js  - OK
25  03/02/2017  18:29:45  skasper:  csce322h0mework02part01.js  - OK
26  03/02/2017  18:31:43  skasper:  csce322h0mework02part01.js  - OK
27  03/02/2017  18:43:13  skasper:  csce322h0mework02part01.js  - OK
28  03/02/2017  18:45:05  skasper:  csce322h0mework02part01.js  - OK
29  03/02/2017  18:46:19  skasper:  csce322h0mework02part01.js  - OK
30  03/02/2017  18:48:42  skasper:  csce322h0mework02part01.js  - OK
31  03/02/2017  18:53:29  skasper:  csce322h0mework02part01.js  - OK
32  03/02/2017  19:00:19  skasper:  csce322h0mework02part01.js  - OK
33  03/02/2017  19:02:18  skasper:  csce322h0mework02part01.js  - OK
34  03/02/2017  19:03:58  skasper:  csce322h0mework02part01.js  - OK
35  03/02/2017  19:07:32  skasper:  csce322h0mework02part03.js  - OK
36  03/02/2017  19:11:12  skasper:  csce322h0mework02part02.js  - OK
37  03/02/2017  19:18:40  skasper:  csce322h0mework02part02.js  - OK
38  03/02/2017  22:12:07  skasper:  csce322h0mework02part04.js  - OK
39  03/02/2017  22:15:59  skasper:  csce322h0mework02part04.js  - OK
40  03/02/2017  22:18:48  skasper:  csce322h0mework02part04.js  - OK
41  03/02/2017  22:20:33  skasper:  csce322h0mework02part04.js  - OK
```

```
42  03/02/2017 22:22:40 skasper: csce322h0mework02part04.js  - OK
43  03/02/2017 22:27:50 skasper: csce322h0mework02part04.js  - OK
44  03/02/2017 22:27:56 skasper: csce322h0mework02part03.js  - OK
45  03/02/2017 22:27:59 skasper: csce322h0mework02part02.js  - OK
46  03/02/2017 22:28:02 skasper: csce322h0mework02part01.js  - OK
47  03/03/2017 19:01:59 skasper: csce322h0mework02part04.js  - OK
```

2.2   webgrader Runs

<div align="center">webgrader.time</div>

```
 1  2017-03-02T16:07:09-0600 76.84.143.92   skasper 0002
 2  2017-03-02T16:13:06-0600 76.84.143.92   skasper 0002
 3  2017-03-02T16:15:43-0600 76.84.143.92   skasper 0002
 4  2017-03-02T16:17:28-0600 76.84.143.92   skasper 0002
 5  2017-03-02T16:20:52-0600 76.84.143.92   skasper 0002
 6  2017-03-02T16:26:57-0600 76.84.143.92   skasper 0002
 7  2017-03-02T16:32:41-0600 76.84.143.92   skasper 0002
 8  2017-03-02T16:49:46-0600 76.84.143.92   skasper 0002
 9  2017-03-02T16:52:16-0600 76.84.143.92   skasper 0002
10  2017-03-02T16:55:08-0600 76.84.143.92   skasper 0002
11  2017-03-02T16:57:46-0600 76.84.143.92   skasper 0002
12  2017-03-02T17:00:47-0600 76.84.143.92   skasper 0002
13  2017-03-02T17:08:32-0600 76.84.143.92   skasper 0002
14  2017-03-02T17:39:50-0600 129.93.4.21   skasper 0002
15  2017-03-02T17:44:06-0600 129.93.4.21   skasper 0002
16  2017-03-02T17:45:43-0600 129.93.4.21   skasper 0002
17  2017-03-02T17:52:47-0600 129.93.4.21   skasper 0002
18  2017-03-02T17:59:04-0600 129.93.4.21   skasper 0002
19  2017-03-02T18:02:49-0600 129.93.4.21   skasper 0002
20  2017-03-02T18:05:10-0600 129.93.4.21   skasper 0002
21  2017-03-02T18:29:49-0600 129.93.4.21   skasper 0002
22  2017-03-02T18:31:47-0600 129.93.4.21   skasper 0002
23  2017-03-02T18:43:16-0600 129.93.4.21   skasper 0002
24  2017-03-02T18:45:11-0600 129.93.4.21   skasper 0002
25  2017-03-02T18:46:22-0600 129.93.4.21   skasper 0002
26  2017-03-02T18:48:47-0600 129.93.4.21   skasper 0002
27  2017-03-02T18:53:33-0600 129.93.4.21   skasper 0002
28  2017-03-02T19:00:23-0600 129.93.4.21   skasper 0002
29  2017-03-02T19:02:22-0600 129.93.4.21   skasper 0002
30  2017-03-02T19:04:02-0600 129.93.4.21   skasper 0002
31  2017-03-02T19:07:37-0600 129.93.4.21   skasper 0002
32  2017-03-02T19:11:43-0600 129.93.4.21   skasper 0002
33  2017-03-02T19:18:44-0600 129.93.4.21   skasper 0002
34  2017-03-02T22:12:13-0600 76.84.143.92   skasper 0002
35  2017-03-02T22:16:03-0600 76.84.143.92   skasper 0002
36  2017-03-02T22:18:52-0600 76.84.143.92   skasper 0002
37  2017-03-02T22:20:36-0600 76.84.143.92   skasper 0002
38  2017-03-02T22:22:45-0600 76.84.143.92   skasper 0002
39  2017-03-02T22:28:07-0600 76.84.143.92   skasper 0002
40  2017-03-03T02:15:53-0600 76.84.143.92   skasper 0002
41  2017-03-03T16:08:49-0600 129.93.4.26   skasper 0002
42  2017-03-03T19:02:24-0600 76.84.143.92   skasper 0002
43  2017-03-03T19:06:09-0600 76.84.143.92   skasper 0002
```

2.3   diffs

<div align="center">submission.diffs</div>

Chapter 3

csce322h0mework02part01.js

3.1 part01test01

3.1.1 Diff

3.1.2 Input File

part01test01.moves.bff

```
34,33,29,24,21,20,14,13,12,11,9,6,4
```

part01test01.game.bff

```
2,3,2,1,3,3
3,2,3,3,3,3
1,2,3,3,3,1
1,2,2,1,2,3
3,1,3,1,1,2
2,3,1,3,2,1
1,1,3,3,2,1
2,3,3,1,2,3
2,1,2,1,3,1
3,2,3,1,2,2
```

3.1.3 Submission Output

part01test01.output

```
 1  232133
 2  323333
 3  123331
 4  122123
 5  313112
 6  231321
 7  113321
 8  233123
 9  212131
10  323122
11  --------------------
12  232133
13  323333
14  123331
15  122123
16  313112
17  231321
18  113321
```

```
19  233123
20  212131
21  323111
```

3.1.4 Solution Output

```
 1  232133
 2  323333
 3  123331
 4  122123
 5  313112
 6  231321
 7  113321
 8  233123
 9  212131
10  323122
11  --------------------
12  232133
13  323333
14  123331
15  122123
16  313112
17  231321
18  113321
19  233123
20  212131
21  323111
```

3.1.5 stderr

3.2 part01test02

3.2.1 Diff

3.2.2 Input File

```
74,73,65,61,58,56,55,53,48,39,29,26,19,18,17,16,7
```

```
2,3,1,3,2,1,3,1,2,3,3,1,1
2,1,1,3,1,2,2,2,2,1,1,3,1
1,1,3,3,3,2,1,2,2,1,3,2,1
3,3,1,2,2,2,3,3,3,1,3,2,2
2,1,3,2,3,3,2,1,1,3,2,1,1
2,2,2,2,3,2,2,3,1,3,1,2,1
3,1,3,3,2,2,1,1,3,3,3,1,1
2,3,2,3,1,3,1,1,2,3,3,2,2
2,2,2,1,2,3,1,1,3,2,3,2,3
1,2,2,2,3,1,2,2,2,3,2,3,3
3,1,2,1,3,2,2,2,3,2,2,1,3
3,1,2,2,2,3,1,1,1,1,3,1,1
1,3,3,3,2,3,3,1,3,2,3,3,1
1,2,3,3,3,3,1,2,2,3,3,2,3
3,1,1,2,1,1,1,1,3,2,3,3,1
```

3.2.3 Submission Output

```
 1  2313213123311
 2  2113122221131
 3  1133321221321
 4  3312223331322
 5  2132332113211
 6  2222322313121
 7  3133221133311
 8  2323131123322
 9  2221231132323
10  1222312223233
11  3121322232213
12  3122231111311
13  1333233132331
14  1233331223323
15  3112111132331
16  --------------------
17  2313213123311
18  2113122221131
19  1133321221321
20  3312223331322
21  2132332113211
22  2222322313121
23  3133221133311
24  2323131123322
25  2221231132323
26  1222312223233
27  3121322232213
28  3122231111311
29  1333233132331
30  1233331223323
31  3112111132331
```

3.2.4 Solution Output

part01test02.solution

```
 1  2313213123311
 2  2113122221131
 3  1133321221321
 4  3312223331322
 5  2132332113211
 6  2222322313121
 7  3133221133311
 8  2323131123322
 9  2221231132323
10  1222312223233
11  3121322232213
12  3122231111311
13  1333233132331
14  1233331223323
15  3112111132331
16  --------------------
17  2313213123311
18  2113122221131
19  1133321221321
20  3312223331322
21  2132332113211
22  2222322313121
```

17

```
23  3133221133311
24  2323131123322
25  2221231132323
26  1222312223233
27  3121322232213
28  3122231111311
29  1333233132331
30  1233331223323
31  3112111132331
```

3.2.5 stderr

part01test02.err

3.3 part01test03

3.3.1 Diff

part01test03.diff

3.3.2 Input File

part01test03.moves.bff

```
25
```

part01test03.game.bff

```
3,4,3,4,1,3,2
3,3,1,3,1,2,3
4,4,2,3,1,3,3
2,1,4,4,3,3,1
3,1,2,3,1,4,3
3,3,4,1,3,2,2
1,1,2,2,3,2,2
2,1,4,2,4,2,3
4,2,4,4,4,4,3
4,3,3,1,3,3,3
2,3,3,2,1,1,3
1,1,2,1,4,2,1
3,4,3,2,1,4,3
1,4,2,4,3,2,3
4,1,3,3,2,1,1
```

3.3.3 Submission Output

part01test03.output

```
 1  3434132
 2  3313123
 3  4423133
 4  2144331
 5  3123143
 6  3341322
 7  1122322
 8  2142423
 9  4244443
10  4331333
11  2332113
12  1121421
13  3432143
14  1424323
```

```
15  4133211
16  --------------------
17  3434132
18  3313123
19  4423133
20  2144331
21  3123143
22  3341322
23  1122322
24  2142423
25  4244443
26  4331333
27  2332113
28  1121421
29  3432143
30  1424323
31  4133211
```

3.3.4   Solution Output

part01test03.solution

```
 1  3434132
 2  3313123
 3  4423133
 4  2144331
 5  3123143
 6  3341322
 7  1122322
 8  2142423
 9  4244443
10  4331333
11  2332113
12  1121421
13  3432143
14  1424323
15  4133211
16  --------------------
17  3434132
18  3313123
19  4423133
20  2144331
21  3123143
22  3341322
23  1122322
24  2142423
25  4244443
26  4331333
27  2332113
28  1121421
29  3432143
30  1424323
31  4133211
```

3.3.5   stderr

part01test03.err

3.4   part01test04

3.4.1   Diff

3.4.2 Input File

56,55,54,52,50,48,46,45,44,43,42,41,40,39,37,35,34,33,31,30,29,28,26,25,24,23,22,21,20,19,18

```
3,3,2,2,3,2,2,3,1,1,1
2,3,2,3,3,1,3,3,1,3,3
3,1,1,2,2,2,3,1,2,2,1
2,1,1,1,1,3,1,1,3,1,1
2,3,1,1,1,2,1,3,2,2,3
1,3,2,1,1,2,2,2,3,3,1
1,3,3,3,1,1,2,1,2,2,3
3,2,1,2,2,3,2,3,3,3,1
3,2,3,1,2,3,2,2,3,2,1
2,2,2,3,3,3,1,1,2,2,2
1,1,1,2,3,3,3,2,2,1,2
2,3,2,2,3,1,3,2,1,1,3
3,1,3,2,1,3,3,2,1,1,3
1,2,2,2,3,1,2,1,1,2,3
```

3.4.3 Submission Output

```
 1  33223223111
 2  23233133133
 3  31122231221
 4  21111311311
 5  23111213223
 6  13211222331
 7  13331121223
 8  32122323331
 9  32312322321
10  22233311222
11  11123332212
12  23223132113
13  31321332113
14  12223121123
15  --------------------
16  33223223111
17  23233133133
18  31122231221
19  21111311311
20  23111213223
21  13211222331
22  13331121223
23  32122323331
24  32312322321
25  22233311222
26  11123332212
27  23223132113
28  31321332113
29  12223111123
```

3.4.4 Solution Output

```
 1  33223223111
 2  23233133133
 3  31122231221
 4  21111311311
 5  23111213223
 6  13211222331
 7  13331121223
 8  32122323331
 9  32312322321
10  22233311222
11  11123332212
12  23223132113
13  31321332113
14  12223121123
15  --------------------
16  33223223111
17  23233133133
18  31122231221
19  21111311311
20  23111213223
21  13211222331
22  13331121223
23  32122323331
24  32312322321
25  22233311222
26  11123332212
27  23223132113
28  31321332113
29  12223111123
```

3.4.5 stderr

3.5 part01test05

3.5.1 Diff

3.5.2 Input File

```
31,29,27,26,23,22,20,17,16,12,10,9,8,2
```

```
2,1,2,1,1,1,1,2,2,1,2,1
1,2,1,2,1,1,1,1,1,2,2,1
1,2,2,1,2,1,2,1,1,1,2,1
1,1,2,1,2,2,2,1,2,1,1,2
1,1,2,2,1,2,1,2,1,1,1,1
1,1,1,1,2,1,1,2,2,1,2,1
2,2,2,2,1,2,1,1,2,2,1,2
1,1,2,2,2,2,1,1,2,2,1,1
2,2,2,1,1,2,1,1,2,1,2,2
1,1,2,2,1,2,2,2,2,2,2,2
2,2,1,2,2,1,2,1,1,1,1,1
```

3.5.3   Submission Output

```
 1  212111122121
 2  121211111221
 3  122121211121
 4  112122212112
 5  112212121111
 6  111121122121
 7  222212112212
 8  112222112211
 9  222112112122
10  112212222222
11  221221211111
12  --------------------
13  212111122121
14  121211111221
15  122121211121
16  112122212112
17  112212121111
18  111121122121
19  222212112212
20  112222112211
21  222112112122
22  112212222222
23  221221211111
```

3.5.4   Solution Output

```
 1  212111122121
 2  121211111221
 3  122121211121
 4  112122212112
 5  112212121111
 6  111121122121
 7  222212112212
 8  112222112211
 9  222112112122
10  112212222222
11  221221211111
12  --------------------
13  212111122121
14  121211111221
15  122121211121
16  112122212112
17  112212121111
18  111121122121
19  222212112212
20  112222112211
21  222112112122
22  112212222222
23  221221211111
```

3.5.5   stderr

3.6 part01test06

3.6.1 Diff

3.6.2 Input File

```
26,25,24,23,22,21,19,18,17,16,15,14,13,12,11,10,9,8,7,5,4,3,2
```

```
3,2,1,3,3,2
3,2,2,3,2,2
1,1,1,1,1,1
1,3,1,1,3,1
1,2,3,2,3,3
3,3,2,2,1,1
3,1,2,2,2,3
1,2,3,3,2,2
1,3,2,2,1,2
3,3,1,2,3,2
1,1,3,3,3,1
1,3,3,2,3,3
```

3.6.3 Submission Output

```
 1  321332
 2  322322
 3  111111
 4  131131
 5  123233
 6  332211
 7  312223
 8  123322
 9  132212
10  331232
11  113331
12  133233
13  --------------------
14  321332
15  322322
16  111111
17  131131
18  123233
19  332211
20  312223
21  123322
22  132212
23  331232
24  113331
25  133133
```

3.6.4 Solution Output

```
 1  321332
 2  322322
```

23

```
 3  111111
 4  131131
 5  123233
 6  332211
 7  312223
 8  123322
 9  132212
10  331232
11  113331
12  133233
13  --------------------
14  321332
15  322322
16  111111
17  131131
18  123233
19  332211
20  312223
21  123322
22  132212
23  331232
24  113331
25  133133
```

3.6.5 stderr

part01test06.err

3.7 part01test07

3.7.1 Diff

part01test07.diff

3.7.2 Input File

part01test07.moves.bff

```
31,30,26
```

part01test07.game.bff

```
2,2,2,1,3,3
3,3,2,2,3,1
2,3,3,1,2,1
2,1,3,3,1,2
1,2,1,1,3,3
1,1,3,1,3,1
3,2,3,1,1,1
2,2,2,3,3,2
1,3,2,2,3,1
2,1,2,1,2,1
2,3,1,3,2,1
2,3,1,1,2,3
3,1,1,3,1,2
3,2,2,3,2,2
```

3.7.3 Submission Output

part01test07.output

```
1  222133
```

24

```
 2  332231
 3  233121
 4  213312
 5  121133
 6  113131
 7  323111
 8  222332
 9  132231
10  212121
11  231321
12  231123
13  311312
14  322322
15  --------------------
16  222133
17  332231
18  233121
19  213312
20  121133
21  113131
22  323111
23  222332
24  132231
25  212121
26  231321
27  231121
28  311312
29  322322
```

3.7.4   Solution Output

part01test07.solution

```
 1  222133
 2  332231
 3  233121
 4  213312
 5  121133
 6  113131
 7  323111
 8  222332
 9  132231
10  212121
11  231321
12  231123
13  311312
14  322322
15  --------------------
16  222133
17  332231
18  233121
19  213312
20  121133
21  113131
22  323111
23  222332
24  132231
25  212121
26  231321
27  231121
28  311312
```

29 322322

part01test07.err

3.8 part01test08

3.8.1 Diff

part01test08.diff

3.8.2 Input File

part01test08.moves.bff

```
74 ,73 ,72 ,71 ,70 ,69 ,66 ,65 ,64 ,62 ,61 ,60 ,59 ,58 ,56 ,55 ,53 ,51 ,49 ,48 ,46 ,45 ,44 ,42 ,41 ,40 ,39 ,36 ,34 ,33 ,32
```

part01test08.game.bff

```
4 ,1 ,1 ,1 ,4 ,4 ,1 ,2 ,1 ,1
4 ,1 ,3 ,4 ,1 ,1 ,2 ,2 ,2 ,4
1 ,4 ,4 ,2 ,2 ,1 ,2 ,4 ,4 ,2
4 ,2 ,4 ,4 ,2 ,3 ,4 ,3 ,4 ,3
1 ,3 ,1 ,3 ,3 ,1 ,1 ,2 ,2 ,1
1 ,1 ,2 ,3 ,4 ,1 ,2 ,4 ,1 ,4
1 ,1 ,3 ,3 ,1 ,4 ,3 ,4 ,2 ,2
1 ,2 ,3 ,2 ,2 ,1 ,2 ,4 ,4 ,2
1 ,2 ,3 ,3 ,4 ,2 ,2 ,3 ,4 ,4
4 ,2 ,4 ,3 ,2 ,1 ,3 ,3 ,2 ,2
3 ,1 ,4 ,3 ,3 ,3 ,3 ,3 ,1 ,2
4 ,1 ,2 ,4 ,4 ,4 ,4 ,3 ,2 ,3
3 ,2 ,3 ,2 ,1 ,1 ,2 ,2 ,4 ,4
2 ,1 ,3 ,3 ,3 ,3 ,4 ,1 ,4 ,3
2 ,4 ,2 ,4 ,4 ,3 ,3 ,4 ,3 ,4
```

3.8.3 Submission Output

part01test08.output

```
 1  4111441211
 2  4134112224
 3  1442212442
 4  4244234343
 5  1313311221
 6  1123412414
 7  1133143422
 8  1232212442
 9  1233422344
10  4243213322
11  3143333312
12  4124444323
13  3232112244
14  2133334143
15  2424433434
16  --------------------
17  4111441211
18  4134112224
19  1442212442
20  4244234343
21  1313311221
```

```
22   1123412414
23   1133143422
24   1232212442
25   1233422344
26   4243213322
27   3143333312
28   4124444323
29   3232112244
30   2133334143
31   2424433431
```

3.8.4 Solution Output

part01test08.solution

```
 1   4111441211
 2   4134112224
 3   1442212442
 4   4244234343
 5   1313311221
 6   1123412414
 7   1133143422
 8   1232212442
 9   1233422344
10   4243213322
11   3143333312
12   4124444323
13   3232112244
14   2133334143
15   2424433434
16   --------------------
17   4111441211
18   4134112224
19   1442212442
20   4244234343
21   1313311221
22   1123412414
23   1133143422
24   1232212442
25   1233422344
26   4243213322
27   3143333312
28   4124444323
29   3232112244
30   2133334143
31   2424433431
```

3.8.5 stderr

part01test08.err

3.9 part01test09

3.9.1 Diff

part01test09.diff

3.9.2 Input File

part01test09.moves.bff

```
45,40,35,32,27,25,22,21,19,11,9,5,3
```

27

```
1,3,2,2,3,1,2,2,3
1,2,1,1,2,3,1,1,2
2,2,2,3,1,3,3,1,2
3,3,2,1,1,3,2,1,2
1,3,3,2,1,3,2,2,2
3,1,3,2,3,3,3,3,3
3,2,3,3,3,2,1,2,1
1,3,1,1,3,1,2,2,1
3,1,2,1,2,1,2,2,2
1,2,3,3,1,1,2,3,1
1,3,3,2,3,2,1,3,3
2,3,2,2,1,3,2,3,1
3,2,3,1,2,3,1,1,3
```

3.9.3 Submission Output

```
1   132231223
2   121123112
3   222313312
4   332113212
5   133213222
6   313233333
7   323332121
8   131131221
9   312121222
10  123311231
11  133232133
12  232213231
13  323123113
14  --------------------
15  132231223
16  121123112
17  222313312
18  332113212
19  133213222
20  313233333
21  323332121
22  131131221
23  312121222
24  123311231
25  133232133
26  232213131
27  323123113
```

3.9.4 Solution Output

```
1   132231223
2   121123112
3   222313312
4   332113212
5   133213222
6   313233333
7   323332121
8   131131221
9   312121222
10  123311231
11  133232133
```

28

```
12  232213231
13  323123113
14  --------------------
15  132231223
16  121123112
17  222313312
18  332113212
19  133213222
20  313233333
21  323332121
22  131131221
23  312121222
24  123311231
25  133232133
26  232213131
27  323123113
```

3.9.5 stderr

3.10 part01test10

3.10.1 Diff

3.10.2 Input File

```
11,6,2
```

```
1,1,2,1,2,1
2,2,2,1,2,2
2,1,1,2,1,2
1,1,2,2,1,2
2,2,1,2,1,2
1,2,1,1,1,2
1,1,1,2,2,1
2,1,1,2,2,1
```

3.10.3 Submission Output

```
 1  112121
 2  222122
 3  211212
 4  112212
 5  221212
 6  121112
 7  111221
 8  211221
 9  --------------------
10  112121
11  222122
12  211212
13  112212
14  221212
```

```
15   121112
16   111221
17   211221
```

3.10.4   Solution Output

```
1   112121
2   222122
3   211212
4   112212
5   221212
6   121112
7   111221
8   211221
9   --------------------
10   112121
11   222122
12   211212
13   112212
14   221212
15   121112
16   111221
17   211221
```

3.10.5   stderr

3.11   part01test11

3.11.1   Diff

3.11.2   Input File

