

# Chapter 1

## Rubric

Component	Points
<code>csce322hw03pt01.hs</code>	
Test Cases	$30 \times 1$
Compilation	10
Total	40
<code>csce322hw03pt02.hs</code>	
Test Cases	$10 \times 1$
Compilation	10
Total	20
<code>csce322hw03pt03.hs</code>	
Test Cases	$30 \times 1$
Compilation	10
Total	40
Total	100%

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# Chapter 2

## Metadata

### 2.1 Submitted Files

				handin.time	
1	03/24/2021	10:40:38	tgao: csce322hw03pt01.hs	-	OK
2	03/24/2021	10:42:19	tgao: csce322hw03pt02.hs	-	OK
3	03/24/2021	10:42:24	tgao: csce322hw03pt03.hs	-	OK
4	03/24/2021	10:42:29	tgao: Helpers.hs	-	OK
5	04/04/2021	19:05:50	tgao: Helpers.hs	-	OK
6	04/04/2021	22:36:34	tgao: Helpers.hs	-	OK
7	04/04/2021	22:36:40	tgao: csce322hw03pt01.hs	-	OK
8	04/07/2021	18:38:27	tgao: Helpers.hs	-	OK
9	04/07/2021	18:38:54	tgao: csce322hw03pt01.hs	-	OK
10	04/07/2021	18:41:05	tgao: csce322hw03pt01.hs	-	OK
11	04/07/2021	18:43:01	tgao: csce322hw03pt01.hs	-	OK
12	04/07/2021	23:49:43	tgao: Helpers.hs	-	OK
13	04/08/2021	00:23:35	tgao: Helpers.hs	-	OK
14	04/08/2021	14:43:27	tgao: Helpers.hs	-	OK
15	04/08/2021	14:43:33	tgao: csce322hw03pt01.hs	-	OK
16	04/08/2021	14:45:59	tgao: csce322hw03pt01.hs	-	OK
17	04/09/2021	01:02:22	tgao: Helpers.hs	-	OK
18	04/09/2021	01:02:43	tgao: csce322hw03pt01.hs	-	OK
19	04/09/2021	10:01:22	tgao: Helpers.hs	-	OK
20	04/09/2021	10:21:36	tgao: Helpers.hs	-	OK
21	04/09/2021	10:45:46	tgao: Helpers.hs	-	OK
22	04/10/2021	02:17:50	tgao: csce322hw03pt02.hs	-	1 day late
23	04/10/2021	02:23:36	tgao: Helpers.hs	-	1 day late
24	04/10/2021	22:26:27	tgao: Helpers.hs	-	1 day late
25	04/10/2021	22:26:34	tgao: csce322hw03pt03.hs	-	1 day late

### 2.2 webgrader Runs

	webgrader.time
1	2021-03-24T10:42:42-0500 (session=5s6gjstil05uvdrbplthb555p1qcrsurgttb3rr9a18a10qdo7g0, ip=216.171.62.23) GRADE SUBMISSION: tgao 0003
2	2021-03-27T23:33:50-0500 (session=vdfhpm1uvig98187gh3rt7q6sm7tmnsnm170brrgg2pbj25okqf0, ip=216.171.62.36) GRADE SUBMISSION: tgao 0003
3	2021-03-27T23:34:14-0500 (session=vdfhpm1uvig98187gh3rt7q6sm7tmnsnm170brrgg2pbj25okqf0, ip=216.171.62.36) GRADE SUBMISSION: tgao 0003
4	2021-04-07T18:39:14-0500 (session=jk23357jhu8rebkiadi4jqcm5tha354e8upo896rgf87f5b38v0, ip=216.171.62.28) GRADE SUBMISSION: tgao 0003
5	2021-04-07T18:41:13-0500 (session=jk23357jhu8rebkiadi4jqcm5tha354e8upo896rgf87f5b38v0, ip=216.171.62.28) GRADE SUBMISSION: tgao 0003
6	2021-04-07T18:43:17-0500 (session=jk23357jhu8rebkiadi4jqcm5tha354e8upo896rgf87f5b38v0, ip=216.171.62.28) GRADE SUBMISSION: tgao 0003

```

7 2021-04-07T23:50:12-0500 (session=jk23357jhu8rebkigiad4jqcm5tha354e8upo896rgf87f5b38v0
, ip=216.171.62.28) GRADE SUBMISSION: tgao 0003
8 2021-04-08T00:23:45-0500 (session=jk23357jhu8rebkigiad4jqcm5tha354e8upo896rgf87f5b38v0
, ip=216.171.62.28) GRADE SUBMISSION: tgao 0003
9 2021-04-08T14:44:18-0500 (session=jk23357jhu8rebkigiad4jqcm5tha354e8upo896rgf87f5b38v0
, ip=216.171.62.28) GRADE SUBMISSION: tgao 0003
10 2021-04-08T14:46:10-0500 (session=jk23357jhu8rebkigiad4jqcm5tha354e8upo896rgf87f5b38v0
, ip=216.171.62.28) GRADE SUBMISSION: tgao 0003
11 2021-04-09T01:03:11-0500 (session=jk23357jhu8rebkigiad4jqcm5tha354e8upo896rgf87f5b38v0
, ip=216.171.62.28) GRADE SUBMISSION: tgao 0003
12 2021-04-09T10:01:33-0500 (session=jk23357jhu8rebkigiad4jqcm5tha354e8upo896rgf87f5b38v0
, ip=216.171.62.28) GRADE SUBMISSION: tgao 0003
13 2021-04-09T10:21:55-0500 (session=jk23357jhu8rebkigiad4jqcm5tha354e8upo896rgf87f5b38v0
, ip=216.171.62.28) GRADE SUBMISSION: tgao 0003
14 2021-04-09T10:46:12-0500 (session=jk23357jhu8rebkigiad4jqcm5tha354e8upo896rgf87f5b38v0
, ip=216.171.62.28) GRADE SUBMISSION: tgao 0003
15 2021-04-10T02:18:35-0500 (session=jk23357jhu8rebkigiad4jqcm5tha354e8upo896rgf87f5b38v0
, ip=216.171.62.28) GRADE SUBMISSION: tgao 0003
16 2021-04-10T02:24:15-0500 (session=jk23357jhu8rebkigiad4jqcm5tha354e8upo896rgf87f5b38v0
, ip=216.171.62.28) GRADE SUBMISSION: tgao 0003
17 2021-04-10T22:27:06-0500 (session=fd95h8etah4jvtfefpgq68bnpub1cgvjdm09ebmp0tev7hje0vr1
, ip=216.171.62.27) GRADE SUBMISSION: tgao 0003

```

## 2.3 diffs

submission.diffs

```

1 csce322hw03/tgao/03/part03test02.diff
2 csce322hw03/tgao/03/part03test03.diff
3 csce322hw03/tgao/03/part03test08.diff
4 csce322hw03/tgao/03/part03test13.diff
5 csce322hw03/tgao/03/part03test15.diff
6 csce322hw03/tgao/03/part03test16.diff
7 csce322hw03/tgao/03/part03test17.diff
8 csce322hw03/tgao/03/part03test18.diff
9 csce322hw03/tgao/03/part03test19.diff
10 csce322hw03/tgao/03/part03test20.diff
11 csce322hw03/tgao/03/part03test23.diff
12 csce322hw03/tgao/03/part03test24.diff
13 csce322hw03/tgao/03/part03test25.diff
14 csce322hw03/tgao/03/part03test27.diff
15 csce322hw03/tgao/03/part03test28.diff
16 csce322hw03/tgao/03/part03test29.diff
17 csce322hw03/tgao/03/part03test30.diff

```

# Chapter 3

## csce322hw03pt01.hs

### 3.1 part01test01

#### 3.1.1 Diff

part01test01.diff

#### 3.1.2 Input File

part01test01.g

```
(
[
"xxxxxxxxxxxxxxxxxxxxxx",
"xx--x-x-----xx",
"x-----x-----x",
"x-----x-x-----x",
"x-----x-----x",
"x-----x-----x",
"x-----g-----x",
"x-x-x-----xx",
"x-----1--x",
"x-----x-----x",
"x-x-----xx--x",
"x--x-----x-----x",
"xxxxxxxxxxxxxxxxxxxxxx"
],
[
"180",
"c",
"180"
]
)
```

#### 3.1.3 Submission Output

part01test01.output

```
"Result "
"xxxxxxxxxxxxxxxxxxxxxx"
"x-----x-----x"
"x---xx-----x-x"
"x-----x-----x"
"x-----x-----x"
"xx-----x-x-x"
"x-----g-----x"
"x-----x-----x"
"x-----x-x-----x"
```

```
"x-----x-----x"
"xx-1-----x-x--xx"
"xxxxxxxxxxxxxxxxxxxx"
"
```

### 3.1.4 Solution Output

part01test01.output

```
"Result"
"xxxxxxxxxxxxxxxxxxxx"
"x-----x-----x--x"
"x---xx-----x-x"
"x-----x-----x"
"x-----x-----x"
"xx-----x-x-x"
"x-----g-----x"
"x-----x-----x"
"x-----x-x-----x"
"x-----x-----x"
"xx-1-----x-x--xx"
"xxxxxxxxxxxxxxxxxxxx"
"
```

### 3.1.5 stderr

part01test01.err

## 3.2 part01test02

### 3.2.1 Diff

part01test02.diff

### 3.2.2 Input File

part01test02.g

```
(
[
"xxxxxxxxxxxxxxxx",
"x-xx----xxx",
"x-----x--xx",
"x-x-----x",
"x-----xx--x",
"x-x-----x-xx",
"x-----x-x",
"x---x--g--x",
"x-----x-x",
"x-----x-----x",
"x-x-----x",
"x-----x",
"x----1----x",
"x-----xx-xx",
"x-----x--x",
"x--xx---xxx",
"xxxxxxxxxxxxxxxx",
],
[
"cc",
"cc",

```

```
"180",
"cc",
"180"
]
)
```

### 3.2.3 Submission Output

part01test02.output

```
"Result "
"xxxxxxxxxxxxxxxxxxxxx"
"xxx--x-----x-xx"
"xx----x-x-----xx"
"x---xx-g-----xx-x"
"x-x-x-----x--x"
"x-----x-----x"
"x-----x-----xx"
"xx-----xx"
"xx-x-x-----x"
"x-----1---x"
"xxxxxxxxxxxxxxxxxxxxx"
"
```

### 3.2.4 Solution Output

part01test02.output

```
"Result "
"xxxxxxxxxxxxxxxxxxxxx"
"xxx--x-----x-xx"
"xx----x-x-----xx"
"x---xx-g-----xx-x"
"x-x-x-----x--x"
"x-----x-----x"
"x-----x-----xx"
"xx-----xx"
"xx-x-x-----x"
"x-----1---x"
"xxxxxxxxxxxxxxxxxxxxx"
"
```

### 3.2.5 stderr

part01test02.err

## 3.3 part01test03

### 3.3.1 Diff

part01test03.diff

### 3.3.2 Input File

part01test03.g

```
(
[
"xxxxxxxxxxxxxxxxxxxxx",
"x-----x-x-----x",
"x-----x",
"x-----x",

```

```

"xx-----x",
"x--x-----x-x-x",
"x-----x-g----1----x",
"x-----xx-x-x",
"x-----x-xx----x-x",
"x-----x-----x",
"x--x-x-----x-x-x",
"x-----x-----xx",
"x-----x-----x",
"xxxxxxxxxxxxxxxxxxxxxx"
],
[
"cc",
"180",
"cc",
"c",
"cc",
"c",
"c",
"180"
]
)

```

### 3.3.3 Submission Output

part01test03.output

```

"Result "
"xxxxxxxxxxxxxxxxxxxxxx"
"x-----x-x"
"x-----xx----x"
"x-----x-----x"
"x-----x--x--x"
"x-----x-x-----x"
"x--x-----x--x"
"x-----x----x"
"xx-----x---xx"
"x-----x-x"
"xx----1-x----x"
"x-----x"
"x-----x--xx--x"
"x-----x"
"x-----x--x"
"x-----x-----x"
"x-----x-----x"
"x--x-----x"
"xxxxxxxxxxxxxxxxxxxxxx"
"