```
81,80,79,77,75,73,70,68,67,66,65,64,63,61,59,58,57,56,55,54,53,49,48,46,45,44,42,41,39,38,37
```

```
3,2,1,2,3,3,2,1,1,4,3,4,4,3
4,4,1,1,3,3,1,4,3,4,1,4,1,1
3,4,2,3,3,4,4,4,4,1,4,2,4,2
3,4,1,3,1,2,3,3,2,1,3,3,1,2
2,3,2,4,1,2,1,3,1,1,2,2,1,4
3,3,4,2,2,4,1,4,2,3,4,1,1,2
3,2,4,2,1,4,3,4,1,2,3,3,3,1
2,2,2,3,1,4,2,1,4,4,4,4,2,2
4,1,2,2,3,1,1,3,2,1,3,4,1,1
1,2,4,4,1,1,1,4,1,2,2,4,4,1
2,1,1,2,1,2,1,2,1,2,3,3,1,2
```

3.11.3   Submission Output

```
1   32123321143443
2   44113314341411
```

30

```
 3  34233444414242
 4  3413123 3213312
 5  23241213112214
 6  33422414234112
 7  32421434123331
 8  22231421444422
 9  41223113213411
10  12441114122441
11  21121212123312
12  --------------------
13  32123321143443
14  44113314341411
15  34233444414242
16  3413123 3213312
17  23241213112214
18  33422414234112
19  32421434123331
20  22231421444422
21  41223113213411
22  12441114122441
23  21121212123311
```

3.11.4 Solution Output

```
 1  32123321143443
 2  44113314341411
 3  34233444414242
 4  3413123 3213312
 5  23241213112214
 6  33422414234112
 7  32421434123331
 8  22231421444422
 9  41223113213411
10  12441114122441
11  21121212123312
12  --------------------
13  32123321143443
14  44113314341411
15  34233444414242
16  3413123 3213312
17  23241213112214
18  33422414234112
19  32421434123331
20  22231421444422
21  41223113213411
22  12441114122441
23  21121212123311
```

3.11.5 stderr

3.12 part01test12

3.12.1 Diff

3.12.2 Input File
```

51,48,34,31,29,28,27,25,23,22,20,16,13,9,8,7,4

3,2,2,3,2,3,3,3
2,3,3,2,1,2,1,3
1,3,1,3,3,2,3,1
3,1,2,3,2,2,1,3
3,3,3,1,1,3,1,3
1,3,3,3,2,3,3,3
3,3,2,2,3,3,1,2
2,1,3,1,1,3,2,1
1,2,3,3,2,3,1,2
2,1,2,1,2,1,2,3
2,3,3,2,3,2,1,3
3,2,2,1,3,1,1,2

### 3.12.3 Submission Output

```
 1  32232333
 2  23321213
 3  13133231
 4  31232213
 5  33311313
 6  13332333
 7  33223312
 8  21311321
 9  12332312
10  21212123
11  23323213
12  32213112
13  --------------------
14  32232333
15  23321213
16  13133231
17  31232213
18  33311313
19  13332333
20  33223312
21  21311321
22  12332312
23  21212123
24  23323213
25  12213112
```

3.12.4 Solution Output

```
 1  32232333
 2  23321213
 3  13133231
 4  31232213
 5  33311313
 6  13332333
 7  33223312
 8  21311321
 9  12332312
10  21212123
```

```
11   23323213
12   32213112
13   --------------------
14   32232333
15   23321213
16   13133231
17   31232213
18   33311313
19   13332333
20   33223312
21   21311321
22   12332312
23   21212123
24   23323213
25   12213112
```

3.12.5 stderr

part01test12.err

3.13 part01test13

3.13.1 Diff

part01test13.diff

3.13.2 Input File

part01test13.moves.bff

53,51,50,49,48,47,45,43,41,40,37,35,34,32,30,29,24,23,22,20,18,15,14,10,9,4,3,2,1

part01test13.game.bff

```
3,1,2,4,1,3,4
1,3,1,3,2,1,2
2,2,2,4,4,1,3
1,1,3,4,2,4,4
1,4,4,1,1,2,4
4,4,4,3,3,1,3
4,3,3,1,1,3,1
1,2,3,3,2,4,1
2,3,3,3,3,1,1
3,1,2,3,1,4,1
1,2,2,4,4,4,4
2,1,2,2,4,3,2
3,2,1,3,1,1,1
3,4,4,4,4,3,4
```

3.13.3 Submission Output

part01test13.output

```
1   3124134
2   1313212
3   2224413
4   1134244
5   1441124
6   4443313
7   4331131
8   1233241
9   2333311
```

```
10  3123141
11  1224444
12  2122432
13  3213111
14  3444434
15  --------------------
16  3124134
17  1313212
18  2224413
19  1134244
20  1441124
21  4443313
22  4331131
23  1233241
24  2333311
25  3123141
26  1224444
27  2122432
28  3213111
29  3444414
```

3.13.4   Solution Output

```
 1  3124134
 2  1313212
 3  2224413
 4  1134244
 5  1441124
 6  4443313
 7  4331131
 8  1233241
 9  2333311
10  3123141
11  1224444
12  2122432
13  3213111
14  3444434
15  --------------------
16  3124134
17  1313212
18  2224413
19  1134244
20  1441124
21  4443313
22  4331131
23  1233241
24  2333311
25  3123141
26  1224444
27  2122432
28  3213111
29  3444414
```

3.13.5   stderr

3.14 part01test14

3.14.1 Diff

3.14.2 Input File

52,51,50,49,47,45,39,38,37,36,34,25,20,19,18,14,13,12,11,10,9,8,7,3

```
2,3,1,1,2,2,2,3,2,2,1
2,1,2,2,3,1,3,1,3,2,2
1,3,3,3,3,2,3,1,3,3,1
1,2,1,2,3,3,1,1,2,2,1
3,1,3,1,2,1,3,2,2,1,1
3,2,2,1,3,1,2,2,1,3,3
2,3,3,1,3,3,2,2,3,2,2
2,1,1,1,1,3,2,2,1,2,1
2,2,3,2,2,3,2,3,2,1,3
2,2,2,3,2,1,3,1,2,2,1
2,1,3,3,3,2,3,1,2,1,2
```

3.14.3 Submission Output

```
1   23112223221
2   21223131322
3   13333231331
4   12123311221
5   31312132211
6   32213122133
7   23313322322
8   21111322121
9   22322323213
10  22232131221
11  21333231212
12  --------------------
13  23112223221
14  21223131322
15  13333231331
16  12123311221
17  31312132211
18  32213122133
19  23313322322
20  21111322121
21  22322323213
22  22232131221
23  21333231212
```

3.14.4 Solution Output

```
1   23112223221
2   21223131322
3   13333231331
4   12123311221
5   31312132211
```

```
 6  32213122133
 7  23313322322
 8  21111322121
 9  22322323213
10  22232131221
11  21333231212
12  --------------------
13  23112223221
14  21223131322
15  13333231331
16  12123311221
17  31312132211
18  32213122133
19  23313322322
20  21111322121
21  22322323213
22  22232131221
23  21333231212
```

3.14.5 stderr

<div align="center">part01test14.err</div>

3.15 part01test15

3.15.1 Diff

<div align="center">part01test15.diff</div>

3.15.2 Input File

<div align="center">part01test15.moves.bff</div>

```
41,39,38,37,36,35,34,33,31,30,29,27,26,24,23,22,20,18,17,16,15,12,11,9,7,6,5,4,3
```

<div align="center">part01test15.game.bff</div>

```
2,1,3,2,1,1,3,2
3,3,1,1,1,1,1,2
1,3,3,1,3,3,3,1
2,1,1,3,3,1,1,1
3,2,1,2,2,3,1,2
2,2,2,1,1,1,2,1
3,3,1,3,3,3,2,1
3,1,1,1,1,1,3,3
1,3,1,1,2,2,2,1
3,2,3,1,2,3,1,2
3,1,3,1,3,3,1,1
2,1,1,2,2,3,3,3
3,2,1,1,3,2,3,1
```

3.15.3 Submission Output

<div align="center">part01test15.output</div>

```
1  21321132
2  33111112
3  13313331
4  21133111
5  32122312
6  22211121
7  33133321
```

```
 8  31111133
 9  13112221
10  32312312
11  31313311
12  21122333
13  32113231
14  --------------------
15  21321132
16  33111112
17  13313331
18  21133111
19  32122312
20  22211121
21  33133321
22  31111133
23  13112221
24  32312312
25  31313311
26  21122333
27  32111231
```

3.15.4   Solution Output

```
 1  21321132
 2  33111112
 3  13313331
 4  21133111
 5  32122312
 6  22211121
 7  33133321
 8  31111133
 9  13112221
10  32312312
11  31313311
12  21122333
13  32113231
14  --------------------
15  21321132
16  33111112
17  13313331
18  21133111
19  32122312
20  22211121
21  33133321
22  31111133
23  13112221
24  32312312
25  31313311
26  21122333
27  32111231
```

3.15.5   stderr

3.16   part01test16

3.16.1   Diff

3.16.2 Input File

29 ,28 ,27 ,26 ,25 ,20 ,18 ,16 ,13 ,11 ,10 ,9 ,8 ,7 ,6 ,5 ,4

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

3.16.3 Submission Output

```
 1  1121121222111
 2  2211122211212
 3  1212121211121
 4  2111111111111
 5  1222211212111
 6  1121221111211
 7  1112222212111
 8  1222212122122
 9  1112222212121
10  2212212222122
11  2111111222122
12  1211121111222
13  2211122211221
14  2221121222222
15  --------------------
16  1121121222111
17  2211122211212
18  1212121211121
19  2111111111111
20  1222211212111
21  1121221111211
22  1112222212111
23  1222212122122
24  1112222212121
25  2212212222122
26  2111111222122
27  1211121111222
28  2211122211221
29  2221121222222
```

3.16.4 Solution Output

```
 1  1121121222111
 2  2211122211212
 3  1212121211121
 4  2111111111111
 5  1222211212111
 6  1121221111211
 7  1112222212111
 8  1222212122122
 9  1112222212121
10  2212212222122
11  2111111222122
12  1211121111222
13  2211122211221
14  2221121222222
15  --------------------
16  1121121222111
17  2211122211212
18  1212121211121
19  2111111111111
20  1222211212111
21  1121221111211
22  1112222212111
23  1222212122122
24  1112222212121
25  2212212222122
26  2111111222122
27  1211121111222
28  2211122211221
29  2221121222222
```

3.16.5 stderr

3.17 part01test17

3.17.1 Diff

3.17.2 Input File

```
91,90,89,88,87,86,85,84,81,80,79,77,76,74,73,70,69,68,67,66,65,64,63,62,61,60,59,58,57,56,55
```

```
2,3,3,2,3,3,2,3,2,1,3,1,3
3,3,2,3,3,1,1,2,1,2,3,2,1
1,2,1,2,1,2,1,1,3,2,2,3,3
2,2,2,2,1,3,3,1,3,2,1,1,2
2,3,3,1,1,2,2,2,2,3,2,3,1
1,3,1,2,2,1,1,3,3,1,2,3,1
1,2,3,3,3,2,1,2,1,3,3,3,2
1,3,1,3,2,2,1,2,3,1,2,3,3
3,2,3,1,3,3,2,2,2,3,1,3,2
1,3,2,1,1,1,3,3,3,1,2,1,3
2,3,1,3,3,3,2,2,3,1,3,1,3
```

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```
2,2,3,1,1,2,3,3,1,1,2,3,1
1,2,3,1,2,1,2,3,1,1,3,1,2
3,3,1,3,3,3,2,2,3,2,1,1,2
```

3.17.3 Submission Output

```
 1   2332332321313
 2   3323311212321
 3   1212121132233
 4   2222133132112
 5   2331122223231
 6   1312211331231
 7   1233321213332
 8   1313221231233
 9   3231332223132
10   1321113331213
11   2313332231313
12   2231123311231
13   1231212311312
14   3313332232112
15   --------------------
16   2332332321313
17   3323311212321
18   1212121132233
19   2222133132112
20   2331122223231
21   1312211331231
22   1233321213332
23   1313221231233
24   3231332223132
25   1321113331213
26   2313332231313
27   2231123311231
28   1231212311312
29   3313332231112
```

3.17.4 Solution Output

```
 1   2332332321313
 2   3323311212321
 3   1212121132233
 4   2222133132112
 5   2331122223231
 6   1312211331231
 7   1233321213332
 8   1313221231233
 9   3231332223132
10   1321113331213
11   2313332231313
12   2231123311231
13   1231212311312
14   3313332232112
15   --------------------
16   2332332321313
17   3323311212321
18   1212121132233
19   2222133132112
20   2331122223231
```

```
21  1312211331231
22  1233321213332
23  1313221231233
24  3231332223132
25  1321113331213
26  2313332231313
27  2231123311231
28  1231212311312
29  3313332231112
```

3.17.5 stderr

part01test17.err

3.18 part01test18

3.18.1 Diff

part01test18.diff

3.18.2 Input File

part01test18.moves.bff

```
24,20,18,17,16,6,5,2,1
```

part01test18.game.bff

```
3,3,4,2,3,2,4,2
3,3,1,2,4,1,1,4
1,3,2,2,4,3,2,2
2,2,3,3,1,1,3,1
4,3,4,4,1,1,1,1
4,2,4,1,1,4,3,1
```

3.18.3 Submission Output

part01test18.output

```
 1  33423242
 2  33124114
 3  13224322
 4  22331131
 5  43441111
 6  42411431
 7  --------------------
 8  33423242
 9  33124114
10  13224322
11  22331131
12  43441111
13  42411411
```

3.18.4 Solution Output

part01test18.solution

```
 1  33423242
 2  33124114
 3  13224322
 4  22331131
 5  43441111
 6  42411431
```

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```
 7   --------------------
 8   33423242
 9   33124114
10   13224322
11   22331131
12   43441111
13   42411411
```

3.18.5 stderr

3.19 part01test19

3.19.1 Diff

3.19.2 Input File

```
103,92,64,45,24,18,16
```

```
4,3,1,2,4,2,1,2,4,2,1,3,2,1
4,2,1,2,4,1,1,2,3,1,3,1,3,2
2,3,4,3,3,3,2,3,3,4,1,1,2,1
3,3,4,4,2,4,1,1,1,1,2,2,2,2
4,3,4,2,4,2,4,4,1,3,2,4,4,2
1,2,2,3,1,3,1,2,3,3,3,1,2,4
4,2,1,3,2,4,2,2,3,3,3,3,2,1
1,4,2,1,1,3,3,3,1,1,1,1,2,4
4,2,2,4,3,1,2,4,2,3,3,2,1,2
4,4,2,3,2,3,3,4,1,1,4,2,2,2
1,2,2,1,4,1,2,2,2,4,2,1,3,1
1,3,2,2,2,2,1,4,4,3,3,1,2,2
3,3,1,2,1,1,4,1,4,1,3,2,3,1
1,3,4,2,1,3,2,2,4,1,1,4,2,3
```

3.19.3 Submission Output

```
 1   43124212421321
 2   42124112313132
 3   23433323341121
 4   33442411112222
 5   43424244132442
 6   12231312333124
 7   42132422333321
 8   14211333111124
 9   42243124233212
10   44232334114222
11   12214122242131
12   13222214433122
13   33121141413231
14   13421322411423
15   --------------------
16   43124212421321
17   42124112313132
```

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```
18  23433323341121
19  33442411112222
20  43424244132442
21  12231312333124
22  42132422333321
23  14211333111124
24  42243124233212
25  44232334114222
26  12214122242131
27  13222214433122
28  33121141413231
29  13421311411423
```

3.19.4 Solution Output

part01test19.solution

```
 1  43124212421321
 2  42124112313132
 3  23433323341121
 4  33442411112222
 5  43424244132442
 6  12231312333124
 7  42132422333321
 8  14211333111124
 9  42243124233212
10  44232334114222
11  12214122242131
12  13222214433122
13  33121141413231
14  13421322411423
15  --------------------
16  43124212421321
17  42124112313132
18  23433323341121
19  33442411112222
20  43424244132442
21  12231312333124
22  42132422333321
23  14211333111124
24  42243124233212
25  44232334114222
26  12214122242131
27  13222214433122
28  33121141413231
29  13421311411423
```

3.19.5 stderr

part01test19.err

3.20 part01test20

3.20.1 Diff

part01test20.diff

3.20.2 Input File

part01test20.moves.bff

```
25
```

```
2,3,2,4,4,3,2
2,4,2,3,4,2,1
2,1,3,1,4,3,1
3,4,3,1,4,3,2
3,1,3,4,1,1,4
3,3,3,2,2,3,4
2,4,1,2,2,2,3
1,1,4,3,3,2,1
3,3,1,4,3,1,4
2,4,2,4,4,1,4
1,3,4,1,4,3,4
```

3.20.3 Submission Output

```
 1  2324432
 2  2423421
 3  2131431
 4  3431432
 5  3134114
 6  3332234
 7  2412223
 8  1143321
 9  3314314
10  2424414
11  1341434
12  --------------------
13  2324432
14  2423421
15  2131431
16  3431432
17  3134114
18  3332234
19  2412223
20  1143321
21  3314314
22  2424414
23  1341434
```

3.20.4 Solution Output

```
 1  2324432
 2  2423421
 3  2131431
 4  3431432
 5  3134114
 6  3332234
 7  2412223
 8  1143321
 9  3314314
10  2424414
11  1341434
12  --------------------
13  2324432
14  2423421
15  2131431
16  3431432
17  3134114
```

```
18  3332234
19  2412223
20  1143321
21  3314314
22  2424414
23  1341434
```

3.20.5 stderr

part01test20.err

3.21 Source Code

csce322h0mework02part01.js

```
1  module.exports = {
2      onePlayerOneMove: onePlayerOneMove
3  }
4
5  var helpers = require( './helpers' );
6
7  function onePlayerOneMove( game ){
8      function whatever( move ){
9                  var clusters = [];
10                 var clusterCounter = 1;
11                 var numberOfMatches = 0;
12                 var lengthOfRow = game.length;
13                 var lengthOfColumn = game[0].length;
14                 var copy = [];
15
16                 // Initialize first row
17                 clusters[0] = [];
18                 clusters[0][0] = 1;
19                 copy[0] = [];
20                 copy[0][0] = 1;
21
22                 for(var row = 1; row < lengthOfColumn; row++ ){
23                         if(game[0][row] == game[0][row-1]){
24                                 clusters[0][row] = clusterCounter;
25                                 copy[0][row] = clusterCounter;
26                         }
27
28                         else{
29                                 clusterCounter++;
30                                 clusters[0][row] = clusterCounter;
31                                 copy[0][row] = clusterCounter;
32                         }
33                 }
34
35                 // Take care of every other row
36                 for(var r = 1; r < lengthOfRow; r++){
37                         clusters[r] = [];
38                         copy[r] = [];
39
40                         for(var c = 0; c < lengthOfColumn; c++){
41
42                                 if(c == 0){
43                                         clusterCounter++;
44                                         clusters[r][c] = clusterCounter;
45                                         copy[r][c] = clusterCounter;
```

45

```
46                                              }
47                                      else if(game[r][c] == game[r][c-1]){
48                                              clusters[r][c] = clusterCounter;
49                                              copy[r][c] = clusterCounter;
50                                      }
51
52                                      else{
53                                              clusterCounter++;
54                                              clusters[r][c] = clusterCounter;
55                                              copy[r][c] = clusterCounter;
56                                      }
57                              }
58                      }
59
60              // Combine clusters with the same value
61              for(var ro = 1; ro < lengthOfRow; ro++){
62                      for(var co = 0; co < lengthOfColumn; co++){
63                              if(game[ro][co] == game[ro-1][co]){
64                                      var valueToMatch = clusters[ro][co];
65                                      var valueToTurn = clusters[ro-1][co];
66
67                                      for(var newRo = 0; newRo < lengthOfRow; newRo
    ++){
68                                              for(var newCo = 0; newCo <
    lengthOfColumn; newCo++){
69                                                      if(clusters[newRo][newCo] ==
    valueToMatch){
70                                                              clusters[newRo][newCo]
     = valueToTurn;
71                                                      }
72                                              }
73                                      }
74
75                              }
76                      }
77              }
78
79              var newClusterCounter = 1;
80
81              // Reduce cluster values
82              for(var row = 0; row < lengthOfRow; row++){
83                      for(var col = 0; col < lengthOfColumn; col++){
84                              if(copy[row][col] != null){
85                                      var searchValue = clusters[row][col];
86                                      copy[row][col] = null;
87
88                                      for(var r = 0; r < lengthOfRow; r++){
89                                              for(var c = 0; c < lengthOfColumn; c
    ++){
90                                                      if(clusters[r][c] ==
    searchValue){
91                                                              clusters[r][c] =
    newClusterCounter;
92                                                              copy[r][c] = null;
93                                                      }
94                                              }
95                                      }
96
97                                      newClusterCounter++;
98                              }
```

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```
 99                             }
100                     }
101
102                     // Find the move to make and change the cluster
103                     for(var row = 0; row < lengthOfRow; row++){
104                             for(var col = 0; col < lengthOfColumn; col++){
105
106                                     if(clusters[row][col] == move){
107                                             game[row][col] = 1;
108                                     }
109                             }
110                     }
111
112                     return game;
113             }
114
115         return whatever;
116 }
```

Chapter 4

csce322h0mework02part02.js

4.1   part02test01

4.1.1   Diff

part02test01.diff

4.1.2   Input File

part02test01.moves.bff

```
11,8
```

part02test01.game.bff

```
1,2,2,2,2,2,1,1
1,1,2,2,1,1,1,2
2,1,2,1,1,2,1,1
2,1,1,2,2,1,1,1
2,2,2,1,2,2,1,2
1,2,1,1,1,2,1,1
1,1,1,1,2,1,2,2
1,2,1,1,2,2,1,2
```

4.1.3   Submission Output

part02test01.output

```
 1  12222211
 2  11221112
 3  21211211
 4  21122111
 5  22212212
 6  12111211
 7  11112122
 8  12112212
 9  --------------------
10  12222211
11  11221112
12  21211211
13  21122111
14  22212212
15  12111211
16  11112122
17  12112212
```

4.1.4   Solution Output

```
 1  12222211
 2  11221112
 3  21211211
 4  21122111
 5  22212212
 6  12111211
 7  11112122
 8  12112212
 9  --------------------
10  12222211
11  11221112
12  21211211
13  21122111
14  22212212
15  12111211
16  11112122
17  12112212
```

4.1.5 stderr

4.2 part02test02

4.2.1 Diff

4.2.2 Input File

```
65,63,58,50,40,38,34,25,20,17,13,8
```

```
1,4,3,3,3,2,3,4,3,2,4
1,1,2,1,3,1,3,1,2,2,4
2,1,3,4,1,4,1,1,4,4,1
2,2,4,1,3,1,1,4,2,3,3
4,1,3,2,1,3,3,2,2,4,4
1,2,3,1,3,1,1,4,2,4,2
4,2,2,2,2,4,2,2,4,4,3
3,2,4,1,3,4,1,2,3,1,4
1,3,3,2,2,2,2,4,4,4,4
4,1,3,4,2,2,1,3,4,4,2
3,3,3,1,3,3,3,2,1,1,4
```

4.2.3 Submission Output

```
 1  14333234324
 2  11213131224
 3  21341411441
 4  22413114233
 5  41321332244
 6  12313114242
 7  42222422443
 8  32413412314
```

```
 9  13322224444
10  41342213442
11  33313332114
12  --------------------
13  14333234314
14  11213131114
15  21341411441
16  22413114133
17  41321331144
18  12313114141
19  42222422443
20  32413412114
21  13322224444
22  41312213442
23  33311112114
```