```

### 3.3.4 Solution Output

part01test03.output

```

"Result "
"xxxxxxxxxxxxxxxxxxxxxx"
"x-----x-x"
"x-----xx----x"
"x-----x-----x"
"x-----x--x--x"
"x-----x-x-----x"
"x--x-----x--x"
"x-----x----x"

```

```

"xx-----x---xx"
"x-----x-x"
"xx----1-x----x"
"x-----x"
"x-----x--xx--x"
"x-----x"
"x-----x--x"
"x----x-----x"
"x-----x"
"x---x-----x"
"xxxxxxxxxxxxxxxx"
" "

```

### 3.3.5 stderr

part01test03.err

## 3.4 part01test04

### 3.4.1 Diff

part01test04.diff

### 3.4.2 Input File

part01test04.g

```

(
[
"xxxxxxxxxxxxxxxx",
"x---xx--x--x-x",
"xx---x--x----x",
"x-----1----xx",
"x---xx-----x",
"x----x-----x",
"xxx-----x",
"x--x--x----x-x",
"x---x---x--x-x",
"x-x-----x",
"x---x-----x",
"x--xx---x----x",
"x-----x",
"xx-----x--x",
"x-g-----x----x",
"xx-----x-x-x",
"x---x-----xx",
"xxxxxxxxxxxxxxxx"
],
[
"c",
"180",
"180",
"180",
"180",
"cc",
"180",
"c",
"c",
"c",
"cc",

```



```
"cc",
"cc"
]
)
```

### 3.4.3 Submission Output

part01test04.output

```
"Result "
"xxxxxxxxxxxxxxxxxxxxxx"
"x-x-x-----x---x-x"
"x--g-----x--x-----x"
"x-----x---x-----x"
"xx-----xx-x---x--xx"
"x-----xx-xxx"
"x-----x-----x"
"x-----x-----x"
"x--x--x--x-----xxx"
"x-x-----x-----x"
"x--x-----x-----x"
"x-x-----xx---1-xx"
"xx-----x--x"
"xxxxxxxxxxxxxxxxxxxxxx"
"
```

### 3.4.4 Solution Output

part01test04.output

```
"Result "
"xxxxxxxxxxxxxxxxxxxxxx"
"x-x-x-----x---x-x"
"x--g-----x--x-----x"
"x-----x---x-----x"
"xx-----xx-x---x--xx"
"x-----xx-xxx"
"x-----x-----x"
"x-----x-----x"
"x--x--x--x-----xxx"
"x-x-----x-----x"
"x--x-----x-----x"
"x-x-----xx---1-xx"
"xx-----x--x"
"xxxxxxxxxxxxxxxxxxxxxx"
"
```

### 3.4.5 stderr

part01test04.err

## 3.5 part01test05

### 3.5.1 Diff

part01test05.diff

### 3.5.2 Input File

part01test05.g

```
(
```

```
[
"xxxxxxxxxxxxxxxxxxxxx",
"x--x----xx--xx---x",
"x-----x",
"x--x-----x--x--x",
"xx---x-----xx",
"x-----x-----1x",
"x-----x-----x-x",
"x--x-----x-----x-x",
"x-----xx",
"x-----xx-----x--x",
"x-----g---x",
"x-----x--x-----x",
"x--x-----x",
"xxxxxxxxxxxxxxxxxxxxx"
],
[
"c",
"c",
"cc",
"180",
"cc",
"cc"
]
)
```

### 3.5.3 Submission Output

part01test05.output

```
"Result "
"xxxxxxxxxxxxxxxxxxxxx"
"x-----x---x"
"x-----x"
"xx---x---x-xx"
"x-----x"
"x-----x"
"x--x---x---x"
"x--x-----x"
"x-x---x---xx"
"x-----x---xx"
"x-----x---x"
"x-x-----x--x"
"x--x-----xx"
"x--g-----xx"
"x-----x--x"
"x-----xx-----x"
"x---x--1x---x"
"xxxxxxxxxxxxxxxxxxxxx"
"
```

### 3.5.4 Solution Output

part01test05.output

```
"Result "
"xxxxxxxxxxxxxxxxxxxxx"
"x-----x---x"
"x-----x"
"xx---x---x-xx"
"x-----x"
"x-----x"
```

```

"x---x---x---x"
"x---x-----x"
"x-x---x---xx"
"x-----x---xx"
"x-----x---x"
"x-x-----x--x"
"x---x-----xx"
"x--g-----xx"
"x-----x--x"
"x-----xx-----x"
"x-----x--1x---x"
"xxxxxxxxxxxxxxxx"
" "

```

### 3.5.5 stderr

part01test05.err

## 3.6 part01test06

### 3.6.1 Diff

part01test06.diff

### 3.6.2 Input File

part01test06.g

```

(
[
"xxxxxxxxxxxxxxxxxxxx",
"x-x--x---x-----x",
"x---x---xx-x-----x",
"xx-----1x--x--x",
"x--x---x-----xx",
"x---x--x---x--xx",
"x---xxx---x---x",
"x-----x--x-xx",
"x--x---x-xxx--x",
"x-----x-----x",
"x-xg---xx-----x",
"x-----x",
"x-----x---xx--x",
"x---x-----x",
"x---x---x-x-x-x-x",
"x---xxx--x-----x",
"x-----x",
"x---x-----x",
"xxxxxxxxxxxxxxxxxxxx",
],
[
"c",
"180",
"cc",
"c",
"180",
"180",
"180",
"cc",
"cc",

```

```

"cc",
"180",
"c",
"cc",
"cc",
"c",
"cc",
"c",
"180",
"c",
"180"
]
)

```

### 3.6.3 Submission Output

part01test06.output

```

"Result "
"xxxxxxxxxxxxxxxxxxxxxx"
"x-----x--x"
"x-----x-----xx"
"x-----g-x--x--x"
"x--xxx-----x-x"
"xx-x-----xx---xx"
"x--x--x-----x-----x"
"x-----x--x-----x"
"x--x--x--x---xx-x-x"
"x--x--x--x-x---1xxx"
"x--x-----x---x--x"
"x-----x-----x-x"
"x--x-x--x--x-xx---x"
"x-----x---xx---x--x"
"x--x-----x-----x"
"x-----x-xx---x"
"xxxxxxxxxxxxxxxxxxxxxx"
""

```

### 3.6.4 Solution Output

part01test06.output

```

"Result "
"xxxxxxxxxxxxxxxxxxxxxx"
"x-----x--x"
"x-----x-----xx"
"x-----g-x--x--x"
"x--xxx-----x-x"
"xx-x-----xx---xx"
"x--x--x-----x-----x"
"x-----x--x-----x"
"x--x--x--x---xx-x-x"
"x--x--x--x-x---1xxx"
"x--x-----x---x--x"
"x-----x-----x-x"
"x--x-x--x--x-xx---x"
"x-----x---xx---x--x"
"x--x-----x-----x"
"x-----x-xx---x"
"xxxxxxxxxxxxxxxxxxxxxx"
""

```

### 3.6.5 stderr

part01test06.err

## 3.7 part01test07

### 3.7.1 Diff

part01test07.diff

### 3.7.2 Input File

part01test07.g

```
(  
[  
"xxxxxxxxxxxxx",  
"x--x---xg-x",  
"x---x-----x",  
"x-----x",  
"x-----x--x",  
"x---x---1x",  
"x-xx-----x",  
"x-x-----x",  
"x-----xx-xx",  
"xxxxxxxxxxxxx",  
],  
[  
"cc",  
"c",  
"180",  
"cc",  
"cc",  
"cc",  
"c",  
"180"  
]  
)
```

### 3.7.3 Submission Output

part01test07.output

```
"Result "  
"xxxxxxxxxxxxx "  
"x-----xx "  
"xg-----x "  
"xx--x---xx "  
"x---1---xx "  
"x---x---x "  
"x-x-----x "  
"xx---x--x "  
"x-----xx-x "  
"x-----x "  
"xxxxxxxxxxxxx "  
"
```

### 3.7.4 Solution Output

part01test07.output

```
"Result "
```

```

"xxxxxxxxxxxx"
"x-----xx"
"xg-----x"
"xx--x---xx"
"x----1---xx"
"x----x---x"
"x-x-----x"
"xx-----x--x"
"x-----xx-x"
"x-----x"
"xxxxxxxxxxxx"
" "

```

### 3.7.5 stderr

part01test07.err

## 3.8 part01test08

### 3.8.1 Diff

part01test08.diff

### 3.8.2 Input File

part01test08.g

```

(
[
"xxxxxxxxxxxx",
"x-x---x--x",
"x-----xx",
"x-----x",
"x--x-----x",
"x-----x",
"x-x-g-1--x",
"x-----x",
"x-----x",
"xx--xx--xx",
"x-----x",
"xxxxxxxxxxxx"
],
[
"cc",
"180",
"180"
]
)

```

### 3.8.3 Submission Output

part01test08.output

```

"Result"
"xxxxxxxxxxxx"
"x-x-----x-x"
"x-----x"
"xx-----x"
"x-----x-x"
"x----1---x-x"
"x--x-----x"

```

```
"xx-----x-----x"
"x-----x-x"
"xxxxxxxxxxxxxx"
"
```

### 3.8.4 Solution Output

part01test08.output

```
"Result"
"xxxxxxxxxxxxxx"
"x-x-----x-x"
"x-----x"
"xx-----x"
"x-----x-x"
"x-----1--x-x"
"x--x-----x"
"xx--x--x"
"x-----x-x"
"xxxxxxxxxxxxxx"
"
```

### 3.8.5 stderr

part01test08.err

## 3.9 part01test09

### 3.9.1 Diff

part01test09.diff

### 3.9.2 Input File

part01test09.g

```
(
[
"xxxxxxxxxxxxxxxxxxxxxxxx",
"x--x-----x-----x",
"xx-x---xx---x-----x",
"x-----xx-----x-x",
"x-----xx--x",
"xx--x--x--x-x1-----x",
"x-----x-----x",
"x-----x",
"x-----x",
"x-----xx-----xx",
"x-----x-----x",
"x---x-----xx-----x",
"x--x-----xx-g-----x",
"xxxxxxxxxxxxxxxxxxxxxxxx",
],
[
"cc",
"180",
"c",
"180",
"c",
"c",
"cc",

```

```
"c",
"180",
"180",
"c",
"180",
"cc"
]
)
```

### 3.9.3 Submission Output

part01test09.output

```
"Result "
"xxxxxxxxxxxxxxxxxx"
"x-----x---x"
"x--x-----x"
"x---x-----x"
"x---x-----x"
"x---x-----x"
"x---1-----gx"
"x-x--x-----x"
"x-----x-x"
"x---x---x-xxx"
"x--x--x--x--xx"
"xx-x-----x"
"x-x--x-----x"
"x-x-----x"
"x-----x--x"
"x---x-----x"
"x-----x-x"
"xxx-----xx"
"x-----x"
"x-x--x-----x"
"xxxxxxxxxxxxxxxxxx"
"
```

### 3.9.4 Solution Output

part01test09.output

```
"Result "
"xxxxxxxxxxxxxxxxxx"
"x-----x---x"
"x--x-----x"
"x---x-----x"
"x---x-----x"
"x---1-----gx"
"x-x--x-----x"
"x-----x-x"
"x---x---x-xxx"
"x--x--x--x--xx"
"xx-x-----x"
"x-x--x-----x"
"x-x-----x"
"x-----x--x"
"x---x-----x"
"x-----x-x"
"xxx-----xx"
"x-----x"
"x-x--x-----x"
"xxxxxxxxxxxxxxxxxx"
"
```



### 3.9.5 stderr

part01test09.err

## 3.10 part01test10

### 3.10.1 Diff

part01test10.diff

### 3.10.2 Input File

part01test10.g

```
(
[
"xxxxxxxxxxxxxxxxxxxx",
"x-----x-----x",
"x--x-x---x-----xx",
"x-----x-----g--x",
"x-----x-----x",
"x--x-----x--x--xx",
"x-----x-----xx",
"x-----xx",
"x-x--x-----xx",
"xx-----x---1---x",
"x--x---x-----x",
"xx-----x-----x",
"x-----x-x-x-x",
"x-xx-x-----x",
"xxx-x-----x",
"x-----x",
"x-----x---x",
"x--x-----x--xx",
"xxxxxxxxxxxxxxxxxxxx",
],
[
"180",
"cc",
"180",
"c",
"180",
"c",
"cc",
"180",
"180",
"c",
"c",
"c",
"180",
"cc",
"cc",
]
)
```

### 3.10.3 Submission Output

part01test10.output

```
"Result "
"xxxxxxxxxxxxxxxxxxxx"
```

```

"xx--x-----x---x"
"x----x-----x"
"x-----x"
"x-----x-xxx"
"x-----x-xx-x"
"x-x-x-x-----x"
"x-----x-----xx"
"x-----x----x--x"
"x-----x-----xx"
"xx-----x--x-x"
"xx-----x"
"xx--1-----x-----x"
"xx--x--x-----x--x"
"x-----x-----x"
"x--g-----x-----x"
"xx-----x--x-x--x"
"x-----x-----x"
"xxxxxxxxxxxxxxxxxxxx"
"

```

### 3.10.4 Solution Output

part01test10.output

```

"Result"
"xxxxxxxxxxxxxxxxxxxx"
"xx--x-----x---x"
"x----x-----x"
"x-----x"
"x-----x-xxx"
"x-----x-xx-x"
"x-x-x-x-----x"
"x-----x-----xx"
"x-----x----x--x"
"x-----x-----xx"
"xx-----x--x-x"
"xx-----x"
"xx--1-----x-----x"
"xx--x--x-----x--x"
"x-----x-----x"
"x--g-----x-----x"
"xx-----x--x-x--x"
"x-----x-----x"
"xxxxxxxxxxxxxxxxxxxx"
"

```

### 3.10.5 stderr

part01test10.err

## 3.11 part01test11

### 3.11.1 Diff

part01test11.diff

### 3.11.2 Input File

part01test11.g

(

```
[
"xxxxxxxxxxxxxxxxx",
"x-----x",
"x--x---x-----x",
"x-x-----x-----x",
"x----x---x---x",
"x---x-----x-x",
"x--x---x---x-x",
"x-----x--x-x",
"x-gx--x---x-x",
"x---x-x-----1x",
"x-----x-----x",
"xxxxxxxxxxxxxxxxx"
],
[
"180",
"cc",
"cc",
"180",
"c",
"180",
"cc",
"180",
"cc",
"cc",
"180",
"180",
"cc",
"cc",
"180"
]
)
```

### 3.11.3 Submission Output

part01test11.output

```
"Result "
"xxxxxxxxxxxxxxxxx"
"x-----x-----x"
"x-----x-x---x"
"x-x-----x--xg-x"
"x-x--x-----x"
"x-x---x---x---x"
"x-x-----x---x"
"x---x---x---x"
"x-----x-----x-x"
"x-----x---x---x"
"x1-----x"
"xxxxxxxxxxxxxxxxx"
"
```

### 3.11.4 Solution Output

part01test11.output

```
"Result "
"xxxxxxxxxxxxxxxxx"
"x-----x-----x"
"x-----x-x---x"
"x-x-----x--xg-x"
"x-x--x-----x"
```

```
"x-x---x---x--x"
"x-x-----x---x"
"x---x---x----x"
"x-----x-----x-x"
"x-----x---x--x"
"x1-----x"
"xxxxxxxxxxxxxxxx"
"
```

### 3.11.5 stderr

part01test11.err

## 3.12 part01test12

### 3.12.1 Diff

part01test12.diff

### 3.12.2 Input File

part01test12.g

```
(
[
"xxxxxxxxxxxxxxxx",
"x---x-----x-x",
"x-----x",
"x-----x",
"xxx-----xxx",
"x-----x---xx",
"x-----x---x",
"x-----x",
"x-----1x---x-gx",
"x---x--x-----x",
"xxxxxxxxxxxxxxxx"
],
[
"180",
"180",
"cc",
"180",
"180",
"cc",
"cc",
"cc",
"c",
"180",
"180",
"c",
"c",
"c",
"180"
]
)
```

### 3.12.3 Submission Output

part01test12.output

```
"Result"
"xxxxxxxxxxxxxxxx"
```

```

"x-----x--x---x"
"xg-x---x-----x"
"x-----x"
"x--x-----x"
"xx---x-----x"
"xxx-----xxx"
"x-----x"
"x-----x"
"x-x-----1-x---x"
"xxxxxxxxxxxxxxxxx"
" "

```

### 3.12.4 Solution Output

part01test12.output

```

"Result "
"xxxxxxxxxxxxxxxxx"
"x-----x--x---x"
"xg-x---x-----x"
"x-----x"
"x--x-----x"
"xx---x-----x"
"xxx-----xxx"
"x-----x"
"x-----x"
"x-x-----1-x---x"
"xxxxxxxxxxxxxxxxx"
" "

```

### 3.12.5 stderr

part01test12.err

## 3.13 part01test13

### 3.13.1 Diff

part01test13.diff

### 3.13.2 Input File

part01test13.g

```

(
[
"xxxxxxxxxxxxxxxxxxxxxx",
"x-----x--x---xx--x",
"x--x-----x",
"xx-----x---xx",
"x-1---xx-----x--x",
"x-x--x---xx-----x",
"x-x-x-----x---x-xx",
"x-----x---x",
"xx--g---x-----x-x",
"xxxxxxxxxxxxxxxxxxxxxx",
],
[
" c ",
" c c ",
" c ",

```

```
"c",
"180",
"180",
"cc",
"c"
]
)
```

### 3.13.3 Submission Output

part01test13.output

```
"Result "
"xxxxxxxxxxxx"
"xx----x--x"
"x--xx----x"
"x-----x"
"x--x---x-x"
"xg--x----x"
"x----1---x"
"x----x--xx"
"x----x---x"
"xx-----x"
"x--xx---xx"
"x--x----x"
"x-----x"
"x----x--x"
"x-x-----xx"
"x--x-x---xx"
"xx-----x"
"x--x--x--x"
"xxxxxxxxxxxx"
""
```

### 3.13.4 Solution Output

part01test13.output

```
"Result "
"xxxxxxxxxxxx"
"xx----x--x"
"x--xx----x"
"x-----x"
"x--x---x-x"
"xg--x----x"
"x----1---x"
"x----x--xx"
"x----x---x"
"xx-----x"
"x--xx---xx"
"x--x----x"
"x-----x"
"x----x--x"
"x-x-----xx"
"x--x-x---xx"
"xx-----x"
"x--x--x--x"
"xxxxxxxxxxxx"
""
```

### 3.13.5 stderr

part01test13.err

## 3.14 part01test14

### 3.14.1 Diff

part01test14.diff

### 3.14.2 Input File

part01test14.g

```
(  
[  
"xxxxxxxxxxxxxxxxx",  
"x-----xxx---x",  
"x---x-----x",  
"x-----x-----x",  
"x-----xx-x",  
"x-----x",  
"x-x-x-----x",  
"x-----x",  
"xx-----1---x",  
"x-x-----g---x",  
"x-----x---x",  
"x-x--x-----x",  
"x----xx-x---x",  
"x-----x---x",  
"x-----xxxx",  
"x-xx-----x",  
"xxxxxxxxxxxxxxxxx",  
],  
[  
"cc",  
"c",  
"cc",  
"c",  
"cc",  
"180",  
"c",  
"180",  
"180",  
"180",  
"cc",  
"c",  
"180"  
]  
)
```

### 3.14.3 Submission Output

part01test14.output

```
"Result "  
"xxxxxxxxxxxxxxxxx"  
"x-----x-x"  
"x---x-----x-x"  
"x---x-----x-x"  
"xx-----g---x--x"  
"xx-----x-x---x"  
"xx-----x-x"
```

```
"x--x-----x--x"
"x-----xx--x"
"x-x--x-----x"
"x-----xx"
"x-----x-1x-x--xx"
"x-----x-----x"
"xxxxxxxxxxxxxxxx"
"
```

### 3.14.4 Solution Output

part01test14.output

```
"Result"
"xxxxxxxxxxxxxxxx"
"x-----x-x"
"x--x-----x-x"
"x--x-----x-x"
"xx-----g--x--x"
"xx-----x-x--x"
"xx-----x"
"x--x-----x--x"
"x-----xx--x"
"x-x--x-----x"
"x-----xx"
"x-----x-1x-x--xx"
"x-----x-----x"
"xxxxxxxxxxxxxxxx"
"
```

### 3.14.5 stderr

part01test14.err

## 3.15 part01test15

### 3.15.1 Diff

part01test15.diff

### 3.15.2 Input File

part01test15.g

```
(
[
"xxxxxxxxxxxxxxxx",
"x----x-----xx",
"x-----x--x",
"xx-1-----xx",
"x-----x",
"x-----x--x",
"x-----g-x",
"x-x--x--x--x",
"xx--x-x-x--x",
"xx-----x--xx",
"x-----x--x",
"x-----x",
"xx----xx--x-x",
"x-----x--xx-x",
"xxxxxxxxxxxxxxxx"

```



```
],
[
" c ",
" c ",
" cc ",
" c ",
" cc ",
" c ",
"180",
"180",
" cc ",
" cc ",
"180",
"180",
" c "
]
)
```

### 3.15.3 Submission Output

part01test15.output

```
"Result "
"xxxxxxxxxxxxxxxxxxx "
"x-x--xx----x--x "
"x-----x-----x "
"x-----x-----x "
"x-----x-----x "
"x-----x-----xx "
"xxx---x-----x "
"x-x-x-----x "
"x----xxx-x----x "
"xx-----x-x "
"xxx-----g--1--x "
"x----x-----x-xx "
"xxxxxxxxxxxxxxxxxxx "
"
```

### 3.15.4 Solution Output

part01test15.output

```
"Result "
"xxxxxxxxxxxxxxxxxxx "
"x-x--xx----x--x "
"x-----x-----x "
"x-----x-----x "
"x-----x-----xx "
"xxx---x-----x "
"x-x-x-----x "
"x----xxx-x----x "
"xx-----x-x "
"xxx-----g--1--x "
"x----x-----x-xx "
"xxxxxxxxxxxxxxxxxxx "
"
```

### 3.15.5 stderr

part01test15.err

## 3.16 part01test16

### 3.16.1 Diff

part01test16.diff

### 3.16.2 Input File

part01test16.g

```
(  
[  
"xxxxxxxxxxxx",  
"x-----x",  
"xx-----x",  
"x--x---x-x",  
"xx-1-----x",  
"xx--x--x-x",  
"x-----g-xx",  
"x-----xx",  
"x-x-----x",  
"x---x-----x",  
"xx----x--x",  
"xx-----x",  
"x-----x--x",  
"x-----x",  
"x-----x",  
"xxxxxxxxxxxx",  
],  
[  
"180",  
"c",  
"c",  
"cc",  
"cc",  
"cc",  
"180",  
"180",  
"180",  
"cc",  
"180",  
"180",  
"c",  
]  
)
```

### 3.16.3 Submission Output

part01test16.output

```
"Result "  
"xxxxxxxxxxxx"  
"x-----x"  
"x-----x"  
"x--x-----x"  
"x-----xx"  
"x--x-----xx"  
"x-----x---x"  
"x-----x-x"  
"xx-----x"  
"xx-g-----x"
```

```
"x-x--x--xx"
"x-----1-xx"
"x-x---x--x"
"x-----xx"
"x-----x"
"xxxxxxxxxxx"
"
```