4.2.4 Solution Output

part02test02.solution

```
 1  14333234324
 2  11213131224
 3  21341411441
 4  22413114233
 5  41321332244
 6  12313114242
 7  42222422443
 8  32413412314
 9  13322224444
10  41342213442
11  33313332114
12  --------------------
13  14333234314
14  11213131114
15  21341411441
16  22413114133
17  41321331144
18  12313114141
19  42222422443
20  32413412114
21  13322224444
22  41312213442
23  33311112114
```

4.2.5 stderr

part02test02.err

4.3 part02test03

4.3.1 Diff

part02test03.diff

4.3.2 Input File

part02test03.moves.bff

```
23,19,13,5,3
```

```
1,1,1,1,2,2,2,2,1,2,1,1,2
1,1,1,1,1,2,2,1,1,1,1,2,1
1,2,1,1,1,2,2,1,2,1,2,1,1
2,2,2,2,1,2,1,1,2,2,2,1,2
2,2,1,1,1,1,2,1,1,1,1,2,1
2,2,1,2,1,1,1,1,2,2,1,1,2
2,1,1,1,2,1,2,1,1,1,1,1,1
2,1,1,2,2,2,2,1,2,1,2,2,1
2,2,2,1,1,2,1,2,2,2,1,2,1
1,2,2,2,1,2,1,1,2,1,2,2,2
2,2,1,1,1,2,2,1,1,1,1,1,2
2,2,2,2,2,1,1,2,2,1,2,2,2
```

4.3.3   Submission Output

```
 1  1111222212112
 2  1111122111121
 3  1211122121211
 4  2222121122212
 5  2211112111121
 6  2212111122112
 7  2111212111111
 8  2112222121221
 9  2221121222121
10  1222121121222
11  2211122111112
12  2222211221222
13  --------------------
14  1111222211112
15  1111122111111
16  1211122121211
17  2222121122212
18  2211112111121
19  2211111122112
20  2111212111111
21  2112222121221
22  2221121222121
23  1222121121222
24  2211122111112
25  2222211221222
```

4.3.4   Solution Output

```
 1  1111222212112
 2  1111122111121
 3  1211122121211
 4  2222121122212
 5  2211112111121
 6  2212111122112
 7  2111212111111
 8  2112222121221
 9  2221121222121
10  1222121121222
11  2211122111112
12  2222211221222
13  --------------------
14  1111222211112
```

```
15  1111122111111
16  1211122121211
17  2222121122212
18  2211112111121
19  2211111122112
20  2111212111111
21  2112222121221
22  2221121222121
23  1222121121222
24  2211122111112
25  2222211221222
```

4.3.5 stderr

4.4 part02test04

4.4.1 Diff

4.4.2 Input File

```
15,13,11,9,8,7,6,5,3,2,1
```

```
1,2,2,1,3,1
2,2,2,2,1,3
1,3,3,3,3,2
3,1,1,3,3,2
3,1,2,1,1,1
2,3,3,3,3,2
3,3,3,3,2,2
```

4.4.3 Submission Output

```
 1  122131
 2  222213
 3  133332
 4  311332
 5  312111
 6  233332
 7  333322
 8  --------------------
 9  111131
10  111111
11  111111
12  111111
13  111111
14  111112
15  111122
```

4.4.4 Solution Output

```
 1  122131
 2  222213
 3  133332
 4  311332
 5  312111
 6  233332
 7  333322
 8  --------------------
 9  111131
10  111111
11  111111
12  111111
13  111111
14  111112
15  111122
```

4.4.5 stderr

4.5 part02test05

4.5.1 Diff

4.5.2 Input File

```
21,20,18,15,11,10,6,4,3,1
```

```
2,1,2,2,1,2,2,1,1,2,1,2
2,1,1,1,2,1,2,1,1,1,2,1
1,1,1,2,1,1,1,1,2,2,2,2
2,1,1,1,1,1,2,1,1,2,1,1
2,1,1,1,1,1,1,1,1,1,1,1
2,2,1,1,2,2,1,1,1,2,1,2
1,2,2,2,1,2,1,1,2,1,2,2
```

4.5.3 Submission Output

```
 1  212212211212
 2  211121211121
 3  111211112222
 4  211111211211
 5  211111111111
 6  221122111212
 7  122212112122
 8  --------------------
 9  111112211112
10  111121211111
11  111211111111
12  211111211111
13  211111111111
14  221111111212
15  122211111122
```

4.5.4 Solution Output

```
 1  212212211212
 2  211121211121
 3  111211112222
 4  211111211211
 5  211111111111
 6  221122111212
 7  122212112122
 8  --------------------
 9  111112211112
10  111121211111
11  111211111111
12  211111211111
13  211111111111
14  221111111212
15  122211111122
```

4.5.5 stderr

4.6 part02test06

4.6.1 Diff

4.6.2 Input File

```
10,9,8,7,6,4
```

```
1,1,2,2,2,2,2
2,1,2,1,1,2,1
2,1,2,2,2,2,2
2,2,2,2,2,2,2
2,2,2,2,1,2,2
1,2,1,2,2,2,2
1,1,2,2,1,1,1
2,1,2,2,1,1,2
```

4.6.3 Submission Output

```
 1  1122222
 2  2121121
 3  2122222
 4  2222222
 5  2222122
 6  1212222
 7  1122111
 8  2122112
 9  --------------------
10  1122222
11  2121121
```

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```
12  2122222
13  2222222
14  2222122
15  1212222
16  1122111
17  1122111
```

4.6.4   Solution Output

```
 1  1122222
 2  2121121
 3  2122222
 4  2222222
 5  2222122
 6  1212222
 7  1122111
 8  2122112
 9  --------------------
10  1122222
11  2121121
12  2122222
13  2222222
14  2222122
15  1212222
16  1122111
17  1122111
```

4.6.5   stderr

4.7   part02test07

4.7.1   Diff

4.7.2   Input File

```
15,8,3,1
```

```
2,1,2,1,1,2,2,2,2
2,1,1,1,2,2,2,2,1
2,1,2,2,2,1,1,2,1
1,2,2,2,1,1,1,2,1
2,2,2,1,1,1,1,2,2
2,2,2,2,2,2,2,2,2
2,1,2,2,1,2,1,2,1
1,2,1,1,1,2,1,1,1
2,2,2,1,2,1,2,1,2
2,2,1,1,2,1,1,1,1
```

4.7.3   Submission Output

```
 1  212112222
 2  211122221
 3  212221121
 4  122211121
 5  222111122
 6  222222222
 7  212212121
 8  121112111
 9  222121212
10  221121111
11  --------------------
12  111112222
13  111122221
14  112221121
15  122211121
16  222111122
17  222222222
18  212212121
19  121112111
20  222121211
21  221121111
```

4.7.4 Solution Output

```
 1  212112222
 2  211122221
 3  212221121
 4  122211121
 5  222111122
 6  222222222
 7  212212121
 8  121112111
 9  222121212
10  221121111
11  --------------------
12  111112222
13  111122221
14  112221121
15  122211121
16  222111122
17  222222222
18  212212121
19  121112111
20  222121211
21  221121111
```

4.7.5 stderr

4.8 part02test08

4.8.1 Diff

4.8.2 Input File

```
41,37,36,32,29,26,24,23,19,17,10,6,5,4
```

```
3,3,3,2,4,1,1,3
3,3,1,3,3,4,4,2
1,3,3,3,3,4,4,2
1,1,4,3,4,4,2,2
3,2,1,2,2,4,3,4
4,2,3,2,4,2,4,1
2,2,2,1,2,3,1,3
4,1,3,2,4,1,2,3
1,1,4,2,2,3,2,3
3,4,2,4,1,4,4,3
```

4.8.3 Submission Output

```
 1  33324113
 2  33133442
 3  13333442
 4  11434422
 5  32122434
 6  42324241
 7  22212313
 8  41324123
 9  11422323
10  34241443
11  --------------------
12  33324111
13  33133442
14  13333442
15  11134422
16  32122434
17  12321241
18  22211313
19  41321123
20  11422123
21  14241443
```

4.8.4 Solution Output

```
 1  33324113
 2  33133442
 3  13333442
 4  11434422
 5  32122434
 6  42324241
 7  22212313
 8  41324123
 9  11422323
10  34241443
11  --------------------
12  33324111
13  33133442
14  13333442
15  11134422
16  32122434
```

```
17  12321241
18  22211313
19  41321123
20  11422123
21  14241443
```

4.8.5 stderr

4.9 part02test09

4.9.1 Diff

4.9.2 Input File

```
38,36,32,30,27,25,23,13,11,9,8,7,4,3,2
```

```
4,2,1,1,3,4,4,1,3,4,4,3,1
2,1,1,1,3,3,3,1,3,2,2,1,3
4,2,3,4,4,1,1,1,1,2,1,2,3
4,1,1,3,4,1,3,1,1,4,1,4,1
1,2,1,1,3,4,1,3,1,2,3,3,3
1,3,4,4,1,2,1,4,1,3,3,3,2
```

4.9.3 Submission Output

```
 1  4211344134431
 2  2111333132213
 3  4234411112123
 4  4113413114141
 5  1211341312333
 6  1344121413332
 7  --------------------
 8  4111144111111
 9  1111111112213
10  4234411112123
11  4113413111141
12  1111311311333
13  1311111413332
```

4.9.4 Solution Output

```
 1  4211344134431
 2  2111333132213
 3  4234411112123
 4  4113413114141
 5  1211341312333
 6  1344121413332
 7  --------------------
 8  4111144111111
 9  1111111112213
10  4234411112123
```

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```
11  4113413111141
12  1111311311333
13  1311111413332
```

4.9.5 stderr

4.10 part02test10

4.10.1 Diff

4.10.2 Input File

```
81,74,72,68,65,64,63,62,59,54,52,49,47,46,45,43,38,35,31,29,26,23,17,15,12,9,8,7,2
```

```
2,3,3,3,1,1,3,2,1,1,1,1
1,1,2,3,1,3,1,2,2,3,1,3
1,3,1,3,1,2,3,3,2,3,3,3
3,3,1,3,2,1,1,3,3,1,2,2
3,2,3,1,1,3,3,2,2,1,1,3
3,1,3,2,3,2,1,2,3,1,1,1
3,1,2,3,2,3,2,1,3,1,3,1
1,3,1,2,2,2,2,3,3,2,1,1
3,3,2,2,3,2,2,2,2,3,3,2
1,2,1,2,3,2,1,1,3,1,2,3
2,1,2,1,1,1,2,2,2,3,2,2
1,1,3,1,2,3,1,2,1,3,2,3
2,3,2,2,3,1,2,1,3,2,2,1
1,2,3,2,1,1,2,2,3,1,1,2
2,2,2,1,2,3,1,2,1,2,2,1
```

4.10.3 Submission Output

```
 1  233311321111
 2  112313122313
 3  131312332333
 4  331321133122
 5  323113322113
 6  313232123111
 7  312323213131
 8  131222233211
 9  332232222332
10  121232113123
11  212111222322
12  113123121323
13  232231213221
14  123211223112
15  222123121221
16  ---------------------
17  211111321111
18  111111122313
19  111112112333
20  111121111122
```

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```
21  123111122113
22  113231121111
23  112321211131
24  131222211211
25  332232222112
26  111232111121
27  212111222322
28  111123121321
29  132211211221
30  123211221112
31  222121121221
```

4.10.4 Solution Output

```
 1  233311321111
 2  112313122313
 3  131312332333
 4  331321133122
 5  323113322113
 6  313232123111
 7  312323213131
 8  131222233211
 9  332232222332
10  121232113123
11  212111222322
12  113123121323
13  232231213221
14  123211223112
15  222123121221
16  --------------------
17  211111321111
18  111111122313
19  111112112333
20  111121111122
21  123111122113
22  113231121111
23  112321211131
24  131222211211
25  332232222112
26  111232111121
27  212111222322
28  111123121321
29  132211211221
30  123211221112
31  222121121221
```

4.10.5 stderr

4.11 part02test11

4.11.1 Diff

4.11.2 Input File

41,40,38,37,36,35,34,32,31,28,27,26,24,23,21,20,19,18,16,15,14,12,11,10,7,6,5,4,2,1

```
3,2,3,1,2,4,3
3,2,3,1,1,2,4
4,4,4,1,2,2,3
4,2,4,4,2,2,1
2,1,1,3,1,2,3
1,3,1,3,1,2,4
4,1,3,3,1,4,1
1,2,4,4,3,1,2
4,3,2,3,4,4,2
4,4,1,4,1,1,1
1,1,2,4,4,4,1
```

4.11.3 Submission Output

```
 1  3231243
 2  3231124
 3  4441223
 4  4244221
 5  2113123
 6  1313124
 7  4133141
 8  1244312
 9  4323442
10  4414111
11  1124441
12  --------------------
13  1131111
14  1131124
15  1111221
16  1111221
17  1111123
18  1111121
19  1111111
20  1111111
21  1111111
22  1111111
23  1111111
```

4.11.4 Solution Output

```
 1  3231243
 2  3231124
 3  4441223
 4  4244221
 5  2113123
 6  1313124
 7  4133141
 8  1244312
 9  4323442
10  4414111
11  1124441
12  --------------------
13  1131111
```

```
14  1131124
15  1111221
16  1111221
17  1111123
18  1111121
19  1111111
20  1111111
21  1111111
22  1111111
23  1111111
```

4.11.5 stderr

4.12 part02test12

4.12.1 Diff

4.12.2 Input File

```
19 ,18 ,15 ,14 ,13 ,12 ,11 ,10 ,9 ,8 ,6 ,4
```

```
2,2,2,1,1,3
4,2,2,4,3,4
2,4,3,4,2,4
2,3,3,3,3,3
1,2,2,3,2,4
4,3,2,3,1,2
```

4.12.3 Submission Output

```
 1  222113
 2  422434
 3  243424
 4  233333
 5  122324
 6  432312
 7  --------------------
 8  222113
 9  122414
10  111414
11  111111
12  111111
13  431111
```

4.12.4 Solution Output

```
 1  222113
 2  422434
 3  243424
 4  233333
 5  122324
```

```
 6  432312
 7  --------------------
 8  222113
 9  122414
10  111414
11  111111
12  111111
13  431111
```

4.12.5 stderr

4.13   part02test13

4.13.1   Diff

4.13.2   Input File

```
90,89,87,86,81,80,79,78,77,75,74,73,72,69,65,64,63,62,60,58,57,56,54,52,51,50,48,47,46,45,43
```

```
2,4,2,3,4,2,3,4,3,4,4,3,3,2,2
3,2,4,2,4,3,2,1,2,2,4,4,4,1,3
3,1,3,3,2,1,2,4,4,2,3,4,3,4,2
2,1,2,4,1,3,2,3,4,4,3,1,1,1,3
2,1,2,2,2,3,4,3,3,4,2,3,3,3,3
4,4,1,2,4,1,3,3,3,2,3,3,2,1,3
3,4,2,2,2,2,2,3,4,4,1,1,2,1,3
1,3,4,3,3,1,4,1,2,1,1,3,3,1,1
4,2,4,4,2,4,1,4,2,4,2,3,4,1,4
3,2,1,1,3,4,3,4,2,3,1,4,3,3,3
4,2,4,4,3,2,4,1,1,2,4,4,4,1,3
1,4,4,3,2,2,4,2,1,3,2,2,1,4,2
```

4.13.3   Submission Output

```
 1  242342343443322
 2  324243212244413
 3  313321244234342
 4  212413234431113
 5  212223433423333
 6  441241333233213
 7  342222234411213
 8  134331412113311
 9  424424142423414
10  321134342314333
11  424432411244413
12  144322421322142
13  --------------------
14  112341343441122
15  324141212244413
16  311111211234142
17  112413231131111
```

```
18   112223133111111
19   441241333111111
20   342222231111111
21   111331111111111
22   111111111421114
23   311111111111111
24   111111411211111
25   111111421111142
```

4.13.4   Solution Output

```
 1   242342343443322
 2   324243212244413
 3   313321244234342
 4   212413234431113
 5   212223433423333
 6   441241333233213
 7   342222234411213
 8   134331412113311
 9   424424142423414
10   321134342314333
11   424432411244413
12   144322421322142
13   --------------------
14   112341343441122
15   324141212244413
16   311111211234142
17   112413231131111
18   112223133111111
19   441241333111111
20   342222231111111
21   111331111111111
22   111111111421114
23   311111111111111
24   111111411211111
25   111111421111142
```

4.13.5   stderr

4.14   part02test14

4.14.1   Diff

4.14.2   Input File

```
74,73,72,71,70,69,68,67,66,65,64,63,62,61,60,59,58,56,55,54,53,52,51,50,49,48,47,46,45,44,43
```

```
3,1,2,1,3,1,2,3,1,3,3,3
3,1,2,3,2,2,2,2,1,3,3,2
2,2,1,2,2,2,2,1,1,1,1,2
1,1,2,1,1,2,3,1,2,3,3,2
```

```
1,3,2,2,1,3,3,1,1,3,2,3
2,1,2,1,2,1,3,2,2,2,1,3
2,3,1,3,1,1,2,3,3,3,3,2
1,3,1,2,2,2,2,1,2,1,3,2
1,3,2,1,2,1,2,1,3,3,1,1
2,1,3,3,2,3,1,2,1,3,1,2
2,3,2,2,3,1,3,2,3,3,2,2
1,3,3,2,3,3,1,2,2,1,1,2
1,1,3,3,1,1,2,1,1,3,3,1
2,2,3,1,1,2,2,2,1,2,1,2
2,3,2,2,1,2,2,3,2,2,3,2
```

4.14.3 Submission Output

```
1   312131231333
2   312322221332
3   221222211112
4   112112312332
5   132213311323
6   212121322213
7   231311233332
8   131222212132
9   132121213311
10  213323121312
11  232231323322
12  133233122112
13  113311211331
14  223112221212
15  232212232232
16  --------------------
17  111111111111
18  111111111111
19  111111111111
20  111111111111
21  111111111111
22  111111111111
23  111111111111
24  111111111111
25  111111111111
26  111111111111
27  111111111111
28  111111111111
29  111111111111
30  111111111111
31  111111111111
```

4.14.4 Solution Output

```
1   312131231333
2   312322221332
3   221222211112
4   112112312332
5   132213311323
6   212121322213
7   231311233332
8   131222212132
9   132121213311
10  213323121312
```

```
11  232231323322
12  133233122112
13  113311211331
14  223112221212
15  232212232232
16  --------------------
17  111111111111
18  111111111111
19  111111111111
20  111111111111
21  111111111111
22  111111111111
23  111111111111
24  111111111111
25  111111111111
26  111111111111
27  111111111111
28  111111111111
29  111111111111
30  111111111111
31  111111111111
```

4.14.5 stderr

4.15   part02test15

4.15.1   Diff

4.15.2   Input File

```
19,18,13,12,11,4,2
```

```
1,2,1,1,1,2,1,1,2
1,2,1,2,2,2,1,1,2
1,2,2,1,2,1,2,2,2
1,1,2,1,1,2,2,1,1
2,2,1,2,2,1,1,1,2
1,2,1,2,1,1,1,1,2
2,1,2,1,2,2,1,2,2
1,1,2,1,2,1,2,2,1
2,2,2,1,2,1,2,1,1
1,2,1,1,2,1,1,2,1
2,2,2,1,2,2,2,2,2
2,2,2,2,1,2,1,1,1
2,1,2,1,1,2,2,2,2
2,2,1,1,1,1,2,2,1
```

4.15.3   Submission Output

```
1  121112112
2  121222112
3  122121222
```

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```
 4   112112211
 5   221221112
 6   121211112
 7   212122122
 8   112121221
 9   222121211
10   121121121
11   222122222
12   222212111
13   212112222
14   221111221
15   --------------------
16   111111112
17   111111112
18   111111222
19   111112211
20   221111111
21   121111111
22   112111111
23   112111111
24   222111111
25   121111111
26   222111111
27   222211111
28   212111111
29   221111111
```

4.15.4   Solution Output

part02test15.solution

```
 1   121112112
 2   121222112
 3   122121222
 4   112112211
 5   221221112
 6   121211112
 7   212122122
 8   112121221
 9   222121211
10   121121121
11   222122222
12   222212111
13   212112222
14   221111221
15   --------------------
16   111111112
17   111111112
18   111111222
19   111112211
20   221111111
21   121111111
22   112111111
23   112111111
24   222111111
25   121111111
26   222111111
27   222211111
28   212111111
29   221111111
```

4.15.5 stderr

4.16 part02test16

4.16.1 Diff

4.16.2 Input File

part02test16.moves.bff

```
33 ,32 ,30 ,29 ,27 ,26 ,25 ,23 ,21 ,19 ,18 ,13 ,12 ,11 ,10 ,7 ,6 ,4 ,3 ,2 ,1
```

part02test16.game.bff

```
3,4,2,1,3,4,2
4,3,4,1,3,3,2
2,2,3,1,4,3,4
1,3,3,3,1,4,1
1,3,4,3,2,3,1
3,4,4,1,1,4,1
1,2,2,3,1,3,1
4,1,3,2,2,3,4
```

4.16.3 Submission Output

part02test16.output

```
 1  3421342
 2  4341332
 3  2231434
 4  1333141
 5  1343231
 6  3441141
 7  1223131
 8  4132234
 9  --------------------
10  1111311
11  4311331
12  1111134
13  1111141
14  1111211
15  3111111
16  1111111
17  1131111
```

4.16.4 Solution Output

part02test16.solution

```
 1  3421342
 2  4341332
 3  2231434
 4  1333141
 5  1343231
 6  3441141
 7  1223131
 8  4132234
 9  --------------------
```

```
10  1111311
11  4311331
12  1111134
13  1111141
14  1111211
15  3111111
16  1111111
17  1131111
```

4.16.5 stderr

4.17 part02test17

4.17.1 Diff

4.17.2 Input File

```
77,76,73,64,63,57,56,52,51,49,47,45,44,39,34,26,24,22,21,19,13,8,1
```

```
2,3,3,2,4,1,2,2,1,1,4,3,1
3,2,4,2,4,2,2,3,1,1,1,4,2
3,1,3,3,4,2,3,3,3,4,1,3,1
3,3,2,4,1,3,4,2,2,1,1,3,2
4,3,4,4,3,3,2,2,1,4,3,1,2
2,4,1,4,1,1,2,4,1,4,3,2,2
1,4,2,2,1,2,4,4,2,3,3,4,2
1,1,3,4,1,1,3,2,2,4,1,3,4
4,3,3,3,2,3,2,4,3,2,2,3,2
3,1,3,2,4,4,3,1,4,4,2,2,3
2,1,3,3,1,1,3,3,4,1,3,4,2
1,2,2,1,3,1,4,3,4,3,4,4,1
1,4,2,1,3,3,3,4,1,3,3,1,1
4,1,2,3,4,3,4,3,1,2,1,1,4
```

4.17.3 Submission Output

```
 1  2332412211431
 2  3242422311142
 3  3133423334131
 4  3324134221132
 5  4344332214312
 6  2414112414322
 7  1422124423342
 8  1134113224134
 9  4333232432232
10  3132443144223
11  2133113341342
12  1221314343441
13  1421333413311
14  4123434312114
15  --------------------
16  1332412211131
```

```
17  3212422311142
18  3133423331131
19  3314131221132
20  4344332214312
21  1414112414322
22  1411124423342
23  1111113221114
24  1111132411112
25  3112441144113
26  2111111141342
27  1221111143441
28  1421111413311
29  4123414312114
```