### 3.16.4 Solution Output

part01test16.output

```
"Result"
"xxxxxxxxxxx"
"x-----x"
"x-----x"
"x--x-----x"
"x-----xx"
"x--x-----xx"
"x-----x--x"
"x-----x-x"
"xx-----x"
"xx-g-----x"
"x-x--x--xx"
"x-----1-xx"
"x-x---x--x"
"x-----xx"
"x-----x"
"xxxxxxxxxxx"
"
```

### 3.16.5 stderr

part01test16.err

## 3.17 part01test17

### 3.17.1 Diff

part01test17.diff

### 3.17.2 Input File

part01test17.g

```
(
[
"xxxxxxxxxxx",
"xx--x-----x",
"x--x--x--xx",
"x-----g-----x",
"x-----x",
"xx-----x",
"x-x-----xx",
"x--x-x--xx",
"x-----x-xx",
"x---x----1x",
"x-----x--x",
"x-----x--x",
"x----xx-x-x",
"x-x-----x",
```

```

"xxxxxxxxxxxxx"
],
[
"180",
"c",
"c",
"cc",
"180",
"c",
"c"
]
)

```

### 3.17.3 Submission Output

part01test17.output

```

"Result "
"xxxxxxxxxxxxx"
"x-----x-x"
"x-x-xx----x"
"x--x-----x"
"x--x-----x"
"x1----x---x"
"xx-x-----x"
"xx---x-x--x"
"xx-----x-x"
"x-----xx"
"x-----x"
"x----g----x"
"xx--x--x--x"
"x-----x--xx"
"xxxxxxxxxxxxx"
"

```

### 3.17.4 Solution Output

part01test17.output

```

"Result "
"xxxxxxxxxxxxx"
"x-----x-x"
"x-x-xx----x"
"x--x-----x"
"x--x-----x"
"x1----x---x"
"xx-x-----x"
"xx---x-x--x"
"xx-----x-x"
"x-----xx"
"x-----x"
"x----g----x"
"xx--x--x--x"
"x-----x--xx"
"xxxxxxxxxxxxx"
"

```

### 3.17.5 stderr

part01test17.err

## 3.18 part01test18

### 3.18.1 Diff

part01test18.diff

### 3.18.2 Input File

part01test18.g

```
(  
[  
"xxxxxxxxxxxxxxxxxx",  
"x-xx-----x--x",  
"x--x-----x---x",  
"x-----x",  
"xg--x---x-----x",  
"x-----x-----x",  
"xx----x-1--xx-x",  
"x--x--xx--x---x",  
"x-----x-x---x",  
"x-----x",  
"xxxxxxxxxxxxxxxxxx",  
],  
[  
"c",  
"180",  
"cc",  
"180",  
"cc",  
"c",  
"c",  
"c",  
"cc",  
"180",  
"180",  
"180",  
"c",  
"180",  
"180"  
]  
)
```

### 3.18.3 Submission Output

part01test18.output

```
"Result "  
"xxxxxxxxxxxxxx"  
"x---x-g---x"  
"x-----xx"  
"x--x----xxx"  
"x-----x---x"  
"x-----x"  
"x--xx-----x"  
"x--x-----x"  
"x-x--xx---x"  
"x-----x"  
"x-xx1---x-x"  
"x---x-----xx"  
"x---x-----x"
```

```
"x-----x"
"xxxxxxxxxxxx"
"
```

### 3.18.4 Solution Output

part01test18.output

```
"Result"
"xxxxxxxxxxxx"
"x--x-g--x"
"x-----xx"
"x--x----xxx"
"x-----x--x"
"x-----x"
"x--xx-----x"
"x--x-----x"
"x-x--xx---x"
"x-----x"
"x-xx1---x-x"
"x--x-----xx"
"x--x-----x"
"x-----x"
"xxxxxxxxxxxx"
"
```

### 3.18.5 stderr

part01test18.err

## 3.19 part01test19

### 3.19.1 Diff

part01test19.diff

### 3.19.2 Input File

part01test19.g

```
(
[
"xxxxxxxxxxxxxxxx",
"x-x-----xx",
"x----x-----x-x",
"x--xxxx--x--g-x",
"x----x-x----x-x",
"x-----x-----x",
"x-----x---x",
"x---x--x-----x",
"x-----x---x",
"x-1---x-x-----xx",
"x---x-----x",
"x--x-----x",
"x-----x-----x",
"xxxxxxxxxxxxxxxx"
],
[
"c",
"180"
]
)
```

### 3.19.3 Submission Output

part01test19.output

```
"Result "  
"xxxxxxxxxxxxxxxxxx "  
"x-----x "  
"x-----xx "  
"x-x-----x-x "  
"x--x--x--x--x "  
"x--1----xxx-x "  
"xx--x-----x-x "  
"x-----x--x--xx "  
"x--x--x--x--x "  
"x-----x-x "  
"x-----x-x-x--x "  
"x-----x "  
"x-----xgx-x "  
"x--x-----xx "  
"xxxxxxxxxxxxxxxxxx "  
"
```

### 3.19.4 Solution Output

part01test19.output

```
"Result "  
"xxxxxxxxxxxxxxxxxx "  
"x-----x "  
"x-----xx "  
"x-x-----x-x "  
"x--x--x--x--x "  
"x--1----xxx-x "  
"xx--x-----x-x "  
"x-----x--x--xx "  
"x--x--x--x--x "  
"x-----x-x "  
"x-----x-x-x--x "  
"x-----x "  
"x-----xgx-x "  
"x--x-----xx "  
"xxxxxxxxxxxxxxxxxx "  
"
```

### 3.19.5 stderr

part01test19.err

## 3.20 part01test20

### 3.20.1 Diff

part01test20.diff

### 3.20.2 Input File

part01test20.g

```
(  
[  
"xxxxxxxxxxx",  
"x-----xxx-x",
```

```

"x-----x",
"xx-----x",
"xx-----xxx",
"xx-x--x-xx",
"xxg-----xx",
"x-----x",
"x--1-----x",
"x-----xx--x",
"x-x-----x",
"xxxxxxxxxxxx",
],
[
"c",
"c",
"180",
"c",
"180",
"cc",
"180",
"180",
"cc",
"180",
"cc",
"cc",
"180",
"180",
"180"
]
)

```

### 3.20.3 Submission Output

part01test20.output

```

"Result "
"xxxxxxxxxxxxxx"
"x----xxxx--x"
"xx---g-----x"
"x-----x----x"
"x-----x"
"x-x-----xx"
"x-x---x---xx"
"x-----x--xx"
"x--1-xxx---x"
"xxxxxxxxxxxxxx"
"

```

### 3.20.4 Solution Output

part01test20.output

```

"Result "
"xxxxxxxxxxxxxx"
"x----xxxx--x"
"xx---g-----x"
"x-----x----x"
"x-----x"
"x-x-----xx"
"x-x---x---xx"
"x-----x--xx"
"x--1-xxx---x"
"xxxxxxxxxxxxxx"

```



""

### 3.20.5 stderr

part01test20.err

## 3.21 part01test21

### 3.21.1 Diff

part01test21.diff

### 3.21.2 Input File

part01test21.g

```
(
[
"xxxxxxxxxxxxxxxx",
"x-----x",
"x--x-----x",
"xx--x-xxx--x",
"xx-----x",
"x--xx-x-x--x",
"x--x--x----x",
"xx---x----xx",
"xx---x----x",
"x-----x",
"x-----x-x",
"x---xx-----x",
"x-----x----x",
"x---x----x-x",
"x-----x---x",
"x--1----x--x",
"x-x--xg-xx-x",
"x----x----xx",
"x--x--x---xx",
"xxxxxxxxxxxxxxxx",
],
[
"c"
]
)
```

### 3.21.3 Submission Output

part01test21.output

```
"Result "
"xxxxxxxxxxxxxxxxxxxxxxxxxxxx"
"x-----xx--xx--x"
"x--x-----x"
"xx-----xx--x-x"
"x-----x-x-----x-x--x"
"x-xx----x--xx-----x"
"xx-g---x-----xx-x--x"
"x---1x-----x--x"
"x--xx-----x-x--x"
"x--x--x--x-----x"
"xxx-----x-----x"
"xxxxxxxxxxxxxxxxxxxxxxxxxxxx"
""
```

### 3.21.4 Solution Output

part01test21.output

```
"Result "  
"xxxxxxxxxxxxxxxxxxxxxx "  
"x-----xx--xx--x "  
"x--x-----x "  
"xx-----xx--x-x "  
"x-----x-x-----x-x--x "  
"x-xx-----x--xx-----x "  
"xx-g---x-----xx-x--x "  
"x--1x-----x--x "  
"x--xx-----x-x--x "  
"x--x--x--x-----x "  
"xxx-----x-----x "  
"xxxxxxxxxxxxxxxxxxxxxx "  
"
```

### 3.21.5 stderr

part01test21.err

## 3.22 part01test22

### 3.22.1 Diff

part01test22.diff

### 3.22.2 Input File

part01test22.g

```
(  
[  
"xxxxxxxxxxxxxxxxxxxxxx",  
"x-----x-----x--x",  
"xxx-----x-x--x-----x",  
"x-----x-----x--x",  
"x-----x-x-----xxxx",  
"x-----x-1-----x",  
"x-----x-----xxx",  
"x--x-----x-----x",  
"x-----x-x-----x--x",  
"x-----x-x-----x--x",  
"x-----x-x-----x--x",  
"x-----g-----x",  
"xx--xx-x-----x",  
"xxxxxxxxxxxxxxxxxxxxxx"  
],  
[  
"180",  
"c",  
"180"  
]  
)
```

### 3.22.3 Submission Output

part01test22.output

```
"Result "  
"xxxxxxxxxxxxxxxxxxxxxx "
```

```

"x-----x-xx--xx"
"x-----g----x"
"x--x--x-----x"
"x--x-----x-x----x"
"x-----x-----x--x"
"xxx-----x-----x"
"x-----x-----x"
"xxxx-----x-x----x"
"x--x-----1-----x"
"x-----x--x-x-----xxx"
"x-----x-----x-----x"
"xxxxxxxxxxxxxxxxxxxxxx"
"

```

### 3.22.4 Solution Output

part01test22.output

```

"Result"
"xxxxxxxxxxxxxxxxxxxxxx"
"x-----x-xx--xx"
"x-----g----x"
"x--x--x-----x"
"x--x-----x-x----x"
"x-----x-----x--x"
"xxx-----x-----x"
"x-----x-----x"
"xxxx-----x-x----x"
"x--x-----1-----x"
"x-----x--x-x-----xxx"
"x-----x-----x-----x"
"xxxxxxxxxxxxxxxxxxxxxx"
"

```

### 3.22.5 stderr

part01test22.err

## 3.23 part01test23

### 3.23.1 Diff

part01test23.diff

### 3.23.2 Input File

part01test23.g

```

(
[
"xxxxxxxxxxxx",
"x-----x",
"xx-----x",
"x-----x",
"x-x-----x",
"x-x-----x",
"x--x--x-x",
"x-----1-x",
"x-----g-x",
"xxxxxxxxxxxx"
],

```

```
[
"cc",
"c",
"180",
"180",
"c",
"c",
"180",
"180",
"c",
"180",
"180"
]
)
```

### 3.23.3 Submission Output

part01test23.output

```
"Result "
"xxxxxxxxxxx "
"x-----x"
"x-----x-gx"
"x-----x"
"x-----x"
"x-----x--x"
"x-----x"
"x---xx---x"
"x-x---1-x"
"xxxxxxxxxxx "
"
```

### 3.23.4 Solution Output

part01test23.output

```
"Result "
"xxxxxxxxxxx "
"x-----x"
"x-----x-gx"
"x-----x"
"x-----x"
"x-----x--x"
"x-----x"
"x---xx---x"
"x-x---1-x"
"xxxxxxxxxxx "
"
```