4.17.4 Solution Output

```
 1  2332412211431
 2  3242422311142
 3  3133423334131
 4  3324134221132
 5  4344332214312
 6  2414112414322
 7  1422124423342
 8  1134113224134
 9  4333232432232
10  3132443144223
11  2133113341342
12  1221314343441
13  1421333413311
14  4123434312114
15  --------------------
16  1332412211131
17  3212422311142
18  3133423331131
19  3314131221132
20  4344332214312
21  1414112414322
22  1411124423342
23  1111113221114
24  1111132411112
25  3112441144113
26  2111111141342
27  1221111143441
28  1421111413311
29  4123414312114
```

4.17.5 stderr

4.18 part02test18

4.18.1 Diff

4.18.2 Input File

```
36,34,32,31,29,27,26,20,17,12,9,8,7,4,3
```

```
4,3,1,4,4,3
1,3,1,1,2,1
2,3,3,4,4,1
1,4,4,1,2,3
2,3,2,4,4,2
2,3,2,3,1,1
4,1,3,4,4,2
4,3,2,2,4,4
1,1,2,2,4,1
2,4,4,2,1,4
2,4,4,2,1,2
4,4,3,3,3,1
```

4.18.3 Submission Output

```
 1  431443
 2  131121
 3  233441
 4  144123
 5  232442
 6  232311
 7  413442
 8  432244
 9  112241
10  244214
11  244212
12  443331
13  --------------------
14  431113
15  131111
16  133441
17  111123
18  212441
19  212311
20  413111
21  431111
22  111111
23  144114
24  144111
25  443331
```

4.18.4 Solution Output

```
 1  431443
 2  131121
 3  233441
 4  144123
 5  232442
 6  232311
 7  413442
 8  432244
 9  112241
10  244214
```

```
11  244212
12  443331
13  --------------------
14  431113
15  131111
16  133441
17  111123
18  212441
19  212311
20  413111
21  431111
22  111111
23  144114
24  144111
25  443331
```

4.18.5 stderr

4.19 part02test19

4.19.1 Diff

4.19.2 Input File

```
20
```

```
1,2,2,2,2,2,1,2,1
1,2,2,2,1,1,2,2,2
1,1,1,2,2,2,1,2,2
1,1,1,1,2,2,1,2,1
1,2,1,2,2,2,2,2,2
2,1,1,1,2,1,2,1,2
1,1,2,2,2,1,2,2,1
1,2,1,1,1,2,1,1,2
1,2,1,1,1,1,1,2,1
2,2,1,2,2,1,1,2,2
2,2,1,2,2,1,1,2,1
1,1,2,1,1,1,2,1,2
```

4.19.3 Submission Output

```
 1  122222121
 2  122211222
 3  111222122
 4  111122121
 5  121222222
 6  211121212
 7  112221221
 8  121112112
 9  121111121
10  221221122
11  221221121
```

```
12  112111212
13  --------------------
14  122222121
15  122211222
16  111222122
17  111122121
18  121222222
19  211121212
20  112221221
21  121112112
22  121111121
23  221221122
24  221221121
25  112111212
```

4.19.4 Solution Output

```
 1  122222121
 2  122211222
 3  111222122
 4  111122121
 5  121222222
 6  211121212
 7  112221221
 8  121112112
 9  121111121
10  221221122
11  221221121
12  112111212
13  --------------------
14  122222121
15  122211222
16  111222122
17  111122121
18  121222222
19  211121212
20  112221221
21  121112112
22  121111121
23  221221122
24  221221121
25  112111212
```

4.19.5 `stderr`

4.20 part02test20

4.20.1 Diff

4.20.2 Input File

```
54,53,52,51,50,49,48,46,45,44,43,41,38,37,35,34,33,32,31,30,29,28,27,24,23,21,20,19,16,15,14
```

```
2,1,3,2,3,3,1,2,3,3,2
3,1,2,1,1,2,2,3,1,2,2
3,1,2,2,3,1,2,1,3,3,3
2,1,2,2,3,1,1,3,1,2,2
3,2,2,2,2,3,2,3,1,3,3
3,2,3,3,1,3,1,2,3,1,1
3,2,3,2,2,3,2,3,2,1,1
1,1,3,3,3,3,3,1,1,2,1
3,1,3,2,2,3,1,3,3,1,2
1,1,3,3,1,2,3,1,2,2,3
1,2,2,2,2,1,3,3,1,2,1
```

4.20.3   Submission Output

```
 1  21323312332
 2  31211223122
 3  31223121333
 4  21223113122
 5  32222323133
 6  32331312311
 7  32322323211
 8  11333331121
 9  31322313312
10  11331231223
11  12222133121
12  --------------------
13  21313311112
14  31111111122
15  31111111111
16  11111111111
17  11111111111
18  11111111111
19  11111111111
20  11111111111
21  11111111111
22  11111111111
23  11111111111
```

4.20.4   Solution Output

```
 1  21323312332
 2  31211223122
 3  31223121333
 4  21223113122
 5  32222323133
 6  32331312311
 7  32322323211
 8  11333331121
 9  31322313312
10  11331231223
11  12222133121
12  --------------------
13  21313311112
14  31111111122
15  31111111111
16  11111111111
17  11111111111
```

```
18   11111111111
19   11111111111
20   11111111111
21   11111111111
22   11111111111
23   11111111111
```

4.20.5   stderr

4.21   Source Code

csce322h0mework02part02.js

```js
 1   module.exports = {
 2       onePlayerManyMoves: onePlayerManyMoves
 3   }
 4
 5   var helpers = require( './helpers' );
 6
 7   function onePlayerManyMoves( game ){
 8
 9       function whatever( moves ){
10                   for(var i = 0; i < moves.length; i++){
11                   var clusters = [];
12                   var clusterCounter = 1;
13                   var numberOfMatches = 0;
14                   var lengthOfRow = game.length;
15                   var lengthOfColumn = game[0].length;
16                   var copy = [];
17
18                   // Initialize first row
19                   clusters[0] = [];
20                   clusters[0][0] = 1;
21                   copy[0] = [];
22                   copy[0][0] = 1;
23
24                   for(var row = 1; row < lengthOfColumn; row++ ){
25                           if(game[0][row] == game[0][row-1]){
26                                   clusters[0][row] = clusterCounter;
27                                   copy[0][row] = clusterCounter;
28                           }
29
30                           else{
31                                   clusterCounter++;
32                                   clusters[0][row] = clusterCounter;
33                                   copy[0][row] = clusterCounter;
34                           }
35                   }
36
37                   // Take care of every other row
38                   for(var r = 1; r < lengthOfRow; r++){
39                           clusters[r] = [];
40                           copy[r] = [];
41
42                           for(var c = 0; c < lengthOfColumn; c++){
43
44                                   if(c == 0){
45                                           clusterCounter++;
```

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```
46                                              clusters[r][c] = clusterCounter;
47                                              copy[r][c] = clusterCounter;
48                                          }
49                                      else if(game[r][c] == game[r][c-1]){
50                                              clusters[r][c] = clusterCounter;
51                                              copy[r][c] = clusterCounter;
52                                      }
53
54                                      else{
55                                              clusterCounter++;
56                                              clusters[r][c] = clusterCounter;
57                                              copy[r][c] = clusterCounter;
58                                      }
59                              }
60                      }
61
62              // Combine clusters with the same value
63              for(var ro = 1; ro < lengthOfRow; ro++){
64                      for(var co = 0; co < lengthOfColumn; co++){
65                              if(game[ro][co] == game[ro-1][co]){
66                                      var valueToMatch = clusters[ro][co];
67                                      var valueToTurn = clusters[ro-1][co];
68
69                                      for(var newRo = 0; newRo < lengthOfRow; newRo
    ++){
70                                              for(var newCo = 0; newCo <
    lengthOfColumn; newCo++){
71                                                      if(clusters[newRo][newCo] ==
    valueToMatch){
72                                                              clusters[newRo][newCo]
     = valueToTurn;
73                                                      }
74                                              }
75                                      }
76
77                              }
78                      }
79              }
80
81              var newClusterCounter = 1;
82
83              // Reduce cluster values
84              for(var row = 0; row < lengthOfRow; row++){
85                      for(var col = 0; col < lengthOfColumn; col++){
86                              if(copy[row][col] != null){
87                                      var searchValue = clusters[row][col];
88                                      copy[row][col] = null;
89
90                                      for(var r = 0; r < lengthOfRow; r++){
91                                              for(var c = 0; c < lengthOfColumn; c
    ++){
92                                                      if(clusters[r][c] ==
    searchValue){
93                                                              clusters[r][c] =
    newClusterCounter;
94                                                              copy[r][c] = null;
95                                                      }
96                                              }
97                                      }
98
```

```
 99                                                  newClusterCounter++;
100                                        }
101                                }
102                        }
103
104                // Find the move to make and change the cluster
105                for(var row = 0; row < lengthOfRow; row++){
106                        for(var col = 0; col < lengthOfColumn; col++){
107
108                                if(clusters[row][col] == moves[i]){
109                                        game[row][col] = 1;
110                                }
111                        }
112                }
113                }
114                return game;
115        }
116
117        return whatever;
118  }
```

Chapter 5

csce322h0mework02part03.js

5.1   part03test01

5.1.1   Diff

5.1.2   Input File

```
40,38,36,33,31,27,25,22,16,12,11,8,5,3
```

```
3,2,1,1,3,3,2,3,2
1,2,3,3,1,2,2,3,3
1,2,1,3,2,2,1,1,1
2,2,3,2,3,1,3,1,3
1,2,2,1,3,1,2,3,3
2,1,1,2,2,3,2,2,1
1,2,3,3,1,2,3,3,1
2,1,2,2,2,3,3,3,3
3,1,2,1,1,1,3,2,1
1,2,3,1,2,1,3,3,2
```

5.1.3   Submission Output

```
 1  321133232
 2  123312233
 3  121322111
 4  223231313
 5  122131233
 6  211223221
 7  123312331
 8  212223333
 9  312111321
10  123121332
11  ------------------
12  321133232
13  123312233
14  121322111
15  223231313
16  122131233
17  211223221
18  123312331
```

```
19  212223333
20  312111321
21  123121332
```

5.1.4 Solution Output

```
 1  321133232
 2  123312233
 3  121322111
 4  223231313
 5  122131233
 6  211223221
 7  123312331
 8  212223333
 9  312111321
10  123121332
11  ------------------
12  321133232
13  123312233
14  121322111
15  223231313
16  122131233
17  211223221
18  123312331
19  212223333
20  312111321
21  123121332
```

5.1.5 stderr

5.2 part03test02

5.2.1 Diff

5.2.2 Input File

```
23 ,20 ,19 ,16 ,15 ,10 ,6 ,5 ,4 ,3 ,2 ,1
```

```
2,3,4,1,1,2,1
1,2,2,4,4,2,2
1,3,3,2,2,2,2
2,3,4,4,1,2,3
1,1,3,1,2,1,2
2,2,2,3,1,1,2
1,2,2,4,1,2,2
```

5.2.3 Submission Output

```
 1  2341121
 2  1224422
 3  1332222
```

```
 4  2344123
 5  1131212
 6  2223112
 7  1224122
 8  -----------------
 9  2341121
10  1224422
11  1332222
12  2344123
13  1131212
14  2223112
15  1224122
```

5.2.4 Solution Output

```
 1  2341121
 2  1224422
 3  1332222
 4  2344123
 5  1131212
 6  2223112
 7  1224122
 8  -----------------
 9  2341121
10  1224422
11  1332222
12  2344123
13  1131212
14  2223112
15  1224122
```

5.2.5 `stderr`

5.3 part03test03

5.3.1 Diff

5.3.2 Input File

42,41,40,39,38,37,36,34,33,32,31,29,28,27,25,24,23,22,20,19,18,17,16,15,14,12,11,10,9,8,7,6,

```
2,1,1,2,1,2,2,2,1,1,2,2,2
1,2,2,1,2,1,1,2,2,1,2,2,2
1,1,2,1,1,1,2,1,1,2,2,2,1
1,1,1,1,2,2,2,2,1,2,1,2,1
1,2,2,1,2,1,1,1,2,1,2,1,2
2,2,2,2,2,2,1,2,1,2,1,1,2
1,1,1,2,1,2,2,1,1,1,2,2,1
2,2,2,1,2,1,2,1,1,1,2,1,2
2,2,2,2,2,1,1,2,2,1,1,1,2
1,1,2,1,2,2,1,2,2,1,1,2,2
```

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```
2,2,2,2,2,2,1,2,2,1,1,2,2
2,1,1,1,2,1,1,2,1,1,2,1,1
1,1,1,1,1,2,1,1,1,2,1,2,1
1,2,1,1,1,1,2,2,2,2,1,1,2
```

5.3.3   Submission Output

part03test03.output

```
 1  2112122211222
 2  1221211221222
 3  1121112112221
 4  1111222212121
 5  1221211121212
 6  2222221212112
 7  1112122111221
 8  2221212111212
 9  2222211221112
10  1121221221122
11  2222221221122
12  2111211211211
13  1111121112121
14  1211112222112
15  -----------------
16  2112122211222
17  1221211221222
18  1121112112221
19  1111222212121
20  1221211121212
21  2222221212112
22  1112122111221
23  2221212111212
24  2222211221112
25  1121221221122
26  2222221221122
27  2111211211211
28  1111121112121
29  1211112222111
```

5.3.4   Solution Output

part03test03.solution

```
 1  2112122211222
 2  1221211221222
 3  1121112112221
 4  1111222212121
 5  1221211121212
 6  2222221212112
 7  1112122111221
 8  2221212111212
 9  2222211221112
10  1121221221122
11  2222221221122
12  2111211211211
13  1111121112121
14  1211112222112
15  -----------------
16  2112122211222
17  1221211221222
18  1121112112221
19  1111222212121
```

```
20  1221211121212
21  2222221212112
22  1112122111221
23  2221212111212
24  2222211221112
25  1121221221122
26  2222221221122
27  2111211211211
28  1111121112121
29  1211112222111
```

5.3.5 stderr

5.4 part03test04

5.4.1 Diff

5.4.2 Input File

```
58 ,46 ,43 ,37 ,33 ,32 ,20 ,14
```

```
4,4,3,1,1,1,3,1,4,1
3,2,1,1,4,1,1,3,1,4
4,2,2,2,4,4,4,1,3,3
2,1,2,3,4,4,3,2,3,3
4,3,4,2,4,4,2,1,2,4
2,3,3,1,4,1,4,4,2,1
3,1,3,2,1,4,3,2,3,2
4,3,2,2,4,1,1,1,4,3
4,1,1,3,2,1,3,1,1,2
3,2,1,3,3,2,3,2,2,1
3,3,4,2,4,4,3,2,4,3
2,1,2,1,4,2,3,2,2,1
```

5.4.3 Submission Output

```
 1  4431113141
 2  3211411314
 3  4222444133
 4  2123443233
 5  4342442124
 6  2331414421
 7  3132143232
 8  4322411143
 9  4113213112
10  3213323221
11  3342443243
12  2121423221
13  ------------------
14  4431113141
15  3211411314
16  4222444133
```

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```
17  2123443233
18  4342442124
19  2331414421
20  3132143232
21  4322411143
22  4113213112
23  3213323111
24  3342443143
25  2121423111
```

5.4.4   Solution Output

```
 1  4431113141
 2  3211411314
 3  4222444133
 4  2123443233
 5  4342442124
 6  2331414421
 7  3132143232
 8  4322411143
 9  4113213112
10  3213323221
11  3342443243
12  2121423221
13  ------------------
14  4431113141
15  3211411314
16  4222444133
17  2123443233
18  4342442124
19  2331414421
20  3132143232
21  4322411143
22  4113213112
23  3213323111
24  3342443143
25  2121423111
```

5.4.5   stderr

5.5   part03test05

5.5.1   Diff

5.5.2   Input File

```
15,14,9,6
```

```
1,2,2,1,2,2,1,1
2,2,2,2,2,2,2,2
2,2,2,1,1,2,2,1
1,1,2,1,2,1,1,2
```

```
1,1,1,1,1,2,2,2
1,2,1,1,2,1,1,1
1,2,2,1,2,1,2,1
2,2,2,2,1,2,1,1
2,2,1,2,1,1,2,2
2,2,1,1,2,2,1,2
1,1,1,2,2,1,2,2
1,2,1,2,1,1,2,2
1,1,1,2,1,2,1,1
```

5.5.3 Submission Output

part03test05.output

```
 1   12212211
 2   22222222
 3   22211221
 4   11212112
 5   11111222
 6   12112111
 7   12212121
 8   22221211
 9   22121122
10   22112212
11   11122122
12   12121122
13   11121211
14   -----------------
15   12212211
16   22222222
17   22211221
18   11212112
19   11111222
20   12112111
21   12212121
22   22221111
23   22121122
24   22112212
25   11122122
26   12121122
27   11121211
```

5.5.4 Solution Output

part03test05.solution

```
 1   12212211
 2   22222222
 3   22211221
 4   11212112
 5   11111222
 6   12112111
 7   12212121
 8   22221211
 9   22121122
10   22112212
11   11122122
12   12121122
13   11121211
14   -----------------
15   12212211
16   22222222
```

```
17  22211221
18  11212112
19  11111222
20  12112111
21  12212121
22  22221111
23  22121122
24  22112212
25  11122122
26  12121122
27  11121211
```

5.5.5 stderr

5.6 part03test06

5.6.1 Diff

5.6.2 Input File

```
67 ,65 ,64 ,58 ,54 ,51 ,50 ,48 ,47 ,44 ,39 ,36 ,33 ,26 ,25 ,24 ,23 ,22 ,16 ,13 ,12 ,7 ,6 ,4 ,3 ,1
```

```
2,2,2,1,1,2,1,2,3,2,1,1,2,2
1,3,1,2,3,2,3,1,2,3,1,3,2,3
1,1,1,3,2,2,1,1,3,1,1,1,2,2
3,1,3,3,2,2,3,1,1,2,3,1,1,3
3,1,1,2,3,3,2,1,1,1,1,2,3,2
1,1,3,3,1,1,3,1,3,2,1,1,3,3
3,3,3,3,3,1,3,1,2,1,1,2,2,3
2,3,3,2,3,1,3,1,3,3,2,1,2,2
1,1,3,3,3,2,2,2,1,1,1,2,2,1
2,1,1,3,1,1,1,3,3,2,1,3,1,1
3,1,1,3,1,1,2,3,1,3,1,1,1,3
3,1,3,1,2,3,2,2,1,2,2,2,3,1
3,3,2,1,3,3,1,3,1,2,1,2,2,1
```

5.6.3 Submission Output

```
 1  22211212321122
 2  13123231231323
 3  11132211311122
 4  31332231123113
 5  31123321111232
 6  11331131321133
 7  33333131211223
 8  23323131332122
 9  11333222111221
10  21131113321311
11  31131123131113
12  31312322122231
13  33213313121221
14  ------------------
```

```
15  22211212321122
16  13123231231323
17  11132211311122
18  31332231123113
19  31123321111232
20  11331131321133
21  33333131211223
22  23323131332122
23  11333222111221
24  21131113321311
25  31131123131113
26  31312322122231
27  33213311121221
```

5.6.4 Solution Output

```
 1  22211212321122
 2  13123231231323
 3  11132211311122
 4  31332231123113
 5  31123321111232
 6  11331131321133
 7  33333131211223
 8  23323131332122
 9  11333222111221
10  21131113321311
11  31131123131113
12  31312322122231
13  33213313121221
14  -----------------
15  22211212321122
16  13123231231323
17  11132211311122
18  31332231123113
19  31123321111232
20  11331131321133
21  33333131211223
22  23323131332122
23  11333222111221
24  21131113321311
25  31131123131113
26  31312322122231
27  33213311121221
```

5.6.5 stderr

5.7 part03test07

5.7.1 Diff

5.7.2 Input File

```
32,28,25,24,23,22,21,19,18,17,16,13,12,11,10,9,8,6,5,4,3,2,1
```

```
2,1,1,2,3,3,3,3,1
1,3,3,1,3,2,1,3,2
2,3,2,3,2,3,2,1,1
3,1,2,1,2,1,3,2,1
1,2,1,1,2,2,3,2,1
3,1,3,2,1,1,3,1,1
3,1,1,2,2,2,3,1,2
```

5.7.3 Submission Output

```
1   211233331
2   133132132
3   232323211
4   312121321
5   121122321
6   313211311
7   311222312
8   ------------------
9   211233331
10  133132132
11  232323211
12  312121321
13  121122321
14  313211311
15  311222311
```

5.7.4 Solution Output

```
1   211233331
2   133132132
3   232323211
4   312121321
5   121122321
6   313211311
7   311222312
8   ------------------
9   211233331
10  133132132
11  232323211
12  312121321
13  121122321
14  313211311
15  311222311
```

5.7.5 stderr

5.8 part03test08

5.8.1 Diff

5.8.2 Input File

84,82,77,76,74,70,68,67,66,62,60,55,54,52,49,48,46,44,41,40,39,38,36,31,29,23,18,16,14,13,5,

```
3,3,3,2,4,2,3,3,4,4,1,4,2,2
4,1,3,3,4,3,3,1,2,1,4,4,4,2
4,3,4,4,4,4,4,4,3,1,1,2,4,4
4,4,2,3,3,3,1,2,3,4,3,4,4,2
4,2,3,1,4,3,3,4,4,4,1,4,3,1
4,1,3,3,2,3,1,2,1,4,2,4,4,4
1,1,3,2,4,2,4,3,2,2,3,2,1,3
4,1,1,3,1,2,3,1,1,4,4,3,1,3
4,4,3,2,1,4,4,4,2,3,3,1,1,2
1,3,3,1,2,4,2,4,3,3,4,3,4,1
4,4,1,3,2,4,1,2,3,3,3,3,4,4
2,3,3,3,4,1,4,4,4,3,1,1,3,4
2,2,2,2,1,2,1,1,2,2,3,4,4,1
```

5.8.3 Submission Output

```
1   33324233441422
2   41334331214442
3   43444444311244
4   44233312343442
5   42314334441431
6   41332312142444
7   11324243223213
8   41131231144313
9   44321444233112
10  13312424334341
11  44132412333344
12  23334144431134
13  22221211223441
14  -----------------
15  33324233441422
16  41334331214442
17  43444444311244
18  44233312343442
19  42314334441431
20  41332312142444
21  11324243223213
22  41131231144313
23  44321444233112
24  13312424334341
25  44132412333344
26  23334144431134
27  22221211223111
```

5.8.4 Solution Output

```
1   33324233441422
2   41334331214442
3   43444444311244
4   44233312343442
5   42314334441431
6   41332312142444
```

```
 7  11324243223213
 8  41131231144313
 9  44321444233112
10  13312424334341
11  44132412333344
12  23334144431134
13  22221211223441
14  ------------------
15  33324233441422
16  41334331214442
17  43444444311244
18  44233312343442
19  42314334441431
20  41332312142444
21  11324243223213
22  41131231144313
23  44321444233112
24  13312424334341
25  44132412333344
26  23334144431134
27  22221211223111
```

5.8.5 stderr

part03test08.err

5.9 part03test09

5.9.1 Diff

part03test09.diff

5.9.2 Input File

part03test09.moves.bff

```
38,37,36,31,27,21,10,6
```

part03test09.game.bff

```
3,2,2,2,3,2,2
3,3,2,3,2,2,3
3,3,3,2,2,1,2
3,3,2,3,2,1,2
1,2,1,3,3,3,2
3,3,1,3,2,1,2
3,2,2,2,1,2,2
2,1,1,1,1,1,2
1,3,2,3,3,2,2
2,1,2,2,2,2,2
3,1,2,1,1,3,2
1,2,3,2,2,3,2
3,3,2,1,3,1,1
2,2,3,3,2,1,3
```

5.9.3 Submission Output

part03test09.output

```
1  3222322
2  3323223
3  3332212
```

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```
 4  3323212
 5  1213332
 6  3313212
 7  3222122
 8  2111112
 9  1323322
10  2122222
11  3121132
12  1232232
13  3321311
14  2233213
15  -----------------
16  3222322
17  3323223
18  3332212
19  3323212
20  1213332
21  3313212
22  3222122
23  2111112
24  1323322
25  2122222
26  3121132
27  1232232
28  3321311
29  2211213
```

5.9.4   Solution Output

```
 1  3222322
 2  3323223
 3  3332212
 4  3323212
 5  1213332
 6  3313212
 7  3222122
 8  2111112
 9  1323322
10  2122222
11  3121132
12  1232232
13  3321311
14  2233213
15  -----------------
16  3222322
17  3323223
18  3332212
19  3323212
20  1213332
21  3313212
22  3222122
23  2111112
24  1323322
25  2122222
26  3121132
27  1232232
28  3321311
29  2211213
```

5.9.5 stderr

5.10 part03test10

5.10.1 Diff

5.10.2 Input File

```
36,35,34,33,32,31,30,29,28,27,26,25,24,22,21,20,19,18,15,12,11,10,9,8,7,6,4,3,2,1
```

```
2,3,3,1,2,3,2,1,1
2,1,1,3,3,1,1,1,2
3,2,2,3,3,1,1,2,1
2,2,3,3,1,2,1,2,2
2,1,3,2,2,2,1,2,1
3,1,2,3,2,1,3,3,2
1,3,3,3,2,1,1,1,2
3,2,3,1,3,3,1,2,1
2,1,3,1,1,3,2,1,1
2,2,2,3,1,3,2,1,2
```

5.10.3 Submission Output

```
 1  233123211
 2  211331112
 3  322331121
 4  223312122
 5  213222121
 6  312321332
 7  133321112
 8  323133121
 9  213113211
10  222313212
11  -----------------
12  233123211
13  211331112
14  322331121
15  223312122
16  213222121
17  312321332
18  133321112
19  323133121
20  213113211
21  222313211
```

5.10.4 Solution Output

```
 1  233123211
 2  211331112
 3  322331121
```

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```
 4  223312122
 5  213222121
 6  312321332
 7  133321112
 8  323133121
 9  213113211
10  222313212
11  ------------------
12  233123211
13  211331112
14  322331121
15  223312122
16  213222121
17  312321332
18  133321112
19  323133121
20  213113211
21  222313211
```

5.10.5 stderr

5.11 part03test11

5.11.1 Diff

5.11.2 Input File

```
54,50,49,47,41,33,28,27,25,24,21,17,14,9,4
```

```
2,1,3,2,2,2,2,2,3,1,2,3
2,3,3,2,2,3,1,3,3,1,3,2
2,1,2,1,3,1,2,3,1,1,1,3
1,3,3,1,2,1,1,1,3,3,2,3
2,1,3,1,1,2,2,3,3,3,1,2
2,2,3,3,1,1,3,2,1,1,1,2
3,2,2,2,2,2,2,3,1,1,2,2
2,1,3,1,3,3,3,2,3,2,2,1
2,3,2,2,1,1,3,2,1,3,1,2
2,3,2,3,1,1,2,1,1,2,3,2
1,2,2,3,3,3,1,2,1,3,3,1
```

5.11.3 Submission Output

```
 1  213222223123
 2  233223133132
 3  212131231113
 4  133121113323
 5  213112233312
 6  223311321112
 7  322222231122
 8  213133323221
 9  232211321312
```

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```
10  232311211232
11  122333121331
12  -----------------
13  213222223123
14  233223133132
15  212131231113
16  133121113323
17  213112233312
18  223311321112
19  322222231122
20  213133323221
21  232211321312
22  232311211232
23  122333121331
```

5.11.4   Solution Output

```
 1  213222223123
 2  233223133132
 3  212131231113
 4  133121113323
 5  213112233312
 6  223311321112
 7  322222231122
 8  213133323221
 9  232211321312
10  232311211232
11  122333121331
12  -----------------
13  213222223123
14  233223133132
15  212131231113
16  133121113323
17  213112233312
18  223311321112
19  322222231122
20  213133323221
21  232211321312
22  232311211232
23  122333121331
```

5.11.5   stderr

5.12   part03test12

5.12.1   Diff

5.12.2   Input File

```
32,30,29,28,26,25,23,21,20,14,13,12,11,9,7,6,4,2
```

```
1,1,1,1,1,1,1,2,2
```

```
1,2,2,2,2,1,1,1,1
2,1,2,2,1,1,2,1,2
1,2,2,2,1,2,1,2,2
2,1,1,2,2,1,1,1,1
1,2,1,1,1,1,2,1,2
1,2,1,2,2,2,1,2,1
1,1,1,1,1,2,1,2,2
2,2,2,2,2,2,1,1,2
1,1,2,1,2,2,2,2,1
2,2,1,1,2,2,2,1,2
2,1,2,1,2,1,1,2,1
2,2,1,1,1,1,1,1,2
2,1,2,1,2,2,2,1,2
1,2,1,2,2,2,2,1,2
```

5.12.3 Submission Output

part03test12.output

```
1   111111122
2   122221111
3   212211212
4   122212122
5   211221111
6   121111212
7   121222121
8   111112122
9   222222112
10  112122221
11  221122212
12  212121121
13  221111112
14  212122212
15  121222212
16  -----------------
17  111111122
18  122221111
19  212211212
20  122212122
21  211221111
22  121111212
23  121222121
24  111112122
25  222222112
26  112122221
27  221122212
28  212121121
29  221111112
30  212111112
31  121111112
```

5.12.4 Solution Output

part03test12.solution

```
1   111111122
2   122221111
3   212211212
4   122212122
5   211221111
6   121111212
7   121222121
```

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```
 8  111112122
 9  222222112
10  112122221
11  221122212
12  212121121
13  221111112
14  212122212
15  121222212
16  -----------------
17  111111122
18  122221111
19  212211212
20  122212122
21  211221111
22  121111212
23  121222121
24  111112122
25  222222112
26  112122221
27  221122212
28  212121121
29  221111112
30  212111112
31  121111112
```

5.12.5 stderr

5.13 part03test13

5.13.1 Diff

5.13.2 Input File

```
113,112,111,110,109,107,106,104,103,101,99,98,96,95,93,91,89,88,87,86,83,82,81,80,79,78,76,7
```

```
3,2,3,3,1,2,3,4,2,2,3,2,2,3
1,2,4,4,3,1,4,2,1,1,4,3,1,2
4,2,2,2,2,2,2,1,1,1,3,4,3,3
2,3,3,2,1,4,1,3,3,3,2,3,2,3
2,1,1,2,1,4,1,1,2,3,2,1,3,4
2,2,4,2,4,1,1,1,1,2,2,1,1,2
2,4,2,2,2,1,4,2,1,4,3,2,3,4
3,3,4,3,3,2,1,2,2,3,2,3,1,3
2,2,4,3,3,2,3,3,2,4,3,3,4,3
1,3,3,3,2,4,2,4,2,4,3,2,4,2
1,1,4,2,1,2,4,3,2,3,4,2,4,2
4,4,3,1,4,1,1,3,3,4,1,3,4,4
4,1,3,1,3,4,3,1,4,1,4,4,2,1
3,4,1,2,3,2,3,1,2,3,3,4,2,2
3,1,2,4,2,1,1,1,4,1,3,2,1,2
```

5.13.3 Submission Output
```

```
 1  32331234223223
 2  12443142114312
 3  42222221113433
 4  23321413332323
 5  21121411232134
 6  22424111122112
 7  24222142143234
 8  33433212232313
 9  22433233243343
10  13332424243242
11  11421243234242
12  44314113341344
13  41313431414421
14  34123231233422
15  31242111413212
16  -----------------
17  32331234223223
18  12443142114312
19  42222221113433
20  23321413332323
21  21121411232134
22  22424111122112
23  24222142143234
24  33433212232313
25  22433233243343
26  13332424243242
27  11421243234242
28  44314113341344
29  41313431414421
30  34123231233422
31  31242111413212
```

5.13.4   Solution Output

```
 1  32331234223223
 2  12443142114312
 3  42222221113433
 4  23321413332323
 5  21121411232134
 6  22424111122112
 7  24222142143234
 8  33433212232313
 9  22433233243343
10  13332424243242
11  11421243234242
12  44314113341344
13  41313431414421
14  34123231233422
15  31242111413212
16  -----------------
17  32331234223223
18  12443142114312
19  42222221113433
20  23321413332323
21  21121411232134
22  22424111122112
23  24222142143234
24  33433212232313
```

```
25  22433233243343
26  13332424243242
27  11421243234242
28  44314113341344
29  41313431414421
30  34123231233422
31  31242111413212
```

5.13.5 stderr

5.14 part03test14

5.14.1 Diff

5.14.2 Input File

```
58,57,55,54,53,51,50,49,48,47,44,43,42,40,39,38,36,35,34,33,32,30,29,24,22,20,19,18,15,14,13
```

```
1,3,2,3,3,2,1,2
3,1,2,2,3,1,2,2
1,2,1,1,2,1,3,3
2,1,3,3,2,2,1,1
2,3,2,1,1,1,3,1
2,2,2,3,2,3,2,3
2,2,1,3,1,1,1,2
3,3,2,1,3,2,3,2
2,3,2,3,1,3,1,3
1,2,2,1,1,3,1,2
3,1,3,1,1,1,2,2
1,1,1,3,2,3,3,3
3,3,2,1,2,1,3,3
1,1,2,3,1,2,2,1
```

5.14.3 Submission Output

```
 1  13233212
 2  31223122
 3  12112133
 4  21332211
 5  23211131
 6  22232323
 7  22131112
 8  33213232
 9  23231313
10  12211312
11  31311122
12  11132333
13  33212133
14  11231221
15  ------------------
16  13233212
```

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```
17  31223122
18  12112133
19  21332211
20  23211131
21  22232323
22  22131112
23  33213232
24  23231313
25  12211312
26  31311122
27  11132333
28  33212133
29  11231111
```

5.14.4   Solution Output

```
 1  13233212
 2  31223122
 3  12112133
 4  21332211
 5  23211131
 6  22232323
 7  22131112
 8  33213232
 9  23231313
10  12211312
11  31311122
12  11132333
13  33212133
14  11231221
15  -----------------
16  13233212
17  31223122
18  12112133
19  21332211
20  23211131
21  22232323
22  22131112
23  33213232
24  23231313
25  12211312
26  31311122
27  11132333
28  33212133
29  11231111
```

5.14.5   stderr

5.15   part03test15

5.15.1   Diff

5.15.2   Input File

```
13,12,11,10,8,7,1
```

```
1,1,1,2,1,1,2
2,1,1,2,2,1,1
2,2,2,1,1,1,2
1,1,1,1,1,2,1
2,1,2,1,2,2,2
1,2,2,1,1,2,2
1,2,1,1,1,2,1
2,1,1,1,2,1,1
```

5.15.3 Submission Output

```
 1  1112112
 2  2112211
 3  2221112
 4  1111121
 5  2121222
 6  1221122
 7  1211121
 8  2111211
 9  ------------------
10  1112112
11  2112211
12  2221112
13  1111121
14  2121222
15  1221122
16  1211121
17  1111211
```

5.15.4 Solution Output

```
 1  1112112
 2  2112211
 3  2221112
 4  1111121
 5  2121222
 6  1221122
 7  1211121
 8  2111211
 9  ------------------
10  1112112
11  2112211
12  2221112
13  1111121
14  2121222
15  1221122
16  1211121
17  1111211
```

5.15.5 stderr

5.16 part03test16

5.16.1 Diff

5.16.2 Input File

part03test16.moves.bff

40,39,38,37,36,35,34,33,30,29,28,27,26,25,24,23,22,21,20,19,18,17,16,15,14,13,12,11,10,9,8,7

part03test16.game.bff

```
2,2,1,2,2,2,2,2,2,1,1,2,1
2,2,2,2,1,1,1,2,2,2,2,2,2
2,2,2,1,1,2,1,2,1,2,2,1,1
1,2,2,2,1,2,1,1,2,1,1,2,1
1,1,1,1,2,2,2,2,1,1,1,2,1
2,2,1,2,1,1,1,2,1,1,1,1,1
2,1,1,2,2,1,2,1,1,2,1,1,2
2,1,2,1,2,2,1,2,1,2,2,2,1
1,2,2,1,2,2,1,2,2,2,1,2,1
1,2,1,1,2,1,1,2,2,2,2,2,1
2,1,1,1,2,1,2,1,1,2,2,1,1
2,1,2,1,1,1,2,1,1,1,1,2,1
2,2,1,2,1,2,2,1,1,2,1,1,2
1,1,2,2,1,2,2,1,1,1,2,1,1
1,2,1,1,2,1,1,2,1,2,1,1,2
```

5.16.3 Submission Output

part03test16.output

```
 1  2212222221121
 2  2222111222222
 3  2221121212211
 4  1222121121121
 5  1111222211121
 6  2212111211111
 7  2112212112112
 8  2121221212221
 9  1221221222121
10  1211211222221
11  2111212112211
12  2121112111121
13  2212122112112
14  1122122111211
15  1211211212112
16  ------------------
17  2212222221121
18  2222111222222
19  2221121212211
20  1222121121121
21  1111222211121
22  2212111211111
23  2112212112112
24  2121221212221
25  1221221222121
26  1211211222221
27  2111212112211
```

100

```
28  2121112111121
29  2212122112112
30  1122122111211
31  1211211212111
```

5.16.4   Solution Output

```
 1  2212222221121
 2  2222111222222
 3  2221121212211
 4  1222121121121
 5  1111222211121
 6  2212111211111
 7  2112212112112
 8  2121221212221
 9  1221221222121
10  1211211222221
11  2111212112211
12  2121112111121
13  2212122112112
14  1122122111211
15  1211211212112
16  -----------------
17  2212222221121
18  2222111222222
19  2221121212211
20  1222121121121
21  1111222211121
22  2212111211111
23  2112212112112
24  2121221212221
25  1221221222121
26  1211211222221
27  2111212112211
28  2121112111121
29  2212122112112
30  1122122111211
31  1211211212111
```

5.16.5   stderr

5.17   part03test17

5.17.1   Diff

5.17.2   Input File

```
36,29,22,20,16,8,1
```

```
2,2,2,2,2,3,1,1,1,1,2,2
3,3,2,3,1,2,2,1,1,1,2,1
2,2,1,3,2,1,3,2,1,1,1,2
```

```
1,2,1,2,2,2,3,2,2,3,3,1
1,3,2,3,2,2,3,1,3,2,2,2
1,2,2,2,3,3,1,1,2,2,3,2
1,2,2,2,2,1,1,1,1,2,2,3
3,2,1,3,2,2,1,3,3,2,3,3
2,1,3,2,3,3,1,2,1,1,3,2
```

5.17.3 Submission Output

```
 1  222223111122
 2  332312211121
 3  221321321112
 4  121222322331
 5  132322313222
 6  122233112232
 7  122221111223
 8  321322133233
 9  213233121132
10  ------------------
11  222223111122
12  332312211121
13  221321321112
14  121222322331
15  132322313222
16  122233112232
17  122221111223
18  321322133233
19  213133121132
```

5.17.4 Solution Output

```
 1  222223111122
 2  332312211121
 3  221321321112
 4  121222322331
 5  132322313222
 6  122233112232
 7  122221111223
 8  321322133233
 9  213233121132
10  ------------------
11  222223111122
12  332312211121
13  221321321112
14  121222322331
15  132322313222
16  122233112232
17  122221111223
18  321322133233
19  213133121132
```

5.17.5 stderr

5.18 part03test18

5.18.1 Diff

5.18.2 Input File

part03test18.moves.bff

74,73,72,71,70,69,68,67,66,65,64,63,62,61,60,59,58,57,56,55,54,53,52,51,50,49,48,47,46,45,44

part03test18.game.bff

```
2,3,4,3,4,1,4,3,1,3,2,2,3
3,2,3,3,4,2,3,1,1,3,2,4,4
1,1,3,4,1,3,3,1,4,3,3,4,2
3,3,3,1,1,2,3,4,2,4,3,2,4
1,1,1,3,1,4,2,1,4,2,2,4,4
1,3,2,3,1,1,2,1,1,2,2,4,2
1,4,4,4,2,1,3,1,2,2,3,2,2
4,2,3,4,1,4,4,2,2,3,1,4,2
4,2,3,4,3,1,2,2,4,4,1,2,2
4,2,3,4,1,1,2,3,4,2,2,4,2
3,3,3,2,3,2,2,1,2,2,4,1,1
2,3,4,4,1,1,4,4,4,4,4,3,1
1,4,3,4,2,2,4,2,1,2,4,2,4
```

5.18.3 Submission Output

part03test18.output

```
1   2343414313223
2   3233423113244
3   1134133143342
4   3331123424324
5   1113142142244
6   1323112112242
7   1444213122322
8   4234144223142
9   4234312244122
10  4234112342242
11  3332322122411
12  2344114444431
13  1434224212424
14  -----------------
15  2343414313223
16  3233423113244
17  1134133143342
18  3331123424324
19  1113142142244
20  1323112112242
21  1444213122322
22  4234144223142
23  4234312244122
24  4234112342242
25  3332322122411
26  2344114444431
27  1434224212421
```

5.18.4 Solution Output

part03test18.solution

```
1   2343414313223
2   3233423113244
```

```
 3  1134133143342
 4  3331123424324
 5  1113142142244
 6  1323112112242
 7  1444213122322
 8  4234144223142
 9  4234312244122
10  4234112342242
11  3332322122411
12  2344114444431
13  1434224212424
14  -----------------
15  2343414313223
16  3233423113244
17  1134133143342
18  3331123424324
19  1113142142244
20  1323112112242
21  1444213122322
22  4234144223142
23  4234312244122
24  4234112342242
25  3332322122411
26  2344114444431
27  1434224212421
```

5.18.5 stderr

5.19 part03test19

5.19.1 Diff

5.19.2 Input File

```
40,39,38,36,34,33,32,30,28,27,26,25,24,23,22,20,18,16,13,12,11,8,7,6,2,1
```

```
2,3,2,3,2,2,2,2,2
2,1,3,2,1,3,3,1,2
2,1,2,2,3,1,2,1,3
1,3,2,1,1,1,2,2,1
1,3,2,3,2,3,2,3,1
1,1,3,3,1,3,2,2,2
2,1,2,1,2,3,2,2,1
3,1,1,3,2,1,3,1,2
1,3,1,1,1,3,1,2,3
```

5.19.3 Submission Output

```
1  232322222
2  213213312
3  212231213
4  132111221
```

```
 5  132323231
 6  113313222
 7  212123221
 8  311321312
 9  131113123
10  -----------------
11  232322222
12  213213312
13  212231213
14  132111221
15  132323231
16  113313222
17  212123221
18  311321312
19  131113121
```

5.19.4 Solution Output

```
 1  232322222
 2  213213312
 3  212231213
 4  132111221
 5  132323231
 6  113313222
 7  212123221
 8  311321312
 9  131113123
10  -----------------
11  232322222
12  213213312
13  212231213
14  132111221
15  132323231
16  113313222
17  212123221
18  311321312
19  131113121
```

5.19.5 stderr

5.20 part03test20

5.20.1 Diff

5.20.2 Input File

```
16,8
```

```
1,1,2,2,1,2,2,2
1,2,2,2,1,1,1,2
2,1,1,1,2,2,1,2
2,1,2,1,1,2,2,1
```

```
1,1,1,1,1,2,1,2
1,2,1,2,1,2,1,1
2,1,1,2,1,2,1,2
2,2,1,2,2,2,1,1
1,1,2,2,2,1,2,1
1,1,2,2,2,1,2,2
2,2,1,1,1,1,1,1
1,2,2,2,2,1,2,2
2,2,1,1,1,1,2,1
2,2,2,1,1,2,1,2
2,1,1,1,1,1,2,2
```

5.20.3 Submission Output

part03test20.output

```
 1  11221222
 2  12221112
 3  21112212
 4  21211221
 5  11111212
 6  12121211
 7  21121212
 8  22122211
 9  11222121
10  11222122
11  22111111
12  12222122
13  22111121
14  22211212
15  21111122
16  -----------------
17  11221222
18  12221112
19  21112212
20  21211221
21  11111212
22  12121211
23  21121212
24  22122211
25  11222121
26  11222122
27  22111111
28  12222122
29  22111121
30  22211212
31  21111122
```

5.20.4 Solution Output

part03test20.solution

```
 1  11221222
 2  12221112
 3  21112212
 4  21211221
 5  11111212
 6  12121211
 7  21121212
 8  22122211
 9  11222121
10  11222122
```

106

```
11  22111111
12  12222122
13  22111121
14  22211212
15  21111122
16  ------------------
17  11221222
18  12221112
19  21112212
20  21211221
21  11111212
22  12121211
23  21121212
24  22122211
25  11222121
26  11222122
27  22111111
28  12222122
29  22111121
30  22211212
31  21111122
```

5.20.5 stderr

5.21 part03test21

5.21.1 Diff

5.21.2 Input File

```
23,15,14,13,10,8,7,3,1
```

```
1,3,2,1,1,1
3,3,1,3,1,1
3,1,1,3,3,3
1,2,1,1,1,1
3,1,2,3,1,1
3,1,1,2,1,3
3,1,2,3,2,2
1,3,1,2,3,1
```

5.21.3 Submission Output

```
1  132111
2  331311
3  311333
4  121111
5  312311
6  311213
7  312322
8  131231
9  ------------------
```

```
10  132111
11  331311
12  311333
13  121111
14  312311
15  311213
16  312322
17  131231
```

5.21.4 Solution Output

```
 1  132111
 2  331311
 3  311333
 4  121111
 5  312311
 6  311213
 7  312322
 8  131231
 9  -----------------
10  132111
11  331311
12  311333
13  121111
14  312311
15  311213
16  312322
17  131231
```

5.21.5 `stderr`

5.22 part03test22

5.22.1 Diff

5.22.2 Input File

```
31,30,29,23,17,11,10,8,5,2
```

```
1,2,2,2,2,2,2,1,2,1,2,2,2
2,1,1,2,2,2,2,1,1,1,1,1,2
1,1,1,2,1,2,2,1,2,2,2,2,2
2,2,2,1,1,1,2,1,1,1,2,1,1
1,2,2,1,1,1,1,1,1,1,1,1,2
1,1,2,1,2,1,2,2,1,2,2,1,1
2,1,1,1,2,1,2,2,2,1,1,1,2
2,2,2,2,1,2,2,1,1,1,1,2,2
1,2,1,2,2,1,2,1,2,1,1,1,1
2,1,2,1,1,1,2,2,1,1,1,1,2
2,1,1,2,1,2,1,1,2,1,1,1,2
1,2,1,2,2,1,2,2,1,1,2,2,2
```

5.22.3 Submission Output

<p align="center">part03test22.output</p>

```
 1  1222222121222
 2  2112222111112
 3  1112122122222
 4  2221112111211
 5  1221111111112
 6  1121212212211
 7  2111212221112
 8  2222122111122
 9  1212212121111
10  2121112211112
11  2112121121112
12  1212212211222
13  -----------------
14  1222222121222
15  2112222111112
16  1112122122222
17  2221112111211
18  1221111111112
19  1121212212211
20  2111212221112
21  2222122111122
22  1212212121111
23  2121112211112
24  2112121121112
25  1212211111222
```

5.22.4 Solution Output

<p align="center">part03test22.solution</p>