### 3.23.5 stderr

part01test23.err

## 3.24 part01test24

### 3.24.1 Diff

part01test24.diff

### 3.24.2 Input File

part01test24.g

```
(  
[  
"xxxxxxxxxxxxxxxxxxxx",  
"x----1-----x--x",  
"x--x-----x-x",  
"x--x--x-----x",  
"x-----x-----xx",  
"x-----xxxg--x-x",  
"x-----x-----x",  
"x--x-----xxx--x",  
"x-----x-----x-x",  
"xxxxxxxxxxxxxxxxxxxx",  
],  
[  
"180",  
"180",  
"180"  
]  
)
```

### 3.24.3 Submission Output

part01test24.output

```
"Result "  
"xxxxxxxxxxxxxxxxxxxx "  
"x-x-----x-----x "  
"x--xxx-----x--x "  
"x----x-----x "  
"x-x--gxxx-----x "  
"xx-----x-----x "  
"x-----x--x--x "  
"x-x-----x--x "  
"x--x-----1----x "  
"xxxxxxxxxxxxxxxxxxxx "  
" "
```

### 3.24.4 Solution Output

part01test24.output

```
"Result "  
"xxxxxxxxxxxxxxxxxxxx "  
"x-x-----x-----x "  
"x--xxx-----x--x "  
"x----x-----x "  
"x-x--gxxx-----x "  
"xx-----x-----x "  
"x-----x--x--x "  
"x-x-----x--x "  
"x--x-----1----x "  
"xxxxxxxxxxxxxxxxxxxx "  
" "
```

### 3.24.5 stderr

part01test24.err

## 3.25 part01test25

### 3.25.1 Diff

### 3.25.2 Input File

part01test25.g

```
(
[
"xxxxxxxxxxxxxxxx",
"x-----x--x",
"x---g-----x",
"x---x-----x",
"x-----x",
"x-x-x--x---x",
"x---x-x-x1--x",
"x---x-----x",
"x-----x",
"x---xx-----x",
"x-----x-----x",
"xxxxxxxxxxxxxxxx"
],
[
"c",
"cc",
"c",
"c"
]
)
```

### 3.25.3 Submission Output

part01test25.output

```
"Result "
"xxxxxxxxxxxxxxxx"
"x-----x"
"x-----x-----x"
"x-----x"
"x-x--xx--g-x"
"x-x-x---x--x"
"xx---x-----x"
"x-----x-----x"
"x-----x-----x"
"x-----xx"
"x-----x"
"x-----1-----x"
"xxxxxxxxxxxxxxxx"
"
```

### 3.25.4 Solution Output

part01test25.output

```
"Result "
"xxxxxxxxxxxxxxxx"
"x-----x"
"x-----x-----x"
"x-----x"
"x-x--xx--g-x"
"x-x-x---x--x"
"xx---x-----x"
"x-----x-----x"
```

```
"x----x----x"
"x-----xx"
"x-----x"
"x----1----x"
"xxxxxxxxxxxx"
"
```

### 3.25.5 stderr

part01test25.err

## 3.26 part01test26

### 3.26.1 Diff

part01test26.diff

### 3.26.2 Input File

part01test26.g

```
(
[
"xxxxxxxxxxx",
"x----x---x",
"xxx-----x",
"x-x-----x",
"x-----x",
"x-x---xx-x",
"xx-----x",
"x-----x",
"x-----x",
"xx---x---x",
"xx---x--x",
"x---x----x",
"x---x---1x",
"x-----x",
"x----g---x",
"xx-x--x--x",
"xx---x---x",
"x--x-----x",
"xxxxxxxxxxx"
],
[
"cc",
"cc",
"cc",
"180",
"cc",
"180",
"c",
"180",
"cc"
]
)
```

### 3.26.3 Submission Output

part01test26.output

```
"Result"
```

```

"xxxxxxxxxxxxxxxxxxxxxxxx"
"x-----x"
"x----x-----x"
"x----x----x----x--x"
"xx-----x--1-g-x-x"
"x-----xx-----x"
"x-----x-xx"
"x-xx-x-----x"
"x-x--x--xx-----xx-x"
"xxxxxxxxxxxxxxxxxxxxxxxx"
"

```

### 3.26.4 Solution Output

part01test26.output

```

"Result "
"xxxxxxxxxxxxxxxxxxxxxxxx"
"x-----x"
"x----x-----x"
"x----x----x----x--x"
"xx-----x--1-g-x-x"
"x-----xx-----x"
"x-----x-xx"
"x-xx-x-----x"
"x-x--x--xx-----xx-x"
"xxxxxxxxxxxxxxxxxxxxxxxx"
"

```

### 3.26.5 stderr

part01test26.err

## 3.27 part01test27

### 3.27.1 Diff

part01test27.diff

### 3.27.2 Input File

part01test27.g

```

(
[
"xxxxxxxxxxxxxxxxxxxxxxxx",
"x-----x--1-----x",
"xx-----x-----x--x",
"x-----x",
"x----x--x-x-----x--x",
"x--x-----x-----x",
"x-----x--x",
"x-x-----x-x--x-----x",
"x--x-----x-----x",
"x-----x-----x",
"x-----xx--x-x",
"x-g-----xx",
"xxxxxxxxxxxxxxxxxxxxxxxx"
],
[
"cc",

```



```

"c",
"180",
"c",
"c",
"180",
"cc",
"cc",
"cc",
"c",
"c",
"cc",
"180"
]
)

```

### 3.27.3 Submission Output

part01test27.output

```

"Result "
"xxxxxxxxxxxxxxxx "
"x-----xx "
"x-----x-x "
"x-x-x-x-----x "
"x-----x "
"x-----x-----x "
"x-----x-x "
"x----x-----x-x "
"x---x--x-----x "
"x-----x "
"x1x-x--x-----x "
"xx-----x "
"x-----x "
"x-----x--x "
"x---x-----x "
"x-----x---x "
"x----x-----x "
"x-----x---gx "
"x-x-----x "
"xxxxxxxxxxxxxxxx "
"

```

### 3.27.4 Solution Output

part01test27.output

```

"Result "
"xxxxxxxxxxxxxxxx "
"x-----xx "
"x-----x-x "
"x-x-x-x-----x "
"x-----x "
"x-----x-----x "
"x-----x-x "
"x----x-----x-x "
"x---x--x-----x "
"x-----x "
"x1x-x--x-----x "
"xx-----x "
"x-----x "
"x-----x--x "
"x---x-----x "

```

```

"x-----x---x"
"x-----x-----x"
"x-----x---gx"
"x-x-----x"
"xxxxxxxxxxxxxxxx"
"

```

### 3.27.5 stderr

part01test27.err

## 3.28 part01test28

### 3.28.1 Diff

part01test28.diff

### 3.28.2 Input File

part01test28.g

```

(
[
"xxxxxxxxxxxxxxxxxxxx",
"x-----x-----xx",
"x-x-----x-----x-x",
"x-----xx-----x",
"x-x-----x-x--x",
"xxx--g-----x-x",
"x-----x--x-xx",
"x-x-----x",
"x----x-----x--x",
"x-----x1-----x",
"xxxxxxxxxxxxxxxxxxxx",
],
[
"180",
"180",
"180",
"cc",
"cc",
"c",
"180"
]
)

```

### 3.28.3 Submission Output

part01test28.output

```

"Result"
"xxxxxxxxxxxxxxxxxxxx"
"x-----x-----x"
"x---x-----x-----x"
"x-----1-----x-x"
"xx-x--x-----x"
"x-x-----g---xxx"
"x--x-x-----x-x"
"x-----xx-----x"
"x-x-----x-----x-x"
"xx-----x-----x"

```

```
"xxxxxxxxxxxxxxxxxxxxx"
"
```

### 3.28.4 Solution Output

part01test28.output

```
"Result "
"xxxxxxxxxxxxxxxxxxxxx"
"x-----x-----x"
"x---x-----x---x"
"x-----1-----x-x"
"xx-x--x-----x"
"x-x-----g--xxx"
"x--x-x-----x-x"
"x-----xx-----x"
"x-x-----x----x-x"
"xx-----x-----x"
"xxxxxxxxxxxxxxxxxxxxx"
"
```

### 3.28.5 stderr

part01test28.err

## 3.29 part01test29

### 3.29.1 Diff

part01test29.diff

### 3.29.2 Input File

part01test29.g

```
(
[
"xxxxxxxxxxxx",
"x----x---x",
"x--x-----x",
"xx-----xx",
"x-----x--x",
"xx-x----xx",
"x---x----x",
"xx--x---xx",
"x-x-----x",
"x-g----1-x",
"xxxxxxxxxxxx",
],
[
"180",
"c",
"180",
"180",
"c",
"c",
"c",
"cc",
"c",
"180",
"c",

```

```

" c ",
" c ",
" cc ",
" c ",
" cc ",
"180",
" c ",
"180",
" cc "
]
)

```

### 3.29.3 Submission Output

part01test29.output

```

"Result "
"xxxxxxxxxxxx"
"x-----g-x"
"x-----x-x"
"xx---x--xx"
"x----x---x"
"xx----x-xx"
"x--x-----x"
"xx-----xx"
"x-----x--x"
"x-1-x----x"
"xxxxxxxxxxxx"
" "

```

### 3.29.4 Solution Output

part01test29.output

```

"Result "
"xxxxxxxxxxxx"
"x-----g-x"
"x-----x-x"
"xx---x--xx"
"x----x---x"
"xx----x-xx"
"x--x-----x"
"xx-----xx"
"x-----x--x"
"x-1-x----x"
"xxxxxxxxxxxx"
" "

```

### 3.29.5 stderr

part01test29.err

## 3.30 part01test30

### 3.30.1 Diff

part01test30.diff

### 3.30.2 Input File

```
(
[
"xxxxxxxxxxxx",
"xx--x1--xx",
"x-----x-x",
"x-----x",
"x--x----x",
"x-----xx",
"xx-----gxx",
"x----x---x",
"x-----x",
"x-----x",
"x-----x",
"x-----x--x",
"x-----x",
"x--x--x-x",
"xx-----x",
"x-----x",
"x-----x",
"x--x----xx",
"xxxxxxxxxxxx",
],
[
"cc",
"cc",
"180",
"c",
"c",
"cc",
"cc",
"180"
]
)
```

### 3.30.3 Submission Output

part01test30.output

```
"Result "
"xxxxxxxxxxxxxxxxxxxxx"
"xx---xx-----xx"
"x-x---g-----x---x"
"x-----x-----x"
"x1-----x-----x"
"xx--x-----x---x"
"x-----xx"
"x-----x"
"xx---x-----x---x"
"xxxxxxxxxxxxxxxxxxxxx"
"
```

### 3.30.4 Solution Output

part01test30.output

```
"Result "
"xxxxxxxxxxxxxxxxxxxxx"
"xx---xx-----xx"
"x-x---g-----x---x"
"x-----x-----x"
"x1-----x-----x"
"xx--x-----x---x"
```

```

"x-----xx"
"x-----x"
"xx---x-----x---x"
"xxxxxxxxxxxxxxxxxxx"
"

```

### 3.30.5 stderr

part01test30.err

## 3.31 Source Code

csce322hw03pt01.hs

```

1 import Prelude
2 import System.Environment ( getArgs )
3 import Data.List
4 import Helpers
5
6 -- The main method that will be used for testing / command line access
7 main = do
8   args <- getArgs
9   filename <- readFile (head args)
10  (maze,moves) <- readGravityMazeFile filename
11  -- print "original"
12  -- printMaze maze
13  -- print "moves"
14  -- print (head moves)
15  -- print "onePlayerOneRotation: "
16  print "Result"
17  printMaze (onePlayerOneRotation maze (head moves))
18
19 -- YOUR CODE SHOULD COME AFTER THIS POINT
20 onePlayerOneRotation :: [[Char]] -> [Char] -> [[Char]]
21
22 onePlayerOneRotation [] _ = []
23 onePlayerOneRotation maze move
24   | move == "c"   = clockwiseMazewithoutPlayerIndexAsInput maze
25   | move == "cc"  = cclockwiseMazewithoutPlayerIndexAsInput maze
26   | move == "180" = flipMazewithouIndexAsInput maze
27   | otherwise     = maze

```

# Chapter 4

## csce322hw03pt02.hs

### 4.1 part02test01

#### 4.1.1 Diff

part02test01.diff

#### 4.1.2 Input File

part02test01.g

```
(
[
"xxxxxxxxxxx",
"x---1---xx",
"x--x-----x",
"x-----x",
"x-----xx",
"x-----xxx",
"x----x-x-x",
"x---x-----x",
"x-----x-x",
"x-g-----xx",
"x-----xx-x",
"x-----x",
"x-x-----x",
"xxxxxxxxxxx"
],
[
"cc",
"c",
"c",
"180",
"180",
"cc",
"c",
"c",
"c",
"cc",
"180",
"180",
"180",
"180",
"c",
"cc",
"c",

```

```
"cc",
"cc",
"180"
]
)
```

### 4.1.3 Submission Output

part02test01.output

```
"Result "
"xxxxxxxxxxxxxxxxxxx"
"xx--xx---x---x"
"x----xx-x-x--x"
"x-----x--x"
"x-----x-----x"
"x-----x-----x"
"x-----x-----x"
"x-x-----x"
"x-----g--xx"
"x1-----x"
"xxxxxxxxxxxxxxxxxxx"
"
```

### 4.1.4 Solution Output

part02test01.output

```
"Result "
"xxxxxxxxxxxxxxxxxxx"
"xx--xx---x---x"
"x----xx-x-x--x"
"x-----x--x"
"x-----x-----x"
"x-----x-----x"
"x-x-----x"
"x-----g--xx"
"x1-----x"
"xxxxxxxxxxxxxxxxxxx"
"
```

### 4.1.5 stderr

part02test01.err

## 4.2 part02test02

### 4.2.1 Diff

part02test02.diff

### 4.2.2 Input File

part02test02.g

```
(
[
"xxxxxxxxxxxxxxxxxxxxxxxx",
"x-----x-----x",
"x-----x--x",
"x-xx---x-----x",
"x-----xx--x",
"x-----x-----x-x",

```



### 4.2.3 Submission Output

```

Result "
"xxxxxxxxxxxxxxxxxxxxxxxxxx"
"x--x--x--x--x--x--x"
"x-----xx-----x--x"
"x-----g-----x--x"
"xx--x--x-----x"
"x---xx-x-x-----x"
"x-----x"
"xx--xx-x-----x--x"
"xxx-x-----x"
"x-x---xx-----x--x"
"x-----x--x-----x"
"x-----x-----xx"
"xx-----x-----x"
"x-----x-----x"
"x-x-----x-----x"
"x-----x-----x"
"x---xxx-----x-x-x"
"xxx--x-----x-----x"
"x---1x-----x-----x"
"xxxxxxxxxxxxxxxxxxxxxxxxxx"

```

" "

## 4.2.4 Solution Output

part02test02.output

```
"Result "  
"xxxxxxxxxxxxxxxxxxxxxx "  
"x---x--x--x-x-----x "  
"x-----xx-----x--x "  
"x-----g-----x--x "  
"xx--x---x-----x "  
"x----xx-x-x-----x "  
"x-----x "  
"xx---xx-x-----x--x "  
"xxx-x-----x "  
"x-x---xx-----x--x "  
"x-----x--x-----x "  
"x-----x-----xx "  
"xx-----x-----x "  
"x-----x-----x "  
"x-x-----x "  
"x-----x--x "  
"x---xxx-----x-x-x "  
"xxx--x-----x--x "  
"x---1x-----x "  
"xxxxxxxxxxxxxxxxxxxxxx "  
" "
```

## 4.2.5 stderr

part02test02.err

## 4.3 part02test03

### 4.3.1 Diff

part02test03.diff

### 4.3.2 Input File

part02test03.g

```
(  
[  
"xxxxxxxxxxxxxxxxxxxxxx ",  
"x-x-----x-----x ",  
"x-x---x-----x ",  
"x-----1x-x ",  
"x-----x--x--x ",  
"xx--xx-----x ",  
"x--xx--x-----x ",  
"x-----x---x ",  
"x-----x--x---x ",  
"x--xxx-g-----xx ",  
"x----x-----x ",  
"xxxxxxxxxxxxxxxxxxxxxx "  
],  
[  
"cc",  
"180",
```

```

"c",
"180",
"c",
"180",
"c",
"180",
"c",
"c",
"c",
"cc",
"c",
"c",
"cc",
"cc"
]
)

```

### 4.3.3 Submission Output

part02test03.output

```

"Result "
"xxxxxxxxxxxxxx"
"x-----x-x"
"x--x-----x"
"x--x-----x"
"x-----xx--x"
"x-----x"
"x--x-----x"
"xx----x-xg-x"
"x-x--1-----x"
"x----x---xxx"
"x----xx--x-x"
"x----x--x-x"
"xxx-----x"
"x----x-----x"
"xxxxxxxxxxxxxx"
"

```

### 4.3.4 Solution Output

part02test03.output

```

"Result "
"xxxxxxxxxxxxxx"
"x-----x-x"
"x--x-----x"
"x--x-----x"
"x-----xx--x"
"x-----x"
"x--x-----x"
"xx----x-xg-x"
"x-x--1-----x"
"x----x---xxx"
"x----xx--x-x"
"x----x--x-x"
"xxx-----x"
"x----x-----x"
"xxxxxxxxxxxxxx"
"

```

### 4.3.5 stderr

part02test03.err

## 4.4 part02test04

### 4.4.1 Diff

part02test04.diff

### 4.4.2 Input File

part02test04.g

```
(  
[  
"xxxxxxxxxxxxxxxx",  
"x-----x",  
"x-----x",  
"x----x-----x",  
"x1-----x---x",  
"x-----x",  
"x-----x",  
"x-----x",  
"xx-----x--x",  
"x----x-xx--x",  
"x--xxx-x-x-x",  
"x-xx--x----x",  
"x-----g--xxx",  
"x-----xxx",  
"xx----x----x",  
"xx--xx-----x",  
"xxxxxxxxxxxxxxxx",  
],  
[  
"180"  
]  
)
```

### 4.4.3 Submission Output

part02test04.output

```
"Result "  
"xxxxxxxxxxxxxxxx"  
"x----xx--xx"  
"x----x----xx"  
"xxx-----x"  
"xxx--g-----x"  
"x----x--xx-x"  
"x-x-x-xxx--x"  
"x--xx-x----x"  
"x--x-----xx"  
"x-----x"  
"x-----x"  
"x-----x"  
"x---x-----x"  
"x-----x"  
"x-----x"  
"x-----1x"  
"xxxxxxxxxxxxxxxx"  
"
```

#### 4.4.4 Solution Output

part02test04.output

```
"Result "  
"xxxxxxxxxxxxxxxx "  
"x-----xx--xx "  
"x-----x-----xx "  
"xxx-----x "  
"xxx--g-----x "  
"x-----x--xx-x "  
"x-x-x-xxx--x "  
"x--xx-x-----x "  
"x--x-----xx "  
"x-----x "  
"x-----x "  
"x-----x "  
"x-----x "  
"x---x-----x "  
"x-----x-----x "  
"x-----x "  
"x-----1x "  
"xxxxxxxxxxxxxxxx "  
" "
```

#### 4.4.5 stderr

part02test04.err

### 4.5 part02test05

#### 4.5.1 Diff

part02test05.diff

#### 4.5.2 Input File

part02test05.g

```
(  
[  
"xxxxxxxxxxxxxxxx",  
"x-----x",  
"x-----1-----x",  
"xx-----x",  
"x-xx-x--g-x",  
"x-xx-----x",  
"x-----x--x",  
"x-x-----x",  
"x-----x",  
"x-x-xx-xx-x",  
"x-----x",  
"x-----x",  
"x-x-x-----x",  
"x-----xx-x",  
"x---xx---xx",  
"x-----xx",  
"xxx--x--x-x",  
"x---x-x---x",  
"x-----xx",  
"xxxxxxxxxxxxxxxx"  
],
```

```
[
"180"
]
)
```

### 4.5.3 Submission Output

part02test05.output

```
"Result "
"xxxxxxxxxxxxx "
"xx-----x "
"x--x-x---x "
"x-x--x---xxx "
"xx-----x "
"xx---xx---x "
"x-xx-----x "
"x-----x-x-x "
"x-----x "
"x-----x "
"x-xx-xx-x-x "
"x-----x "
"x-----x-x "
"x--x-----x "
"x-----xx-x "
"x-g--x-xx-x "
"x-----xx "
"x-----x "
"x----1----x "
"xxxxxxxxxxxxx "
"
```

### 4.5.4 Solution Output

part02test05.output

```
"Result "
"xxxxxxxxxxxxx "
"xx-----x "
"x--x-x---x "
"x-x--x---xxx "
"xx-----x "
"xx---xx---x "
"x-xx-----x "
"x-----x-x-x "
"x-----x "
"x-----x "
"x-xx-xx-x-x "
"x-----x "
"x-----x-x "
"x--x-----x "
"x-----xx-x "
"x-g--x-xx-x "
"x-----xx "
"x-----x "
"x----1----x "
"xxxxxxxxxxxxx "
"
```

### 4.5.5 stderr

part02test05.err

## 4.6 part02test06

### 4.6.1 Diff

part02test06.diff

### 4.6.2 Input File

part02test06.g

```
(
[
"xxxxxxxxxxxxxxxxxxxxxx",
"x-----x-----xx",
"x--x-----x-----x",
"x-----x--x-----x",
"x-----x-----xxx",
"x-----x-----x",
"x-----x--x-x-----x",
"xxxx-----x-----x",
"x-----x--x-----x",
"x--x-----x-x-----x",
"x-----x--x-----x-x",
"xx-----x-----x-x",
"x-----x-----x-x",
"x-xx-----g-----x--x",
"x--x-----x-x-x",
"x--x-----1-x-----x",
"x-----x-----xx",
"x-----x-----x",
"x-----x-x-----x",
"xxxxxxxxxxxxxxxxxxxxxx"
],
[
"c"
]
)
```

### 4.6.3 Submission Output

part02test06.output

```
"Result"
"xxxxxxxxxxxxxxxxxxxxxx"
"x-----x---x-----x"
"x-----x-----x-----x"
"x---xx-----x---x-x"
"x--x-----x-----x"
"xx-----x-----x"
"x-----x-----xx"
"xx-x---x-x-----x---x"
"x-----g-----x-x-----x"
"x-----x-----x-x"
"x-----x-----x-x"
"x---1-----x-x-----x"
"x--x-----x---x"
"x---xx-----x-----x"
"x-----x-----x"
"x---x-xxxx-----x---x"
"x--x-----x---xx"
"xxxxxxxxxxxxxxxxxxxxxx"
"
```

## 4.6.4 Solution Output

part02test06.output

```
"Result "  
"xxxxxxxxxxxxxxxxxxxxxxxx "  
"x-----x---x-----x "  
"x-----x-----x-----x "  
"x----xx-----x----x-x "  
"x--x-----x-----x "  
"xx-----x "  
"x-----x-----xx "  
"xx-x---x-x-----x---x "  
"x-----g---x-x-----x "  
"x-----x-----x-x "  
"x-----x-----x-x "  
"x--1-----x-x-----x "  
"x--x-----x-x "  
"x----xx-----x-----x "  
"x-----x "  
"x----x-xxxx-----x---x "  
"x--x-----x--xx "  
"xxxxxxxxxxxxxxxxxxxxxxxx "  
" "
```