```
 1  1222222121222
 2  2112222111112
 3  1112122122222
 4  2221112111211
 5  1221111111112
 6  1121212212211
 7  2111212221112
 8  2222122111122
 9  1212212121111
10  2121112211112
11  2112121121112
12  1212212211222
13  -----------------
14  1222222121222
15  2112222111112
16  1112122122222
17  2221112111211
18  1221111111112
19  1121212212211
20  2111212221112
21  2222122111122
22  1212212121111
23  2121112211112
24  2112121121112
25  1212211111222
```

5.22.5 stderr

5.23 part03test23

5.23.1 Diff

part03test23.diff

5.23.2 Input File

part03test23.moves.bff

```
90,89,88,87,86,85,84,83,82,81,80,79,78,77,76,75,74,73,72,71,70,69,68,67,66,65,64,63,62,61,60
```

part03test23.game.bff

```
3,3,3,2,1,1,1,2,2,3,1,2,3,1,1
3,1,1,3,3,1,3,2,2,2,1,3,2,2,3
2,3,3,2,1,2,2,2,1,1,2,2,1,2,1
1,1,3,3,3,2,2,3,3,3,2,3,1,1,2
1,3,1,2,1,3,1,1,1,2,2,3,3,2,3
1,2,1,1,1,2,1,2,3,2,1,2,3,2,2
1,1,3,3,3,2,1,3,2,1,2,2,1,2,1
3,1,1,3,3,1,1,3,3,3,1,1,3,3,1
2,2,2,1,1,1,3,3,3,1,3,1,3,2,3
2,1,1,2,1,1,2,2,2,2,1,3,2,2,3
2,2,3,2,3,3,2,3,2,1,2,3,2,1,1
1,1,1,2,2,3,1,2,3,2,2,2,3,2,3
3,2,3,3,1,2,3,3,1,2,2,3,1,3,1
1,1,1,1,1,2,2,3,1,3,2,3,1,3,3
3,2,3,2,2,3,2,2,3,3,2,2,1,2,2
```

5.23.3 Submission Output

part03test23.output

```
 1  333211122312311
 2  311331322213223
 3  233212221122121
 4  113332233323112
 5  131213111223323
 6  121112123212322
 7  113332132122121
 8  311331133311331
 9  222111333131323
10  211211222213223
11  223233232123211
12  111223123222323
13  323312331223131
14  111112231323133
15  323223223322122
16  -----------------
17  333211122312311
18  311331322213223
19  233212221122121
20  113332233323112
21  131213111223323
22  121112123212322
23  113332132122121
24  311331133311331
25  222111333131323
```

110

```
26  211211222213223
27  223233232123211
28  111223123222323
29  323312331223131
30  111112231323133
31  323223223322111
```

5.23.4 Solution Output

```
 1  333211122312311
 2  311331322213223
 3  233212221122121
 4  113332233323112
 5  131213111223323
 6  121112123212322
 7  113332132122121
 8  311331133311331
 9  222111333131323
10  211211222213223
11  223233232123211
12  111223123222323
13  323312331223131
14  111112231323133
15  323223223322122
16  ------------------
17  333211122312311
18  311331322213223
19  233212221122121
20  113332233323112
21  131213111223323
22  121112123212322
23  113332132122121
24  311331133311331
25  222111333131323
26  211211222213223
27  223233232123211
28  111223123222323
29  323312331223131
30  111112231323133
31  323223223322111
```

5.23.5 stderr

5.24   part03test24

5.24.1 Diff

5.24.2 Input File

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

```
2,1,1,1,1,3,1,2
```

```
1,3,1,2,2,1,1,1
3,1,1,1,1,1,1,3
3,2,2,2,3,3,1,1
3,3,1,2,1,2,2,2
3,2,2,3,2,2,1,3
3,1,1,2,3,1,3,2
```

5.24.3   Submission Output

```
1   21111312
2   13122111
3   31111113
4   32223311
5   33121222
6   32232213
7   31123132
8   ------------------
9   21111312
10  13122111
11  31111113
12  32223311
13  33121222
14  32232213
15  31123131
```

5.24.4   Solution Output

```
1   21111312
2   13122111
3   31111113
4   32223311
5   33121222
6   32232213
7   31123132
8   ------------------
9   21111312
10  13122111
11  31111113
12  32223311
13  33121222
14  32232213
15  31123131
```

5.24.5   stderr

5.25   part03test25

5.25.1   Diff

5.25.2   Input File

```
29,24,22,19,17,14,11,9,7,3
```

```
2,1,2,1,2,1,2,1,2,1,2
1,1,2,2,2,2,1,2,2,1,1
1,2,2,1,2,2,2,1,2,2,2
1,2,1,2,2,2,1,2,1,1,2
2,2,2,1,2,2,2,1,1,1,1
2,1,1,1,2,1,1,2,2,1,2
1,2,2,1,2,2,1,1,2,2,1
2,2,2,1,2,2,2,2,2,1,1
1,2,1,2,1,2,1,2,2,2,2
1,2,2,1,1,1,2,2,2,2,2
1,1,1,1,1,2,2,2,1,2,1
2,1,1,1,2,1,1,1,2,2,1
2,2,2,2,2,1,2,2,1,1,1
```

5.25.3 Submission Output

```
 1  21212121212
 2  11222212211
 3  12212221222
 4  12122212112
 5  22212221111
 6  21112112212
 7  12212211221
 8  22212222211
 9  12121212222
10  12211122222
11  11111222121
12  21112111221
13  22222122111
14  ------------------
15  21212121212
16  11222212211
17  12212221222
18  12122212112
19  22212221111
20  21112112212
21  12212211221
22  22212222211
23  12121212222
24  12211122222
25  11111222121
26  21112111221
27  22222122111
```

5.25.4 Solution Output

```
 1  21212121212
 2  11222212211
 3  12212221222
 4  12122212112
 5  22212221111
 6  21112112212
 7  12212211221
 8  22212222211
 9  12121212222
10  12211122222
11  11111222121
```

113

```
12  21112111221
13  22222122111
14  -----------------
15  21212121212
16  11222212211
17  12212221222
18  12122212112
19  22212221111
20  21112112212
21  12212211221
22  22212222211
23  12121212222
24  12211122222
25  11111222121
26  21112111221
27  22222122111
```

5.25.5 stderr

5.26 part03test26

5.26.1 Diff

5.26.2 Input File

```
11,1
```

```
1,1,2,1,1,2
2,1,1,2,1,2
2,1,1,1,2,2
1,2,1,2,1,1
2,1,1,2,1,2
2,1,1,2,2,1
1,2,2,1,1,1
2,1,2,2,2,2
1,1,2,1,2,1
2,2,1,2,1,2
2,1,2,2,1,1
```

5.26.3 Submission Output

```
 1  112112
 2  211212
 3  211122
 4  121211
 5  211212
 6  211221
 7  122111
 8  212222
 9  112121
10  221212
11  212211
```

```
12  -----------------
13  112112
14  211212
15  211122
16  121211
17  111212
18  111221
19  122111
20  212222
21  112121
22  221212
23  212211
```

5.26.4 Solution Output

```
 1  112112
 2  211212
 3  211122
 4  121211
 5  211212
 6  211221
 7  122111
 8  212222
 9  112121
10  221212
11  212211
12  -----------------
13  112112
14  211212
15  211122
16  121211
17  111212
18  111221
19  122111
20  212222
21  112121
22  221212
23  212211
```

5.26.5 `stderr`

part03test26.err

5.27 part03test27

5.27.1 Diff

part03test27.diff

5.27.2 Input File

part03test27.moves.bff

```
81,80,79,77,76,73,72,71,69,67,65,64,63,61,60,57,56,54,53,52,51,50,47,46,45,44,43,41,40,38,37
```

part03test27.game.bff

```
4,4,3,4,3,1,4,2,3,3
4,1,4,4,2,1,1,1,3,4
```

```
2,2,2,1,1,3,1,1,4,2
3,1,4,2,2,1,3,2,3,1
1,1,3,4,3,2,4,4,3,1
2,3,4,2,1,3,4,4,2,1
1,4,3,4,4,4,3,2,4,4
1,4,1,3,1,2,4,1,1,3
4,2,4,3,1,3,1,3,2,3
3,3,4,3,2,4,2,3,1,3
3,4,3,2,2,4,1,4,2,1
3,3,2,1,4,1,2,1,3,1
1,2,3,3,4,2,4,1,1,4
```

5.27.3 Submission Output

```
 1   4434314233
 2   4144211134
 3   2221131142
 4   3142213231
 5   1134324431
 6   2342134421
 7   1434443244
 8   1413124113
 9   4243131323
10   3343242313
11   3432241421
12   3321412131
13   1233424114
14   ------------------
15   4434314233
16   4144211134
17   2221131142
18   3142213231
19   1134324431
20   2342134421
21   1434443244
22   1413124113
23   4243131323
24   3343242313
25   3432241421
26   3321412131
27   1233421114
```

5.27.4 Solution Output

```
 1   4434314233
 2   4144211134
 3   2221131142
 4   3142213231
 5   1134324431
 6   2342134421
 7   1434443244
 8   1413124113
 9   4243131323
10   3343242313
11   3432241421
12   3321412131
13   1233424114
14   ------------------
```

```
15  4434314233
16  4144211134
17  2221131142
18  3142213231
19  1134324431
20  2342134421
21  1434443244
22  1413124113
23  4243131323
24  3343242313
25  3432241421
26  3321412131
27  1233421114
```

5.27.5 stderr

5.28 part03test28

5.28.1 Diff

5.28.2 Input File

part03test28.moves.bff

```
21 ,20 ,19 ,18 ,17 ,16 ,15 ,14 ,13 ,12 ,11 ,10 ,9 ,8 ,7 ,6 ,5 ,4 ,3 ,2
```

part03test28.game.bff

```
1,1,2,2,1,1,2,2,2,2
1,2,1,2,1,1,2,1,1,2
2,2,1,1,2,1,2,2,2,1
1,2,1,1,1,1,2,1,2,2
2,2,1,2,2,2,1,1,2,2
2,1,1,2,2,1,1,2,1,2
1,1,1,1,1,1,1,2,2,2
1,2,1,2,1,2,1,1,1,1
2,1,1,2,2,1,2,2,2,1
2,2,1,2,1,1,1,2,2,2
2,2,1,2,2,1,2,2,2,1
2,1,2,2,2,2,2,2,2,2
2,1,1,1,2,1,2,2,1,1
2,1,1,2,2,1,2,2,1,2
```

5.28.3 Submission Output

part03test28.output

```
 1  1122112222
 2  1212112112
 3  2211212221
 4  1211112122
 5  2212221122
 6  2112211212
 7  1111111222
 8  1212121111
 9  2112212221
10  2212111222
11  2212212221
```

117
```

```
12  2122222222
13  2111212211
14  2112212212
15  -----------------
16  1122112222
17  1212112112
18  2211212221
19  1211112122
20  2212221122
21  2112211212
22  1111111222
23  1212121111
24  2112212221
25  2212111222
26  2212212221
27  2122222222
28  2111212211
29  2112212211
```

5.28.4 Solution Output

```
 1  1122112222
 2  1212112112
 3  2211212221
 4  1211112122
 5  2212221122
 6  2112211212
 7  1111111222
 8  1212121111
 9  2112212221
10  2212111222
11  2212212221
12  2122222222
13  2111212211
14  2112212212
15  -----------------
16  1122112222
17  1212112112
18  2211212221
19  1211112122
20  2212221122
21  2112211212
22  1111111222
23  1212121111
24  2112212221
25  2212111222
26  2212212221
27  2122222222
28  2111212211
29  2112212211
```

5.28.5 stderr

5.29 part03test29

5.29.1 Diff
```

5.29.2 Input File

```
26,23,20,19,12,10,4
```

```
2,2,3,3,1,2,2,3,3,3,3
3,2,3,2,1,2,2,2,3,1,1
3,2,1,2,3,1,2,3,2,2,2
1,1,2,1,3,3,2,2,1,2,3
2,1,1,1,3,2,3,2,3,2,1
1,1,3,2,1,1,3,3,2,2,1
2,2,3,2,2,2,2,1,3,3,1
```

5.29.3 Submission Output

```
 1  22331223333
 2  32321222311
 3  32123123222
 4  11213322123
 5  21113232321
 6  11321133221
 7  22322221331
 8  -----------------
 9  22331223333
10  32321222311
11  32123123222
12  11213322123
13  21113232321
14  11321133221
15  11322221331
```

5.29.4 Solution Output

```
 1  22331223333
 2  32321222311
 3  32123123222
 4  11213322123
 5  21113232321
 6  11321133221
 7  22322221331
 8  -----------------
 9  22331223333
10  32321222311
11  32123123222
12  11213322123
13  21113232321
14  11321133221
15  11322221331
```

5.29.5 stderr

5.30 part03test30

5.30.1 Diff

part03test30.diff

5.30.2 Input File

part03test30.moves.bff

```
23,22,21,20,19,18,17,16,15,14,13,12,10,9,8,7,6,5,4,3,1
```

part03test30.game.bff

```
2,1,2,2,2,1,2,1,2,2,1,2,1,2,2
2,2,2,1,1,1,2,2,2,2,1,1,2,1,1
2,1,1,2,2,2,2,2,2,2,1,1,1,2,2
1,1,1,2,1,2,2,2,2,1,2,2,2,1,2
1,1,1,1,1,1,2,2,1,2,1,1,2,2,1
2,1,2,2,1,1,2,2,2,2,1,2,2,1,2
```

5.30.3 Submission Output

part03test30.output

```
 1  212221212212122
 2  222111222211211
 3  211222222211122
 4  111212222122212
 5  111111221211221
 6  212211222212212
 7  -----------------
 8  212221212212122
 9  222111222211211
10  211222222211122
11  111212222122212
12  111111221211221
13  212211222212211
```

5.30.4 Solution Output

part03test30.solution

```
 1  212221212212122
 2  222111222211211
 3  211222222211122
 4  111212222122212
 5  111111221211221
 6  212211222212212
 7  -----------------
 8  212221212212122
 9  222111222211211
10  211222222211122
11  111212222122212
12  111111221211221
13  212211222212211
```

5.30.5 stderr

part03test30.err

5.31 Source Code

120

```
 1  module.exports = {
 2      manyPlayersOneMove: manyPlayersOneMove
 3  }
 4
 5  var helpers = require( './helpers' );
 6
 7  function manyPlayersOneMove( game ){
 8
 9      function whatever( move ){
10                  var clusters = [];
11                  var clusterCounter = 1;
12                  var numberOfMatches = 0;
13                  var lengthOfRow = game.length;
14                  var lengthOfColumn = game[0].length;
15                  var copy = [];
16
17                  // Initialize first row
18                  clusters[0] = [];
19                  clusters[0][0] = 1;
20                  copy[0] = [];
21                  copy[0][0] = 1;
22
23                  for(var row = 1; row < lengthOfColumn; row++ ){
24                          if(game[0][row] == game[0][row-1]){
25                                  clusters[0][row] = clusterCounter;
26                                  copy[0][row] = clusterCounter;
27                          }
28
29                          else{
30                                  clusterCounter++;
31                                  clusters[0][row] = clusterCounter;
32                                  copy[0][row] = clusterCounter;
33                          }
34                  }
35
36                  // Take care of every other row
37                  for(var r = 1; r < lengthOfRow; r++){
38                          clusters[r] = [];
39                          copy[r] = [];
40
41                          for(var c = 0; c < lengthOfColumn; c++){
42
43                                  if(c == 0){
44                                          clusterCounter++;
45                                          clusters[r][c] = clusterCounter;
46                                          copy[r][c] = clusterCounter;
47                                  }
48                                  else if(game[r][c] == game[r][c-1]){
49                                          clusters[r][c] = clusterCounter;
50                                          copy[r][c] = clusterCounter;
51                                  }
52
53                                  else{
54                                          clusterCounter++;
55                                          clusters[r][c] = clusterCounter;
56                                          copy[r][c] = clusterCounter;
57                                  }
58                          }
59                  }
```

```
60
61                     // Combine clusters with the same value
62                     for(var ro = 1; ro < lengthOfRow; ro++){
63                             for(var co = 0; co < lengthOfColumn; co++){
64                                     if(game[ro][co] == game[ro-1][co]){
65                                             var valueToMatch = clusters[ro][co];
66                                             var valueToTurn = clusters[ro-1][co];
67
68                                             for(var newRo = 0; newRo < lengthOfRow; newRo
     ++){
69                                                     for(var newCo = 0; newCo <
     lengthOfColumn; newCo++){
70                                                             if(clusters[newRo][newCo] ==
     valueToMatch){
71                                                                     clusters[newRo][newCo]
      = valueToTurn;
72                                                             }
73                                                     }
74                                             }
75
76                                     }
77                             }
78                     }
79
80                     var newClusterCounter = 1;
81
82                     // Reduce cluster values
83                     for(var row = 0; row < lengthOfRow; row++){
84                             for(var col = 0; col < lengthOfColumn; col++){
85                                     if(copy[row][col] != null){
86                                             var searchValue = clusters[row][col];
87                                             copy[row][col] = null;
88
89                                             for(var r = 0; r < lengthOfRow; r++){
90                                                     for(var c = 0; c < lengthOfColumn; c
     ++){
91                                                             if(clusters[r][c] ==
     searchValue){
92                                                                     clusters[r][c] =
     newClusterCounter;
93                                                                     copy[r][c] = null;
94                                                             }
95                                                     }
96                                             }
97
98                                             newClusterCounter++;
99                                     }
100                            }
101                    }
102
103                    // Find the move to make and change the cluster
104                    for(var row = 0; row < lengthOfRow; row++){
105                            for(var col = 0; col < lengthOfColumn; col++){
106
107                                    if(clusters[row][col] == move){
108                                            game[row][col] = 1;
109                                    }
110                            }
111                    }
112
```

```
113                    return game;
114        }
115
116    return whatever;
117 }
```

Chapter 6

csce322h0mework02part04.js

6.1 part04test01

6.1.1 Diff

6.1.2 Input File

part04test01.moves.bff

```
117,115,114,112,111,110,106,105,103,100,98,97,95,92,91,90,87,83,81,80,76,75,74,73,72,71,69,6
```

part04test01.game.bff

```
3,3,4,3,2,4,2,2,4,4,4,2,4,4
2,4,4,2,2,1,2,1,2,4,3,1,2,1
2,2,2,1,3,4,2,2,1,3,3,4,1,4
4,4,4,4,3,4,2,1,2,3,4,3,3,3
2,1,4,4,3,3,4,2,4,4,2,4,1,3
2,2,1,1,3,1,1,1,3,4,4,1,1,3
3,3,1,3,3,3,2,3,1,2,1,4,2,3
1,1,3,3,1,3,1,4,3,2,3,2,3,1
2,1,2,1,3,4,4,2,3,1,1,4,3,4
4,2,1,3,2,1,4,1,1,4,1,2,4,3
1,4,3,2,3,3,3,4,3,4,2,1,2,4
4,3,3,1,2,3,3,3,2,2,1,3,1,3
4,1,4,2,3,3,3,1,3,4,2,1,2,1
1,2,2,3,2,4,3,2,3,1,3,2,1,4
```

6.1.3 Submission Output

part04test01.output

```
 1   33432422444244
 2   24422121243121
 3   22213422133414
 4   44443421234333
 5   21443342442413
 6   22113111344113
 7   33133323121423
 8   11331314323231
 9   21213442311434
10   42132141141243
11   14323334342124
12   43312333221313
13   41423331342121
```

```
14  12232432313214
15  ---------------
16  33132433333144
17  21122131333122
18  22213433133414
19  44443431234444
20  21443342442414
21  22223111344114
22  22233323423424
23  22332344423211
24  42312444444414
25  42332444434213
26  14333334332114
27  43343333221313
28  44323332341143
29  12232134313233
```

6.1.4 Solution Output

```
 1  33432422444244
 2  24422121243121
 3  22213422133414
 4  44443421234333
 5  21443342442413
 6  22113111344113
 7  33133323121423
 8  11331314323231
 9  21213442311434
10  42132141141243
11  14323334342124
12  43312333221313
13  41423331342121
14  12232432313214
15  ---------------
16  33132433333144
17  21122131333122
18  22213433133414
19  44443431234444
20  21443342442414
21  22223111344114
22  22233323423424
23  22332344423211
24  42312444444414
25  42332444434213
26  14333334332114
27  43343333221313
28  44323332341143
29  12232134313233
```

6.1.5 stderr

6.2 part04test02

6.2.1 Diff

6.2.2 Input File

<div align="center">part04test02.moves.bff</div>

```
22,21,20,19,18,17,16,15,14,13,12,11,10,9,8,7,6,5,4,3,2,1
```

<div align="center">part04test02.game.bff</div>

```
2,2,2,2,1,2,1,2
1,1,1,2,2,1,2,2
1,1,2,1,2,2,1,1
2,1,1,1,1,2,2,1
1,1,1,1,2,2,1,1
1,2,2,2,1,1,1,2
2,2,2,1,1,2,1,1
2,2,1,1,1,1,1,2
1,1,2,2,2,1,2,1
2,2,2,1,2,1,2,1
2,2,1,1,1,1,1,1
1,1,2,2,1,2,1,2
2,1,1,2,1,1,1,2
```

6.2.3 Submission Output

<div align="center">part04test02.output</div>

```
1   22221212
2   11122122
3   11212211
4   21111221
5   11112211
6   12221112
7   22211211
8   22111112
9   11222121
10  22212121
11  22111111
12  11221212
13  21121112
14  ----------------
15  22221212
16  22222122
17  22222222
18  22222222
19  22222222
20  22222222
21  22222222
22  22222222
23  22222222
24  22222222
25  22222222
26  22222222
27  22222222
```

6.2.4 Solution Output

<div align="center">part04test02.solution</div>

```
1   22221212
2   11122122
3   11212211
4   21111221
5   11112211
```

<div align="center">126</div>

```
 6  12221112
 7  22211211
 8  22111112
 9  11222121
10  22212121
11  22111111
12  11221212
13  21121112
14  ----------------
15  22221212
16  22222122
17  22222222
18  22222222
19  22222222
20  22222222
21  22222222
22  22222222
23  22222222
24  22222222
25  22222222
26  22222222
27  22222222
```

6.2.5   stderr

6.3   part04test03

6.3.1   Diff

6.3.2   Input File

```
48,47,44,38,33,29,25,20,16,14,8,7
```

```
2,3,3,3,1,3,3,3,2,4,4,1
1,4,3,1,4,2,2,4,3,3,4,3
3,1,1,4,2,3,4,2,4,3,1,4
1,3,1,3,2,2,1,4,1,1,1,1
2,4,2,2,4,4,4,1,1,1,2,4
2,2,3,3,4,1,3,1,1,3,4,2
1,3,1,4,1,2,4,4,4,3,4,4
```

6.3.3   Submission Output

```
 1  233313332441
 2  143142243343
 3  311423424314
 4  131322141111
 5  242244411124
 6  223341311342
 7  131412444344
 8  ----------------
 9  233313332444
```

127

```
10  343142242243
11  333424424213
12  333322241111
13  243344411124
14  223344311342
15  131444222344
```

6.3.4   Solution Output

```
 1  233313332441
 2  143142243343
 3  311423424314
 4  131322141111
 5  242244411124
 6  223341311342
 7  131412444344
 8  ---------------
 9  233313332444
10  343142242243
11  333424424213
12  333322241111
13  243344411124
14  223344311342
15  131444222344
```

6.3.5   stderr

6.4   part04test04

6.4.1   Diff

6.4.2   Input File

67,66,63,56,55,54,52,51,50,47,46,43,42,38,36,35,32,29,28,27,25,22,18,16,11,10,7,6,1