## 4.6.5 stderr

part02test06.err

## 4.7 part02test07

### 4.7.1 Diff

part02test07.diff

### 4.7.2 Input File

part02test07.g

```
(  
[  
"xxxxxxxxxxxxxxxx " ,  
"x---xx-----xxx " ,  
"x-----x---x " ,  
"xx-x-----x--xx " ,  
"xg---x-----x " ,  
"xx-----x " ,  
"xx--xxx-----xx " ,  
"xx-----x " ,  
"x-----x--x " ,  
"x-1-----x----x " ,  
"x-----x " ,  
"xx----xx----x " ,  
"xxxxxxxxxxxxxxxx "  
] ,  
[  
"cc " ,  
"cc " ,  
"c " ,  
"c " ,  
"cc " ,
```



```
"c",
"c"
]
)
```

### 4.7.3 Submission Output

part02test07.output

```
"Result "
"xxxxxxxxxxxxxxxxx"
"xx---xxxgx--x"
"x-----x"
"x-----x--x"
"x-----x---xx"
"x-----x-x--xx"
"xx-----x"
"xx-x-----x"
"x-----xx-x"
"x---x-----x"
"x-----xx"
"x-1---x--x-xx"
"xxxxxxxxxxxxxxxxx"
"
```

### 4.7.4 Solution Output

part02test07.output

```
"Result "
"xxxxxxxxxxxxxxxxx"
"xx---xxxgx--x"
"x-----x"
"x-----x--x"
"x-----x---xx"
"x-----x-x--xx"
"xx-----x"
"xx-x-----x"
"x-----xx-x"
"x---x-----x"
"x-----xx"
"x-1---x--x-xx"
"xxxxxxxxxxxxxxxxx"
"
```

### 4.7.5 stderr

part02test07.err

## 4.8 part02test08

### 4.8.1 Diff

part02test08.diff

### 4.8.2 Input File

part02test08.g

```
(
[
"xxxxxxxxxxxxxxxx",
```

```

"x-----x---x",
"x-----x",
"x--x---x-x-x",
"x-----xxx",
"x-----x--x-x",
"x-----x",
"x--1x---g--x",
"x-x-----x",
"xxxxxxxxxxxxx"
],
[
"c",
"cc",
"cc",
"cc",
"c",
"c",
"cc",
"c",
"cc",
"cc",
]
)

```

### 4.8.3 Submission Output

part02test08.output

```

"Result "
"xxxxxxxxxxxxx"
"x-----x-x"
"x--g---x---x"
"x-----x"
"x-x--x-----x"
"xxx-----x"
"x-x-x---x--x"
"x-----x"
"x---x-----1x"
"xxxxxxxxxxxxx"
"

```

### 4.8.4 Solution Output

part02test08.output

```

"Result "
"xxxxxxxxxxxxx"
"x-----x-x"
"x--g---x---x"
"x-----x"
"x-x--x-----x"
"xxx-----x"
"x-x-x---x--x"
"x-----x"
"x---x-----1x"
"xxxxxxxxxxxxx"
"

```

### 4.8.5 stderr

part02test08.err

## 4.9 part02test09

### 4.9.1 Diff

part02test09.diff

### 4.9.2 Input File

part02test09.g

```
(
[
"xxxxxxxxxxxxxxxxxxxx",
"xx-----x---x",
"x---x-----x--x",
"x---x-----x",
"xxx-----x",
"x-----x-----x",
"x--x----x-----xx",
"x-xx---x--x----x",
"x----g---1x----x",
"x-----x",
"xxxxxxxxxxxxxxxxxxxx",
],
[
"180",
"c",
"c",
"c",
"c",
"c",
"c",
"c",
"c",
"c",
"c",
"180",
"c",
"cc",
"180",
"cc"
]
)
```

### 4.9.3 Submission Output

part02test09.output

```
"Result "
"xxxxxxxxxxxx"
"x-----x---x"
"x-----x"
"x-x-----x"
"xx-----x"
"x-----xx-x"
"x-----x"
"x-----xx---x"
"x-----x--x"
"x-----x"
"x-----g-x"
"x-xx-----x"
```

```
"x-----xx--x"
"x--x--x--x"
"xx-1x-----x"
"xxxxxxxxxxxxx"
"
```

#### 4.9.4 Solution Output

part02test09.output

```
"Result"
"xxxxxxxxxxxxx"
"x-----x---x"
"x-----x"
"x-x-----x"
"xx-----x"
"x-----xx-x"
"x-----x"
"x-----xx--x"
"x-----x--x"
"x-----x"
"x-----g-x"
"x-xx-----x"
"x-----xx--x"
"x--x--x--x"
"xx-1x-----x"
"xxxxxxxxxxxxx"
"
```

#### 4.9.5 stderr

part02test09.err

### 4.10 part02test10

#### 4.10.1 Diff

part02test10.diff

#### 4.10.2 Input File

part02test10.g

```
(
[
"xxxxxxxxxxxxxxxxx",
"x-x-----x",
"x-----x---xxx",
"xx-----x",
"xx-x-----x",
"x-----x-x-x",
"xx-----x-x--x",
"x---xx-----x",
"x--x-x---x-x",
"x-----x-----x",
"x--x-xx-x---x",
"x-----1-----x",
"x-x-----x---x",
"x--g-----x",
"x-----x-x--x",
"x-x-----x-x",

```

```

"xxxxxxxxxxxxxxxxx"
],
[
"c",
"cc",
"cc",
"c",
"cc",
"180",
"180",
"180",
"180",
"180",
"c",
"c",
"c",
"180",
"c",
"cc",
"cc"
]
)

```

### 4.10.3 Submission Output

part02test10.output

```

"Result "
"xxxxxxxxxxxxxxxxx"
"x-----x-xx-1x"
"xx--x-----xx"
"x--g--x-----x--x"
"x-----xx-----x"
"x-----x--x-----x"
"x-----x-x-----x-x"
"x-----x-----x"
"x-x-x-x--x-----x"
"x-----x-----x"
"x-x-----x-----x"
"xx-----x--x--x-x"
"x-----x-x"
"xxxxxxxxxxxxxxxxx"
"

```

### 4.10.4 Solution Output

part02test10.output

```

"Result "
"xxxxxxxxxxxxxxxxx"
"x-----x-xx-1x"
"xx--x-----xx"
"x--g--x-----x--x"
"x-----xx-----x"
"x-----x--x-----x"
"x-----x-x-----x-x"
"x-----x-----x"
"x-x-x-x--x-----x"
"x-----x-----x"
"x-x-----x-----x"
"xx-----x--x--x-x"
"x-----x-x"

```

```
"xxxxxxxxxxxxxxxxxxxxx"
""
```

#### 4.10.5 stderr

part02test10.err

### 4.11 Source Code

csce322hw03pt02.hs

```
1 import Prelude
2 import System.Environment ( getArgs )
3 import Data.List
4 import Helpers
5
6 -- The main method that will be used for testing / command line access
7 main = do
8   args <- getArgs
9   filename <- readFile (head args)
10  (maze,moves) <- readGravityMazeFile filename
11  print "Result"
12  printMaze (onePlayerManyRotations maze moves)
13
14 -- YOUR CODE SHOULD COME AFTER THIS POINT
15 onePlayerManyRotations :: [[Char]] -> [[Char]] -> [[Char]]
16 onePlayerManyRotations maze [] = maze
17 onePlayerManyRotations maze (move:moves)
18   | (not (hasgoal maze)) = maze
19   | otherwise = onePlayerManyRotations (onePlayerOneRotation maze move) moves
20
21 onePlayerOneRotation :: [[Char]] -> [Char] -> [[Char]]
22 onePlayerOneRotation [] _ = []
23 onePlayerOneRotation maze move
24   | move == "c" = clockwiseMazewithoutPlayerIndexAsInput maze
25   | move == "cc" = cclockwiseMazewithoutPlayerIndexAsInput maze
26   | move == "180" = flipMazewithouIndexAsInput maze
27   | otherwise = maze
```

# Chapter 5

## csce322hw03pt03.hs

### 5.1 part03test01

#### 5.1.1 Diff

part03test01.diff

#### 5.1.2 Input File

part03test01.g

```
(
[
"xxxxxxxxxxx",
"x-xx-----x",
"x-----x",
"x-----xx-x",
"x--1x---2x",
"x-x-----x",
"x----gx--x",
"xx-----xx",
"x--x---x-x",
"x-----x",
"x---x----x",
"x-----xx-x",
"xxxxxxxxxxx"
],
[
"cc",
"c",
"cc",
"c",
"c",
"c",
"cc",
"c",
"180",
"cc",
"cc"
]
)
```

#### 5.1.3 Submission Output

part03test01.output

"Result"

```

"xxxxxxxxxxxxx "
"x-xx-----x "
"x-----x "
"x-----xx-x "
"x--x-----x "
"x-x-----x "
"x1---2x--x "
"xx-----xx "
"x--x---x-x "
"x-----x "
"x--x-----x "
"x-----xx-x "
"xxxxxxxxxxxxx "
" "

```

#### 5.1.4 Solution Output

part03test01.output

```

"Result "
"xxxxxxxxxxxxx "
"x-xx-----x "
"x-----x "
"x-----xx-x "
"x--x-----x "
"x-x-----x "
"x1---2x--x "
"xx-----xx "
"x--x---x-x "
"x-----x "
"x--x-----x "
"x-----xx-x "
"xxxxxxxxxxxxx "
" "

```

#### 5.1.5 stderr

part03test01.err

### 5.2 part03test02

#### 5.2.1 Diff

part03test02.diff

```

3d2
< "x-x-----x "
4a4,5
> "xx-----x---x "
> "x-----x-----x "
6,11d6
< "xx-----x "
< "xx-x-x-xx-x "
< "x-g--x-----x "
< "xx-----x "
< "x-----x "
< "x--x-----x "
12a8
> "x-----x--x "
14,16c10,16
< "x-----x-----x "

```



```

< "x---x----xx"
< "x3-----x"
---
> "x-----xx"
> "x---x--4-x"
> "x-xx-x-x-xx"
> "x-----xx"
> "x1-----x"
> "x2-----x"
> "x3-----x-x"

```

### 5.2.2 Input File

part03test02.g

```

(
[
"xxxxxxxxxxxxxxxxxxxx",
"x---42--x-xx---x",
"x-----g-----xx",
"x---1-x---x---x",
"x-x-----x",
"x--x-----xx---x",
"x-----3x",
"x-----x---x",
"x-----x---x",
"x-x-----x",
"xxxxxxxxxxxxxxxxxxxx",
],
[
"c",
"cc",
"cc",
"180",
"180",
"c",
"cc",
"c",
"cc",
"cc",
"180",
"180",
"c",
"c",
"cc",
"180",
"cc",
"180",
"cc",
"180"
]
)

```

### 5.2.3 Submission Output

part03test02.output

```

"Result"
"xxxxxxxxxxxx"
"x-x-----x"
"x-----x"
"x-----x"

```

```

"xx-----x"
"xx-x-x-xx-x"
"x-g--x----x"
"xx-----x"
"x-----x"
"x--x-----x"
"x-----x"
"x-----x"
"x-----x"
"x----x----x"
"x--x----xx"
"x3-----x"
"xxxxxxxxxxxx"
"

```

## 5.2.4 Solution Output

part03test02.output

```

"Result"
"xxxxxxxxxxxx"
"x-----x"
"xx----x---x"
"x----x----x"
"x-----x"
"x-----x"
"x-----x"
"x-----x--x"
"x-----x"
"x-----xx"
"x----x--4-x"
"x-xx-x-x-xx"
"x-----xx"
"x1-----x"
"x2-----x"
"x3-----x-x"
"xxxxxxxxxxxx"
"

```

## 5.2.5 stderr

part03test02.err

## 5.3 part03test03

### 5.3.1 Diff

part03test03.diff

```

5c5
< "x-----x----4x"
---
> "x-----x3---4x"

```

### 5.3.2 Input File

part03test03.g

```

(
[
"xxxxxxxxxxxxxxxx",
"x--g-x-----1x",
"x----4x-----x",
"xxx-----x---x",