```
1,2,1,2,1,2,2,3,2,2,1,2,3,3
1,1,3,2,1,4,4,4,3,3,1,1,2,2
4,1,2,3,4,1,4,1,3,2,2,3,3,3
4,2,4,4,2,3,3,2,4,1,4,3,1,3
3,1,3,2,3,4,3,4,2,1,1,2,3,2
2,2,4,4,4,1,1,3,4,1,1,1,4,2
2,3,2,2,1,1,4,2,4,1,4,2,3,2
1,1,2,3,4,3,4,4,4,2,4,2,2,2
1,4,1,1,2,4,1,1,2,3,4,2,2,1
```

6.4.3   Submission Output

```
 1  12121223221233
 2  11321444331122
 3  41234141322333
 4  42442332414313
```

128

```
 5  31323434211232
 6  22444113411142
 7  23221142414232
 8  11234344424222
 9  14112411234221
10  ---------------
11  12121443221211
12  11321444331122
13  41234141322333
14  42112333344313
15  31111234344214
16  22111332444444
17  21113342444444
18  11111344424444
19  14112311224441
```

6.4.4 Solution Output

```
 1  12121223221233
 2  11321444331122
 3  41234141322333
 4  42442332414313
 5  31323434211232
 6  22444113411142
 7  23221142414232
 8  11234344424222
 9  14112411234221
10  ---------------
11  12121443221211
12  11321444331122
13  41234141322333
14  42112333344313
15  31111234344214
16  22111332444444
17  21113342444444
18  11111344424444
19  14112311224441
```

6.4.5 stderr

6.5 part04test05

6.5.1 Diff

6.5.2 Input File

```
16,15,14,13,12,11,10,9,8,7,6,5,4,3,2
```

```
2,2,2,1,2,1,2,2
1,1,2,2,1,2,1,1
2,1,1,2,2,1,2,1
2,2,1,2,1,1,2,2
```

```
2,2,2,2,1,1,2,1
2,2,1,1,1,2,2,1
2,2,2,1,2,1,1,1
1,2,2,1,2,2,1,1
2,1,1,1,1,1,2,1
```

6.5.3 Submission Output

```
1   22212122
2   11221211
3   21122121
4   22121122
5   22221121
6   22111221
7   22212111
8   12212211
9   21111121
10  ----------------
11  22212222
12  11222222
13  21122222
14  22122222
15  22222222
16  22222222
17  22222222
18  22222222
19  22222222
```

6.5.4 Solution Output

```
1   22212122
2   11221211
3   21122121
4   22121122
5   22221121
6   22111221
7   22212111
8   12212211
9   21111121
10  ----------------
11  22212222
12  11222222
13  21122222
14  22122222
15  22222222
16  22222222
17  22222222
18  22222222
19  22222222
```

6.5.5 stderr

6.6 part04test06

6.6.1 Diff

6.6.2 Input File

```
33,28,27,23,21,17,12,9,7,2,1
```

```
3,3,1,2,1,2,1,3
2,3,1,3,1,3,2,3
2,3,3,1,1,2,1,3
3,3,1,3,1,3,2,2
2,3,3,1,1,2,2,3
1,3,1,3,1,3,3,2
1,3,1,1,3,2,3,3
1,2,2,2,2,1,1,3
3,2,3,2,2,3,2,1
```

6.6.3 Submission Output

```
 1  33121213
 2  23131323
 3  23311213
 4  33131322
 5  23311223
 6  13131332
 7  13113233
 8  12222113
 9  32322321
10  ----------------
11  22121213
12  22121323
13  22211113
14  22131333
15  22211333
16  12231112
17  12223211
18  12222221
19  32322321
```

6.6.4 Solution Output

```
 1  33121213
 2  23131323
 3  23311213
 4  33131322
 5  23311223
 6  13131332
 7  13113233
 8  12222113
 9  32322321
10  ----------------
11  22121213
12  22121323
13  22211113
14  22131333
15  22211333
```

```
16  12231112
17  12223211
18  12222221
19  32322321
```

6.6.5 stderr

6.7 part04test07

6.7.1 Diff

6.7.2 Input File

```
26,25,24,22,20,18,17,16,15,13,11,10,9,7,2,1
```

```
2,2,2,1,2,2,2,1,2,2
1,2,1,1,2,2,2,2,2,1
1,2,2,2,1,1,2,1,2,1
2,1,2,1,2,2,1,2,2,2
1,1,1,2,1,1,1,2,2,1
2,1,2,1,1,2,1,2,2,1
1,1,2,2,2,2,2,2,2,2
2,1,2,2,2,1,2,1,1,2
2,1,1,2,1,2,1,2,2,1
2,1,1,1,2,2,2,2,2,1
2,1,2,2,1,2,1,2,2,2
```

6.7.3 Submission Output

```
 1  2221222122
 2  1211222221
 3  1222112121
 4  2121221222
 5  1112111221
 6  2121121221
 7  1122222222
 8  2122212112
 9  2112121221
10  2111222221
11  2122121222
12  ----------------
13  2221222122
14  1211222221
15  1222112221
16  2221222222
17  2222222221
18  2222222221
19  2222222222
20  2222222112
21  2222122221
22  2222222221
23  2222221222
```

132

6.7.4 Solution Output

```
 1  2221222122
 2  1211222221
 3  1222112121
 4  2121221222
 5  1112111221
 6  2121121221
 7  1122222222
 8  2122212112
 9  2112121221
10  2111222221
11  2122121222
12  ----------------
13  2221222122
14  1211222221
15  1222112221
16  2221222222
17  2222222221
18  2222222221
19  2222222222
20  2222222112
21  2222122221
22  2222222221
23  2222221222
```

6.7.5 stderr

6.8 part04test08

6.8.1 Diff

6.8.2 Input File

```
29,28,26,24,23,22,21,19,18,16,15,14,12,11,9,7,6,4,3,2
```

```
2,1,1,2,1,2,2,2,2,2,2,1,1,1
2,1,2,1,1,2,1,2,2,2,1,1,1,1
1,2,1,2,1,1,2,1,1,1,1,2,1,2
2,1,2,2,2,2,1,2,1,1,2,2,2,2
2,1,2,1,2,2,2,2,2,1,1,2,1,2
1,1,2,2,2,2,2,1,1,1,2,1,2,1
2,1,1,1,2,2,2,1,2,2,2,2,1,1
2,2,1,2,1,2,1,2,2,1,1,2,2,2
2,2,2,1,1,1,1,2,1,1,2,2,2,1
2,1,2,2,2,1,2,1,2,1,1,2,2,2
```

6.8.3 Submission Output

```
 1  21121222222111
```

133

```
 2  21211212221111
 3  12121121111212
 4  21222212112222
 5  21212222211212
 6  11222221112121
 7  21112221222211
 8  22121212211222
 9  22211112112221
10  21222121211222
11  ---------------
12  2222222222222
13  2222222222222
14  2222222222222
15  2222222222222
16  2222222222222
17  2222222222222
18  2222222222222
19  2222222222222
20  2222222112222
21  2222222121222
```

6.8.4 Solution Output

```
 1  21121222222111
 2  21211212221111
 3  12121121111212
 4  21222212112222
 5  21212222211212
 6  11222221112121
 7  21112221222211
 8  22121212211222
 9  22211112112221
10  21222121211222
11  ---------------
12  2222222222222
13  2222222222222
14  2222222222222
15  2222222222222
16  2222222222222
17  2222222222222
18  2222222222222
19  2222222222222
20  2222222112222
21  2222222121222
```

6.8.5 stderr

6.9 part04test09

6.9.1 Diff

6.9.2 Input File

78,75,74,72,70,69,67,66,65,64,57,56,55,54,51,47,42,41,38,37,35,33,32,30,29,26,21,17,13,12,10

```
2,3,2,2,1,3,2,4,3
3,1,2,3,1,1,1,2,2
3,3,1,2,4,2,3,4,4
2,4,1,2,2,4,4,4,1
2,4,2,2,1,2,3,1,1
1,3,4,4,3,1,4,2,1
3,2,3,2,2,2,3,4,2
2,3,1,2,3,4,2,2,2
1,2,2,4,4,2,1,3,4
1,4,2,4,3,2,1,1,3
1,1,4,2,3,1,3,1,2
3,2,3,1,1,1,1,3,3
2,4,3,3,2,4,3,4,4
2,3,2,4,1,4,3,2,1
4,3,1,4,4,2,2,4,1
```

6.9.3 Submission Output

```
 1  232213243
 2  312311122
 3  331242344
 4  241224441
 5  242212311
 6  134431421
 7  323222342
 8  231234222
 9  122442134
10  142432113
11  114231312
12  323111133
13  243324344
14  232414321
15  431442241
16  ---------------
17  232212241
18  332411122
19  331242444
20  241224443
21  242212333
22  124431423
23  323111343
24  231114333
25  111444134
26  131434113
27  111134312
28  323444433
29  223344344
30  221444323
31  221442233
```

6.9.4 Solution Output

```
 1  232213243
```

```
 2  312311122
 3  331242344
 4  241224441
 5  242212311
 6  134431421
 7  323222342
 8  231234222
 9  122442134
10  142432113
11  114231312
12  323111133
13  243324344
14  232414321
15  431442241
16  ---------------
17  232212241
18  332411122
19  331242444
20  241224443
21  242212333
22  124431423
23  323111343
24  231114333
25  111444134
26  131434113
27  111134312
28  323444433
29  223344344
30  221444323
31  221442233
```

6.9.5 stderr

6.10 part04test10

6.10.1 Diff

6.10.2 Input File

```
57,56,55,54,51,48,46,44,43,41,39,38,37,34,30,29,28,27,25,23,22,21,20,16,14,13,12,7,4,3,2,1
```

```
2,3,1,2,2,1,3,2,1,3
3,1,1,2,3,3,3,3,2,3
1,1,2,1,3,1,2,2,2,3
2,3,3,1,1,1,1,1,1,3
1,3,3,2,1,1,3,2,1,1
1,1,3,1,3,1,3,3,1,3
2,1,3,3,1,3,2,2,1,2
2,3,1,2,3,3,2,1,3,3
3,2,1,3,3,1,2,2,3,2
2,1,3,2,2,2,2,2,3,2
2,3,3,2,2,3,1,3,3,3
```

```
1,2,1,3,2,2,1,1,1,2
1,2,2,2,1,3,1,3,3,2
2,3,1,2,1,1,2,2,3,3
2,3,1,2,1,2,1,3,1,2
```

6.10.3 Submission Output

part04test10.output

```
 1  2312213213
 2  3112333323
 3  1121312223
 4  2331111113
 5  1332113211
 6  1131313313
 7  2133132212
 8  2312332133
 9  3213312232
10  2132222232
11  2332231333
12  1213221112
13  1222131332
14  2312112233
15  2312121312
16  ----------------
17  2112213113
18  1112333323
19  1122322223
20  1112222223
21  1112223222
22  1112223322
23  2111212222
24  2121112233
25  3221122232
26  2222222232
27  2222232333
28  2222222222
29  2222232332
30  2222222233
31  2222223212
```

6.10.4 Solution Output

part04test10.solution

```
 1  2312213213
 2  3112333323
 3  1121312223
 4  2331111113
 5  1332113211
 6  1131313313
 7  2133132212
 8  2312332133
 9  3213312232
10  2132222232
11  2332231333
12  1213221112
13  1222131332
14  2312112233
15  2312121312
16  ----------------
17  2112213113
```

```
18  1112333323
19  1122322223
20  1112222223
21  1112223222
22  1112223322
23  2111212222
24  2121112233
25  3221122232
26  2222222232
27  2222232333
28  2222222222
29  2222232332
30  2222222233
31  2222223212
```

6.10.5 stderr

6.11 part04test11

6.11.1 Diff

6.11.2 Input File

```
6
```

```
2,2,1,1,2,1,2
2,2,1,2,2,1,1
2,2,1,1,2,2,2
2,2,1,2,1,2,1
1,2,1,2,2,1,2
2,1,2,2,2,1,1
2,1,2,2,1,2,2
1,1,1,1,2,2,2
1,1,1,2,1,1,1
1,1,2,2,2,1,2
2,1,1,1,1,1,2
1,1,2,2,2,2,2
2,2,2,2,1,1,2
2,2,1,2,1,2,2
```

6.11.3 Submission Output

```
 1  2211212
 2  2212211
 3  2211222
 4  2212121
 5  1212212
 6  2122211
 7  2122122
 8  1111222
 9  1112111
10  1122212
```

```
11  2111112
12  1122222
13  2222112
14  2212122
15  ----------------
16  2211212
17  2212211
18  2211222
19  2211121
20  1211112
21  2111111
22  2111122
23  1111222
24  1112111
25  1122212
26  2111112
27  1122222
28  2222112
29  2212122
```

6.11.4 Solution Output

```
 1  2211212
 2  2212211
 3  2211222
 4  2212121
 5  1212212
 6  2122211
 7  2122122
 8  1111222
 9  1112111
10  1122212
11  2111112
12  1122222
13  2222112
14  2212122
15  ----------------
16  2211212
17  2212211
18  2211222
19  2211121
20  1211112
21  2111111
22  2111122
23  1111222
24  1112111
25  1122212
26  2111112
27  1122222
28  2222112
29  2212122
```

6.11.5 stderr

6.12 part04test12

6.12.1 Diff

139

6.12.2 Input File

```
16,15,14,10,3
```

```
2,2,3,3,1,2,2,1,2,3
1,3,3,3,3,1,2,2,2,1
1,3,1,1,3,1,2,1,1,3
1,1,2,1,2,3,3,2,2,2
2,3,2,1,3,1,1,1,2,3
1,2,1,3,3,3,1,1,3,1
```

6.12.3 Submission Output

```
 1  2233122123
 2  1333312221
 3  1311312113
 4  1121233222
 5  2321311123
 6  1213331131
 7  ----------------
 8  2233222123
 9  1333312221
10  1311312113
11  1121222111
12  3321311113
13  1213331131
```

6.12.4 Solution Output

```
 1  2233122123
 2  1333312221
 3  1311312113
 4  1121233222
 5  2321311123
 6  1213331131
 7  ----------------
 8  2233222123
 9  1333312221
10  1311312113
11  1121222111
12  3321311113
13  1213331131
```

6.12.5 stderr

6.13 part04test13

6.13.1 Diff

6.13.2 Input File

73,71,69,68,67,66,65,63,62,61,60,59,58,56,54,53,52,51,50,49,48,47,45,44,42,41,39,38,37,36,35

```
3,2,2,3,2,1,2,3,3,3,2,3,2,1
2,1,3,1,3,2,3,3,1,1,3,3,3,1
3,1,2,3,3,2,3,1,1,1,3,1,3,2
2,1,2,2,3,3,2,2,3,3,3,1,2,2
1,2,1,2,1,2,3,2,2,1,3,2,3,2
2,3,3,1,3,3,1,2,2,3,2,2,2,2
1,3,3,3,2,1,1,3,2,2,2,3,2,3
3,2,1,1,1,2,3,3,3,1,1,1,3,1
1,1,2,1,3,1,2,3,3,3,2,2,1,2
2,1,3,1,2,3,3,2,2,2,2,3,1,2
3,1,2,1,1,3,1,2,1,2,2,2,3,1
1,2,3,1,1,1,2,2,2,3,3,2,2,3
```

6.13.3 Submission Output

```
 1  32232123332321
 2  21313233113331
 3  31233231113132
 4  21223322333122
 5  12121232213232
 6  23313312232222
 7  13332113222323
 8  32111233311131
 9  11213123332212
10  21312332222312
11  31211312122231
12  12311122233223
13  ---------------
14  32211111112212
15  21111111222222
16  11111112222222
17  11111122222222
18  11111212222232
19  21111112222222
20  11112111222322
21  12222211122222
22  22222211112222
23  22222222222222
24  22222222322222
25  22222222233222
```

6.13.4 Solution Output

```
1  32232123332321
2  21313233113331
3  31233231113132
4  21223322333122
5  12121232213232
6  23313312232222
7  13332113222323
```

```
 8  32111233311131
 9  11213123332212
10  21312332222312
11  31211312122231
12  12311122233223
13  ---------------
14  32211111112212
15  21111111222222
16  11111112222222
17  11111122222222
18  11111212222232
19  21111112222222
20  11112111222322
21  12222211122222
22  22222211112222
23  22222222222222
24  22222222322222
25  22222222233222
```

6.13.5 `stderr`

6.14 part04test14

6.14.1 Diff

6.14.2 Input File

```
63,57
```

```
3,2,1,2,2,3,1,3,1,1,1,2,1
1,1,1,2,1,3,3,2,1,1,1,2,2
1,3,3,3,1,3,3,3,1,1,2,3,2
3,3,2,2,1,2,1,2,3,1,3,3,3
1,2,2,1,1,3,3,1,2,1,2,3,3
1,2,3,3,2,3,2,3,1,3,3,3,3
3,3,2,2,1,3,2,2,1,2,1,3,1
1,2,2,2,2,1,3,3,2,1,2,1,3
3,1,2,1,3,1,3,3,3,2,1,2,1
3,1,3,2,3,2,1,3,3,2,2,1,2
2,3,3,3,1,2,3,3,1,3,3,1,3
```

6.14.3 Submission Output

```
1  3212231311121
2  1112133211122
3  1333133311232
4  3322121231333
5  1221133121233
6  1233232313333
7  3322132212131
8  1222213321213
9  3121313332121
```

142

```
10  3132321332212
11  2333123313313
12  ---------------
13  3212231311121
14  1112133211122
15  1333133311232
16  3322121231333
17  1221133121233
18  1233232313333
19  3322132212131
20  1222213321213
21  3121313332121
22  3132321332222
23  2333123313322
```

6.14.4 Solution Output

```
1   3212231311121
2   1112133211122
3   1333133311232
4   3322121231333
5   1221133121233
6   1233232313333
7   3322132212131
8   1222213321213
9   3121313332121
10  3132321332212
11  2333123313313
12  ---------------
13  3212231311121
14  1112133211122
15  1333133311232
16  3322121231333
17  1221133121233
18  1233232313333
19  3322132212131
20  1222213321213
21  3121313332121
22  3132321332222
23  2333123313322
```

6.14.5 stderr

6.15   part04test15

6.15.1   Diff

6.15.2   Input File

```
20,19,7
```

```
2,2,1,1,1,2,1,2,1,2,2,1
```

```
1,1,1,2,1,2,2,1,1,2,1,1
2,2,1,2,2,1,2,1,2,1,1,2
1,1,1,1,1,2,2,2,1,2,2,2
1,1,2,1,2,2,1,2,1,2,2,2
2,1,2,1,2,1,1,2,1,2,1,1
2,1,2,1,2,2,2,1,1,2,2,1
2,2,2,2,1,1,2,1,1,1,2,1
2,2,1,1,1,1,1,2,2,2,1,2
2,2,2,1,1,1,1,1,1,2,2,2
```

6.15.3 Submission Output

part04test15.output

```
 1  221112121221
 2  111212211211
 3  221221212112
 4  111112221222
 5  112122121222
 6  212121121211
 7  212122211221
 8  222211211121
 9  221111122212
10  222111111222
11  ----------------
12  221112121111
13  111212211111
14  221221212112
15  111112221222
16  112122121222
17  212121121211
18  212122211221
19  222211211121
20  221111122212
21  222111111222
```

6.15.4 Solution Output

part04test15.solution

```
 1  221112121221
 2  111212211211
 3  221221212112
 4  111112221222
 5  112122121222
 6  212121121211
 7  212122211221
 8  222211211121
 9  221111122212
10  222111111222
11  ----------------
12  221112121111
13  111212211111
14  221221212112
15  111112221222
16  112122121222
17  212121121211
18  212122211221
19  222211211121
20  221111122212
21  222111111222
```

144

6.16 part04test16

6.16.1 Diff

part04test16.diff

6.16.2 Input File

part04test16.moves.bff

```
27,26,25,24,23,22,21,20,19,18,17,16,15,14,13,12,11,10,9,8,7,6,5,4,3,2
```

part04test16.game.bff

```
1,2,1,3,3,1
1,1,1,4,4,2
2,2,1,4,1,2
4,2,2,2,3,3
1,1,2,3,3,3
3,1,3,1,2,1
4,3,4,3,4,3
2,1,1,2,2,3
1,1,3,2,1,1
```

6.16.3 Submission Output

part04test16.output

```
 1  121331
 2  111442
 3  221412
 4  422233
 5  112333
 6  313121
 7  434343
 8  211223
 9  113211
10  ----------------
11  121114
12  111112
13  221112
14  422222
15  332222
16  433222
17  432222
18  222222
19  222222
```

6.16.4 Solution Output

part04test16.solution

```
1  121331
2  111442
3  221412
4  422233
5  112333
6  313121
```

145

```
 7  434343
 8  211223
 9  113211
10  ---------------
11  121114
12  111112
13  221112
14  422222
15  332222
16  433222
17  432222
18  222222
19  222222
```

6.16.5 stderr

6.17 part04test17

6.17.1 Diff

6.17.2 Input File

```
40,34,29,28,25,21,19,18,5
```

```
2,3,1,3,3,3,2,3
3,2,3,2,2,1,2,1
1,3,3,1,2,1,2,3
1,2,2,3,2,1,3,1
3,1,3,1,1,1,3,2
3,1,3,3,1,2,3,1
2,1,2,2,2,3,3,1
2,2,1,2,2,3,2,1
2,2,2,2,3,1,3,2
1,1,1,1,1,3,3,1
1,3,3,3,3,3,3,2
1,1,2,1,2,3,2,3
3,3,1,1,2,2,1,1
```

6.17.3 Submission Output

```
 1  23133323
 2  32322121
 3  13312123
 4  12232131
 5  31311132
 6  31331231
 7  21222331
 8  22122321
 9  22223132
10  11111331
11  13333332
12  11212323
```

146

```
13  33112211
14  ----------------
15  23133333
16  32322131
17  13312133
18  12232131
19  33311133
20  33331333
21  33333333
22  33133333
23  33333133
24  11111333
25  13333333
26  11212321
27  33112211
```

6.17.4 Solution Output

```
1   23133323
2   32322121
3   13312123
4   12232131
5   31311132
6   31331231
7   21222331
8   22122321
9   22223132
10  11111331
11  13333332
12  11212323
13  33112211
14  ----------------
15  23133333
16  32322131
17  13312133
18  12232131
19  33311133
20  33331333
21  33333333
22  33133333
23  33333133
24  11111333
25  13333333
26  11212321
27  33112211
```

6.17.5 stderr

6.18 part04test18

6.18.1 Diff

6.18.2 Input File

36,35,34,33,29,27,26,25,24,23,20,17,16,15,14,13,10,8,6,5,1

```
4,4,4,3,1,2
2,4,3,1,2,3
1,3,2,1,3,2
2,4,2,1,4,2
1,1,4,1,4,4
2,2,3,2,1,1
2,1,3,2,4,2
2,2,2,3,1,4
1,3,4,1,3,3
3,3,2,1,1,2
```

6.18.3 Submission Output

```
1   444312
2   243123
3   132132
4   242142
5   114144
6   223211
7   213242
8   222314
9   134133
10  332112
11  ----------------
12  111312
13  113123
14  132133
15  412143
16  114144
17  333311
18  333311
19  333333
20  134433
21  332444
```

6.18.4 Solution Output

```
1   444312
2   243123
3   132132
4   242142
5   114144
6   223211
7   213242
8   222314
9   134133
10  332112
11  ----------------
12  111312
13  113123
14  132133
15  412143
16  114144
```

```
17  333311
18  333311
19  333333
20  134433
21  332444
```

6.18.5 stderr

6.19   part04test19

6.19.1   Diff

6.19.2   Input File

```
58 ,57 ,55 ,45 ,41 ,38 ,26 ,25 ,22 ,20 ,13 ,9 ,7 ,5 ,1
```

```
2 ,2 ,1 ,3 ,1 ,3 ,4 ,1 ,4 ,1 ,3 ,3 ,4 ,3
3 ,1 ,1 ,4 ,4 ,1 ,1 ,4 ,1 ,2 ,4 ,3 ,4 ,1
1 ,4 ,1 ,3 ,1 ,1 ,3 ,2 ,4 ,1 ,1 ,4 ,2 ,1
2 ,4 ,4 ,1 ,4 ,4 ,3 ,1 ,3 ,3 ,1 ,2 ,3 ,2
4 ,1 ,3 ,4 ,4 ,3 ,2 ,3 ,2 ,3 ,2 ,2 ,1 ,3
2 ,3 ,2 ,3 ,1 ,4 ,3 ,1 ,4 ,4 ,1 ,3 ,1 ,2
```

6.19.3   Submission Output

```
1   22131341413343
2   31144114124341
3   14131132411421
4   24414431331232
5   41344323232213
6   23231431441312
7   ----------------
8   33131241443343
9   31144114124342
10  11131134311422
11  21114431331232
12  21344123232243
13  23231431331244
```

6.19.4   Solution Output

```
1   22131341413343
2   31144114124341
3   14131132411421
4   24414431331232
5   41344323232213
6   23231431441312
7   ----------------
8   33131241443343
9   31144114124342
10  11131134311422
```

```
11  21114431331232
12  21344123232243
13  23231431331244
```

6.19.5 stderr

6.20 part04test20

6.20.1 Diff

6.20.2 Input File

```
35,31
```

```
3,4,4,1,2,2,3,1
4,1,4,2,4,1,3,3
2,4,1,1,3,4,4,1
2,2,4,4,2,2,3,1
3,1,2,2,3,4,3,3
2,1,2,2,2,3,1,1
2,4,2,2,3,2,3,3
3,2,1,4,3,1,1,3
1,4,1,2,2,1,3,1
```

6.20.3 Submission Output

```
 1  34412231
 2  41424133
 3  24113441
 4  22442231
 5  31223433
 6  21222311
 7  24223233
 8  32143113
 9  14122131
10  ----------------
11  34412231
12  41424133
13  24113441
14  22442231
15  31223433
16  21222311
17  24223233
18  32143113
19  14122131
```

6.20.4 Solution Output

```
1  34412231
2  41424133
3  24113441
```

```
 4  22442231
 5  31223433
 6  21222311
 7  24223233
 8  32143113
 9  14122131
10  ---------------
11  34412231
12  41424133
13  24113441
14  22442231
15  31223433
16  21222311
17  24223233
18  32143113
19  14122131
```

6.20.5 `stderr`

6.21 part04test21

6.21.1 Diff

6.21.2 Input File

```
49,47,45,44,42,40,36,32,27,26,25,21,20,19,17,16,9,4
```

```
2,1,2,2,1,1,1,3,1,3,3,3,2,1
2,2,3,2,2,1,1,1,3,3,3,1,3,3
1,1,3,3,2,3,3,3,1,3,2,3,1,2
3,1,1,1,1,3,1,3,3,3,3,1,1,2
3,1,1,1,1,3,1,3,1,3,1,2,2,3
3,2,2,2,2,1,3,3,3,2,2,3,2,3
3,1,2,1,1,2,1,2,2,1,1,1,1,2
2,2,2,3,1,2,3,1,2,3,1,3,2,2
2,1,1,1,1,2,1,2,3,3,3,1,3,3
2,2,3,1,1,1,2,3,1,1,2,1,1,1
```

6.21.3 Submission Output

```
 1  21221113133321
 2  22322111333133
 3  11332333132312
 4  31111313333112
 5  31111313131223
 6  32222133322323
 7  31211212211112
 8  22231231231322
 9  21111212333133
10  22311123112111
11  ----------------
12  21223333133322
```

```
13  22322333333133
14  1133233312332
15  11111313333332
16  11111313331223
17  11111133333323
18  11111222211112
19  11111231231322
20  11111212333111
21  11311122111111
```

6.21.4 Solution Output

```
 1  21221113133321
 2  22322111333133
 3  11332333132312
 4  31111313333112
 5  31111313131223
 6  32222133322323
 7  31211212211112
 8  22231231231322
 9  21111212333133
10  22311123112111
11  ---------------
12  21223333133322
13  22322333333133
14  11332333132332
15  11111313333332
16  11111313331223
17  11111133333323
18  11111222211112
19  11111231231322
20  11111212333111
21  11311122111111
```

6.21.5 stderr

6.22 part04test22

6.22.1 Diff

6.22.2 Input File

```
18,14,10,3
```

```
3,2,3,2,1,2,2,3
2,2,2,1,2,2,3,1
1,3,3,3,2,1,1,3
2,2,1,2,2,2,2,2
1,2,2,1,1,1,1,1
2,2,1,1,1,1,3,1
2,1,3,3,1,2,1,3
```

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6.22.3 Submission Output

```
1  32321223
2  22212231
3  13332113
4  22122222
5  12211111
6  22111131
7  21331213
8  ----------------
9  32121223
10 22212233
11 13332112
12 22122222
13 12211111
14 22111131
15 21331213
```

6.22.4 Solution Output

part04test22.solution

```
1  32321223
2  22212231
3  13332113
4  22122222
5  12211111
6  22111131
7  21331213
8  ----------------
9  32121223
10 22212233
11 13332112
12 22122222
13 12211111
14 22111131
15 21331213
```

6.22.5 stderr

part04test22.err

6.23 part04test23

6.23.1 Diff

part04test23.diff

6.23.2 Input File

part04test23.moves.bff

```
31,29,28,27,23,21,19,18,17,16,14,13,11,10,7,5,1
```

part04test23.game.bff

```
3,1,3,3,2,1,3,2,2,2,3,2
2,2,3,2,1,1,3,3,3,2,1,3
2,3,1,2,1,1,2,2,2,1,1,2
1,3,3,3,1,2,1,1,1,1,2,1
```

```
1,2,3,1,3,2,1,3,3,3,1,1
1,2,2,3,1,1,1,3,2,2,3,2
1,2,3,1,1,3,3,3,3,2,2,1
```

6.23.3 Submission Output

```
1   313321322232
2   223211333213
3   231211222112
4   133312111121
5   123132133311
6   122311132232
7   123113333221
8   ----------------
9   213321333332
10  223111333313
11  231111222111
12  333311111123
13  323231133333
14  322311131132
15  323113333111
```

6.23.4 Solution Output

```
1   313321322232
2   223211333213
3   231211222112
4   133312111121
5   123132133311
6   122311132232
7   123113333221
8   ----------------
9   213321333332
10  223111333313
11  231111222111
12  333311111123
13  323231133333
14  322311131132
15  323113333111
```

6.23.5 stderr

6.24 part04test24

6.24.1 Diff

6.24.2 Input File

46,45,43,42,41,40,39,38,37,36,35,34,33,32,31,30,29,27,26,25,24,23,22,21,20,19,18,17,16,15,14
```

```
4,1,3,2,1,2,4,4,3,3,4
2,4,2,4,1,1,4,3,1,2,2
3,4,1,3,3,3,1,1,4,3,1
2,3,3,3,1,3,1,3,4,2,1
4,1,2,4,3,3,3,3,3,3,1
1,1,3,2,1,2,4,3,3,4,1
3,3,4,3,2,4,3,2,1,2,3
```

6.24.3 Submission Output

```
 1  41321244334
 2  24241143122
 3  34133311431
 4  23331313421
 5  41243333331
 6  11321243341
 7  33432432123
 8  ---------------
 9  11323244334
10  33343343333
11  33333333433
12  33333333433
13  34443333333
14  44323433333
15  44432333433
```

6.24.4 Solution Output

```
 1  41321244334
 2  24241143122
 3  34133311431
 4  23331313421
 5  41243333331
 6  11321243341
 7  33432432123
 8  ---------------
 9  11323244334
10  33343343333
11  33333333433
12  33333333433
13  34443333333
14  44323433333
15  44432333433
```

6.24.5 stderr

6.25 part04test25

6.25.1 Diff

6.25.2 Input File

78,76,74,72,70,68,65,63,62,61,58,56,53,52,51,50,48,47,46,45,44,43,41,40,37,36,34,32,31,30,27

```
3,3,1,3,2,3,2,2,3,3,3,3,3
1,3,1,3,2,2,3,2,2,2,3,1,3
2,2,3,3,1,1,3,1,2,2,1,2,2
2,1,2,1,1,3,3,3,3,3,1,2,2
1,3,2,1,2,2,1,2,2,3,3,1,3
3,1,1,1,1,3,2,3,2,1,3,3,3
2,2,3,2,1,2,1,2,3,3,1,3,3
3,2,3,2,3,1,3,3,1,3,2,1,1
3,2,1,3,2,3,1,2,2,2,2,1,2
2,1,1,2,2,2,2,3,3,3,2,3,2
2,3,3,1,2,1,2,2,2,2,3,3,2
2,1,3,3,2,1,1,1,2,1,3,2,1
1,3,2,2,2,3,2,1,2,1,2,3,1
3,1,3,1,2,1,3,2,2,1,2,3,2
2,1,2,2,3,1,3,1,3,3,3,1,1
```

6.25.3 Submission Output

```
 1  3313232233333
 2  1313223222313
 3  2233113122122
 4  2121133333122
 5  1321221223313
 6  3111132321333
 7  2232121233133
 8  3232313313211
 9  3213231222212
10  2112222333232
11  2331212222332
12  2133211121321
13  1322232121231
14  3131213221232
15  2122313133311
16  ---------------
17  2212221122222
18  2212222111222
19  2222222111222
20  2222222222222
21  2222221222222
22  2222222222222
23  2222222222222
24  1222222222211
25  1212222222212
26  1112222222222
27  1111212222222
28  1111211122221
29  1122222122211
30  1111222222211
31  2111122222211
```

6.25.4 Solution Output

```
 1  3313232233333
```

```
 2  1313223222313
 3  2233113122122
 4  2121133333122
 5  1321221223313
 6  3111132321333
 7  2232121233133
 8  3232313313211
 9  3213231222212
10  2112222333232
11  2331212222332
12  2133211121321
13  1322232121231
14  3131213221232
15  2122313133311
16  ---------------
17  2212221122222
18  2212222111222
19  2222222111222
20  2222222222222
21  2222221222222
22  2222222222222
23  2222222222222
24  1222222222211
25  1212222222212
26  1112222222222
27  1111212222222
28  1111211122221
29  1122222122211
30  1111222222211
31  2111122222211
```

6.25.5 stderr

6.26   part04test26

6.26.1   Diff

6.26.2   Input File

```
63,60,54,53,49,47,46,41,40,39,38,29,28,24,17,15,11
```

```
3,2,2,3,4,2,4,4,2,3,1,4,4
4,1,3,2,2,1,3,4,2,4,1,2,1
4,4,3,2,4,3,3,2,2,1,2,4,2
2,3,4,3,4,3,3,1,1,1,1,4,3
2,1,3,1,4,4,3,1,1,1,4,2,2
4,2,1,3,4,3,1,3,2,2,2,3,4
3,4,4,1,4,2,1,4,2,4,1,4,4
2,1,4,4,3,3,3,3,4,2,2,3,3
3,4,4,3,2,3,1,2,1,1,3,3,4
```

6.26.3   Submission Output

```
 1  3223424423144
 2  4132213424121
 3  4432433221242
 4  2343433111143
 5  2131443111422
 6  4213431322234
 7  3441421424144
 8  2144333342233
 9  3443231211334
10  ---------------
11  3223424423144
12  1132243423121
13  1132433221242
14  2341433111144
15  2131443111422
16  4213421422234
17  3332421124144
18  2333333342233
19  3333231211334
```

6.26.4 Solution Output

```
 1  3223424423144
 2  4132213424121
 3  4432433221242
 4  2343433111143
 5  2131443111422
 6  4213431322234
 7  3441421424144
 8  2144333342233
 9  3443231211334
10  ---------------
11  3223424423144
12  1132243423121
13  1132433221242
14  2341433111144
15  2131443111422
16  4213421422234
17  3332421124144
18  2333333342233
19  3333231211334
```

6.26.5 stderr

6.27 part04test27

6.27.1 Diff

6.27.2 Input File

```
9,6,3
```

```
1,2,1,2,1,1,2
1,2,2,2,2,1,1
2,2,1,1,1,2,2
2,2,1,2,2,2,2
2,2,1,2,2,2,2
2,1,2,2,1,2,1
1,2,2,2,2,2,2
```

6.27.3 Submission Output

```
1  1212112
2  1222211
3  2211122
4  2212222
5  2212222
6  2122121
7  1222222
8  ----------------
9  1212112
10 1222211
11 2222222
12 2222222
13 2222222
14 2122121
15 1222222
```

6.27.4 Solution Output

```
1  1212112
2  1222211
3  2211122
4  2212222
5  2212222
6  2122121
7  1222222
8  ----------------
9  1212112
10 1222211
11 2222222
12 2222222
13 2222222
14 2122121
15 1222222
```

6.27.5 stderr

6.28 part04test28

6.28.1 Diff

6.28.2 Input File

24,22,21,20,19,18,17,16,14,13,12,10,9,7,6,4,3,2

```
2,1,2,2,1,2,1,1
2,1,1,2,1,1,1,3
2,2,3,3,3,3,2,1
3,3,3,2,3,3,3,3
2,1,2,3,1,1,2,3
1,2,2,3,2,3,3,2
1,2,2,1,1,3,3,2
3,3,3,3,3,1,1,2
2,3,3,3,3,1,2,1
```

6.28.3 Submission Output

```
1   21221211
2   21121113
3   22333321
4   33323333
5   21231123
6   12232332
7   12211332
8   33333112
9   23333121
10  ----------------
11  23222222
12  23322223
13  22222223
14  22222222
15  22221122
16  22222222
17  22222222
18  22222222
19  22222221
```

6.28.4 Solution Output

```
1   21221211
2   21121113
3   22333321
4   33323333
5   21231123
6   12232332
7   12211332
8   33333112
9   23333121
10  ----------------
11  23222222
12  23322223
13  22222223
14  22222222
15  22221122
16  22222222
17  22222222
18  22222222
19  22222221
```

6.28.5 stderr

6.29   part04test29

6.29.1   Diff

6.29.2   Input File

```
20,19,18,17,16,15,13,12,11,10,9,8,7,6,5,4,3,1
```

```
3,1,2,2,1,2
1,2,3,2,2,2
3,1,1,3,2,3
3,2,1,2,1,2
1,2,3,2,1,1
1,3,3,3,2,1
1,3,1,1,3,1
```

6.29.3   Submission Output

```
 1  312212
 2  123222
 3  311323
 4  321212
 5  123211
 6  133321
 7  131131
 8  ---------------
 9  312212
10  322222
11  322223
12  322222
13  222222
14  222222
15  222222
```

6.29.4   Solution Output

```
 1  312212
 2  123222
 3  311323
 4  321212
 5  123211
 6  133321
 7  131131
 8  ---------------
 9  312212
10  322222
11  322223
12  322222
```

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```
13  222222
14  222222
15  222222
```

6.29.5 `stderr`

part04test29.err

6.30   part04test30

6.30.1   Diff

part04test30.diff

6.30.2   Input File

part04test30.moves.bff

```
57,54,52,50,49,47,45,44,43,42,41,39,38,37,36,35,33,29,27,26,25,23,21,20,19,18,16,15,14,13,8,
```

part04test30.game.bff

```
1,2,1,1,3,2,2,2,1,2
3,2,1,3,3,1,3,1,1,3
2,3,2,2,3,1,2,1,1,2
3,2,2,3,3,1,3,3,2,2
3,2,3,3,3,1,3,1,1,3
3,2,3,2,1,3,3,1,1,2
1,3,2,1,1,3,2,3,2,2
3,1,3,3,2,3,1,1,1,2
3,3,1,1,2,2,3,2,2,2
2,2,2,2,2,1,1,2,1,2
3,1,2,2,2,3,3,1,2,1
1,3,2,1,2,1,1,3,2,1
2,3,1,2,1,1,2,3,1,1
3,1,2,1,2,3,2,2,2,1
```

6.30.3   Submission Output

part04test30.output

```
 1  1211322212
 2  3213313113
 3  2322312112
 4  3223313322
 5  3233313113
 6  3232133112
 7  1321132322
 8  3133231112
 9  3311223222
10  2222211212
11  3122233121
12  1321211321
13  2312112311
14  3121232221
15  ---------------
16  2211111112
17  2211111113
18  2322111111
19  2221111111
20  2211111113
```

```
21  2212111111
22  1321111111
23  3333111111
24  3311111111
25  1111111111
26  1111111111
27  1111111111
28  2111111111
29  3111111111
```

6.30.4 Solution Output

```
 1  1211322212
 2  3213313113
 3  2322312112
 4  3223313322
 5  3233313113
 6  3232133112
 7  1321132322
 8  3133231112
 9  3311223222
10  2222211212
11  3122233121
12  1321211321
13  2312112311
14  3121232221
15  ----------------
16  2211111112
17  2211111113
18  2322111111
19  2221111111
20  2211111113
21  2212111111
22  1321111111
23  3333111111
24  3311111111
25  1111111111
26  1111111111
27  1111111111
28  2111111111
29  3111111111
```

6.30.5 `stderr`

6.31 Source Code

```
1  module.exports = {
2      manyPlayersManyMoves: manyPlayersManyMoves
3  }
4
5  var helpers = require( './helpers' );
6
7  function manyPlayersManyMoves( game ){
8
9      function whatever( moves ){
```

```
10                    var playersTurn = 1;
11                    for(var i = 0; i < moves.length; i++){
12                    var clusters = [];
13                    var clusterCounter = 1;
14                    var numberOfMatches = 0;
15                    var lengthOfRow = game.length;
16                    var lengthOfColumn = game[0].length;
17                    var copy = [];
18                    var players = 0;
19
20                    // Initialize first row
21                    clusters[0] = [];
22                    clusters[0][0] = 1;
23                    copy[0] = [];
24                    copy[0][0] = 1;
25
26                    for(var row = 1; row < lengthOfColumn; row++ ){
27                            if(game[0][row] == game[0][row-1]){
28                                    clusters[0][row] = clusterCounter;
29                                    copy[0][row] = clusterCounter;
30                            }
31
32                            else{
33                                    clusterCounter++;
34                                    clusters[0][row] = clusterCounter;
35                                    copy[0][row] = clusterCounter;
36                            }
37                    }
38
39                    // Take care of every other row
40                    for(var r = 1; r < lengthOfRow; r++){
41                            clusters[r] = [];
42                            copy[r] = [];
43
44                            for(var c = 0; c < lengthOfColumn; c++){
45                                    if(game[r][c] > players){
46                                            players = game[r][c]
47                                    }
48
49                                    if(c == 0){
50                                            clusterCounter++;
51                                            clusters[r][c] = clusterCounter;
52                                            copy[r][c] = clusterCounter;
53                                    }
54                                    else if(game[r][c] == game[r][c-1]){
55                                            clusters[r][c] = clusterCounter;
56                                            copy[r][c] = clusterCounter;
57                                    }
58
59                                    else{
60                                            clusterCounter++;
61                                            clusters[r][c] = clusterCounter;
62                                            copy[r][c] = clusterCounter;
63                                    }
64                            }
65                    }
66
67                    // Combine clusters with the same value
68                    for(var ro = 1; ro < lengthOfRow; ro++){
69                            for(var co = 0; co < lengthOfColumn; co++){
```

```
70                                              if(game[ro][co] == game[ro-1][co]){
71                                                  var valueToMatch = clusters[ro][co];
72                                                  var valueToTurn = clusters[ro-1][co];
73
74                                                  for(var newRo = 0; newRo < lengthOfRow; newRo
    ++){
75                                                      for(var newCo = 0; newCo <
    lengthOfColumn; newCo++){
76                                                          if(clusters[newRo][newCo] ==
    valueToMatch){
77                                                              clusters[newRo][newCo]
     = valueToTurn;
78                                                          }
79                                                      }
80                                                  }
81
82                                              }
83                                          }
84                                      }
85
86                      var newClusterCounter = 1;
87
88                      // Reduce cluster values
89                      for(var row = 0; row < lengthOfRow; row++){
90                          for(var col = 0; col < lengthOfColumn; col++){
91                              if(copy[row][col] != null){
92                                  var searchValue = clusters[row][col];
93                                  copy[row][col] = null;
94
95                                  for(var r = 0; r < lengthOfRow; r++){
96                                      for(var c = 0; c < lengthOfColumn; c
    ++){
97                                          if(clusters[r][c] ==
    searchValue){
98                                              clusters[r][c] =
    newClusterCounter;
99                                              copy[r][c] = null;
100                                         }
101                                     }
102                                 }
103
104                                 newClusterCounter++;
105                             }
106                         }
107                     }
108
109
110
111                     // Find the move to make and change the cluster
112                     for(var row = 0; row < lengthOfRow; row++){
113                         for(var col = 0; col < lengthOfColumn; col++){
114
115                             if(clusters[row][col] == moves[i]){
116                                 game[row][col] = playersTurn;
117                             }
118                         }
119                     }
120
121                     var win = true;
122
```

```
123                         for(var row = 0; row < lengthOfRow; row++){
124                             for(var col = 0; col < lengthOfColumn; col++){
125                                 if(game[0][0] != game[row][col]){
126                                     win = false;
127                                 }
128                             }
129                         }
130
131                     if(win == true){
132                         return game;
133                     }
134
135                     if(playersTurn == players){
136                         playersTurn = 1;
137                     }
138                     else{
139                         playersTurn++;
140                     }
141
142                 }
143                 return game;
144         }
145
146     return whatever;
147 }
```

Chapter 7

helpers.js

7.1 Source Code

```
 1  module.exports = {
 2      readGameFile:readGameFile,
 3      readMovesFile:readMovesFile,
 4      printGame:printGame,
 5      printMoves:printMoves
 6  }
 7
 8  function readGameFile( file )
 9  {
10      var text;
11      var lines = [];
12      var rows = [];
13      var filesystem = require( 'fs' );
14
15      text = filesystem.readFileSync( file );
16      rows = text.toString().split( "\n" );
17      rows.pop();
18
19      var game = [];
20      for( var r = 0; r < rows.length; r++ ){
21          rows[r] = rows[r].split( "," );
22          game[r] = [];
23          for( var c = 0; c < rows[r].length; c++ ){
24              game[r][c] = rows[r][c];
25          }
26      }
27
28      return game;
29  }
30
31  function readMovesFile( file )
32  {
33      var text;
34      var line = [];
35      var filesystem = require( 'fs' );
36      var row = [];
37      var moves = [];
38
39      text = filesystem.readFileSync( file );
40      moves = text.toString().split( "\n" );
41      moves = moves[0];
```

```
42      moves = moves.split( "," );
43      for( var m = 0; m < moves.length; m++ ){
44          moves[m] = parseInt( moves[m] );
45      }
46      return moves;
47  }
48
49  function printGame(game){
50      for( var r = 0; r < game.length; r++ ){
51          var row = "";
52          for( var c = 0; c < game[r].length; c++ ){
53              row = row + game[r][c];
54          }
55          console.log( row );
56      }
57  }
58
59  function printMoves(spaces){
60      var moveString = "";
61      for( var m = 0; m < moves.length; m++ ){
62          moveString = moveString + moves[m];
63      }
64      console.log( moveString );
65  }
```