```

```

"x-----x--x",
"x3--x-----x---x",
"x-2x-----x",
"x-x---x----x--x",
"x-----x",
"x-x-x-----x",
"x-----x-xx---x",
"xxxxxxxxxxxxxxxx"
],
[
"180",
"c",
"cc",
"c",
"c",
"cc",
"c",
"c",
"180",
"c",
"180",
"cc",
"c",
"cc",
"cc",
"cc",
"cc",
"180",
"c",
"180"
]
)

```

### 5.3.3 Submission Output

part03test03.output

```

"Result "
"xxxxxxxxxxxxxxxx"
"x-----x--x"
"x-x-x---x--x"
"x----x----4x"
"x-x---x----x"
"x-----xx"
"x--x---x-x"
"xx-----x"
"x-----x"
"xx-----x"
"xx----x2x--x"
"x--x--x---x"
"x-----x"
"x-----1x"
"xxxxxxxxxxxxxxxx"
"

```

### 5.3.4 Solution Output

part03test03.output

```

"Result "
"xxxxxxxxxxxxxxxx"
"x-----x--x"
"x-x-x---x--x"

```

```

"x-----x3---4x"
"x-x---x-----x"
"x-----xx"
"x---x---x-x"
"xx-----x"
"x-----x"
"xx-----x"
"xx-----x2x--x"
"x---x--x---x"
"x-----x"
"x-----1x"
"xxxxxxxxxxxxxx"
" "

```

### 5.3.5 stderr

part03test03.err

## 5.4 part03test04

### 5.4.1 Diff

part03test04.diff

### 5.4.2 Input File

part03test04.g

```

(
[
"xxxxxxxxxxxxxx",
"xx-----x--xx",
"x-----x--x",
"x-----3-----x",
"xx--xx-x--x",
"x-----xxxxx",
"x-----2---xx",
"xx-----1--x",
"x-----gx",
"x-x-----x",
"xxx-x-x---x",
"xxxxxxxxxxxxxx"
],
[
"180",
"c"
]
)

```

### 5.4.3 Submission Output

part03test04.output

```

"Result"
"xxxxxxxxxxxxxx"
"xx--xx-g--x"
"x-----x-----x"
"x-x-xx-----x"
"xx--x-----xx"
"x---x-----x"
"x---x-----xx"

```

```
"x-----x"
"x3-----xxx"
"xx--x21x--xx"
"xxxxxxxxxxxxx"
"
```

#### 5.4.4 Solution Output

part03test04.output

```
"Result"
"xxxxxxxxxxxxx"
"xx---xx-g--x"
"x-----x-----x"
"x-x-xx-----x"
"xx---x-----xx"
"x---x-----x"
"x---x-----xx"
"x-----x"
"x3-----xxx"
"xx--x21x--xx"
"xxxxxxxxxxxxx"
"
```

#### 5.4.5 stderr

part03test04.err

### 5.5 part03test05

#### 5.5.1 Diff

part03test05.diff

#### 5.5.2 Input File

part03test05.g

```
(
[
"xxxxxxxxxxxxx",
"x-x-x-----x",
"x--x-----x--x",
"xx-----x",
"x-----xx-x",
"x--x-xx-----x",
"x--2-----x",
"x-----x",
"x----3x-----x",
"x--g---1----x",
"x-----x-----x",
"x--x--xx---x",
"x-x-----xx",
"xxxxxxxxxxxxx"
],
[
"cc",
"cc",
"180"
]
)
```

### 5.5.3 Submission Output

part03test05.output

```
"Result "  
"xxxxxxxxxxxxxxxxxxx "  
"x-----xx "  
"x--x-----x "  
"x-x-x-----x "  
"x-----x-x "  
"x-----x-x "  
"x----x--x-x--x "  
"x----x-----x "  
"xxx-----x-x "  
"x----x---1---x "  
"xx-----xx "  
"x--x--2-3----x "  
"xxxxxxxxxxxxxxxxxxx "  
" "
```

### 5.5.4 Solution Output

part03test05.output

```
"Result "  
"xxxxxxxxxxxxxxxxxxx "  
"x-----xx "  
"x--x-----x "  
"x-x-x-----x "  
"x-----x-x "  
"x-----x-x "  
"x----x--x-x--x "  
"x----x-----x "  
"xxx-----x-x "  
"x----x---1---x "  
"xx-----xx "  
"x--x--2-3----x "  
"xxxxxxxxxxxxxxxxxxx "  
" "
```

### 5.5.5 stderr

part03test05.err

## 5.6 part03test06

### 5.6.1 Diff

part03test06.diff

### 5.6.2 Input File

part03test06.g

```
(  
[  
"xxxxxxxxxxxxxxxxxxxxxxxxxxx",  
"x-----x",  
"x--x-xx-----x--x",  
"x--xx---3--x-x-----x",  
"x-x2---1--x-xx-----x",  
"x-----x",  
]
```

```

"x-----x",
"x-----x",
"x-----x",
"xx---x--x--g---x",
"xxxxxxxxxxxxxxxxxxxx"
],
[
"180",
"c",
"180",
"cc",
"cc",
"180",
"c",
"c",
"cc",
"cc",
"c",
"c",
"cc"
]
)

```

### 5.6.3 Submission Output

part03test06.output

```

"Result "
"xxxxxxxxxxxx"
"x-----x"
"x-----x"
"x-----x"
"x-x---x--x"
"x-----3x"
"x--xx---x"
"x--x-x---x"
"x--x-----x"
"x--x---xxx"
"x-----x"
"x-----2x"
"x-x-----xx"
"x-x-----x"
"x--1-----x"
"x-xx-----x"
"x--x-----x"
"x--x-----x"
"x-----xx"
"xxxxxxxxxxxx"
"

```

### 5.6.4 Solution Output

part03test06.output

```

"Result "
"xxxxxxxxxxxx"
"x-----x"
"x-----x"
"x-----x"
"x-x---x--x"
"x-----3x"
"x--xx-----x"

```

```

"x---x-x---x"
"x--x-----x"
"x---x---xxx"
"x-----x"
"x-----2x"
"x-x-----xx"
"x-x-----x"
"x--1-----x"
"x-xx-----x"
"x--x-----x"
"x---x-----x"
"x-----xx"
"xxxxxxxxxxxx"
"

```

### 5.6.5 stderr

part03test06.err

## 5.7 part03test07

### 5.7.1 Diff

part03test07.diff

### 5.7.2 Input File

part03test07.g

```

(
[
"xxxxxxxxxxxxxxxxxxxxxx",
"x-----x---x-x-----x",
"xx--x-----xx---x-xx",
"xx-----x-g-x",
"x-----x-----xxx---x",
"x---x-----x-x",
"xx-----x--2-x--xx-x",
"x---x-----1----x---x",
"x-----x-----x--x",
"xx-----x",
"x-----x--x-x",
"x-----xxx-xx",
"x-----x---x-----x",
"x---x-----xx",
"x---xx-----x---x",
"xxxxxxxxxxxxxxxxxxxxxx"
],
[
"180",
"c",
"c",
"c",
"cc",
"cc",
"180",
"c",
"c",
"180",
"180",

```



```

"c",
"cc",
"c",
"cc",
"cc",
"180",
"c",
"180"
]
)

```

### 5.7.3 Submission Output

part03test07.output

```

"Result "
"xxxxxxxxxxxxxxxxxxxxx"
"x-x-----x-x-x"
"x--g-xx---x----x"
"x-x---x-x--x---x"
"x--xx--x---x--xx"
"xx--x-----xx---x"
"x---x-x-----x--x"
"xxx-----x"
"x-x-----x"
"x-----x-----x"
"x-----x"
"xx---x-----x-1x"
"x---x-----xx"
"x-----xx"
"x-x--x-x-----x-x"
"x-----x"
"x-----x"
"x-xx--x--x----2x"
"xxxxxxxxxxxxxxxxxxxxx"
"

```

### 5.7.4 Solution Output

part03test07.output

```

"Result "
"xxxxxxxxxxxxxxxxxxxxx"
"x-x-----x-x-x"
"x--g-xx---x----x"
"x-x---x-x--x---x"
"x--xx--x---x--xx"
"xx--x-----xx---x"
"x---x-x-----x--x"
"xxx-----x"
"x-x-----x"
"x-----x-----x"
"x-----x"
"xx---x-----x-1x"
"x---x-----xx"
"x-----xx"
"x-x--x-x-----x-x"
"x-----x"
"x-----x"
"x-xx--x--x----2x"
"xxxxxxxxxxxxxxxxxxxxx"
"

```

### 5.7.5 stderr

part03test07.err

## 5.8 part03test08

### 5.8.1 Diff

part03test08.diff

```
12 c 12
< "x-----1x---3x"
---
> "x-----21x---3x"
```

### 5.8.2 Input File

part03test08.g

```
(
[
"xxxxxxxxxxxxxxxx",
"x-----3--x",
"x-x-----x",
"x--xx--x---x",
"xx-----xx-x",
"x-----x---xx",
"x--x-----x-x",
"x2-----x--x",
"x-x-----x",
"x-----gx-x",
"x--x-----x",
"x-----x1-x-x",
"x-x-----x",
"xxxxxxxxxxxxxxxx",
],
[
"c",
"180",
"c",
"180",
"cc",
"cc",
"c",
"cc",
"180",
"cc",
"c",
"cc",
"c",
"cc",
]
)
```

### 5.8.3 Submission Output

part03test08.output

```
"Result "
"xxxxxxxxxxxxxxxx"
"x-----x---x"
"xx---x-----x-x"
```

```

"x--x---x--x--x"
"x-----x--x"
"x-----x"
"x-x-----x--x"
"x-----x--x"
"x---g-x--x--x"
"x-x-x--x-x--x"
"x-----1x---3x"
"xxxxxxxxxxxxxxxx"
"

```

## 5.8.4 Solution Output

part03test08.output

```

"Result"
"xxxxxxxxxxxxxxxx"
"x-----x--x"
"xx---x-----x-x"
"x--x---x--x--x"
"x-----x--x"
"x-----x"
"x-x-----x--x"
"x-----x--x"
"x---g-x--x--x"
"x-x-x--x-x--x"
"x-----21x---3x"
"xxxxxxxxxxxxxxxx"
"

```

## 5.8.5 stderr

part03test08.err

## 5.9 part03test09

### 5.9.1 Diff

part03test09.diff

### 5.9.2 Input File

part03test09.g

```

(
[
"xxxxxxxxxxxxxxxx",
"x-x2--x---xx",
"x---x---xx",
"x-----g--xxx",
"x-----x",
"x---x-----x",
"x---xx1----x",
"x-----x",
"x-----xx",
"x-x-----x-x",
"x-----x",
"x---x-----x",
"xxxxxxxxxxxxxxxx"
],
[

```

```
"cc"
]
)
```

### 5.9.3 Submission Output

part03test09.output

```
"Result "
"xxxxxxxxxxxxxxxxxx"
"xxxx-----x---x"
"x--x-----x--x"
"x-----x"
"x-----x"
"xx-g--1-----x"
"x-x--xx-----xx"
"x-----x-----x"
"x2-----x"
"xx-----x--x"
"x-----x"
"xxxxxxxxxxxxxxxxxx"
"
```

### 5.9.4 Solution Output

part03test09.output

```
"Result "
"xxxxxxxxxxxxxxxxxx"
"xxxx-----x---x"
"x--x-----x--x"
"x-----x"
"x-----x"
"xx-g--1-----x"
"x-x--xx-----xx"
"x-----x-----x"
"x2-----x"
"xx-----x--x"
"x-----x"
"xxxxxxxxxxxxxxxxxx"
"
```

### 5.9.5 stderr

part03test09.err

## 5.10 part03test10

### 5.10.1 Diff

part03test10.diff

### 5.10.2 Input File

part03test10.g

```
(
[
"xxxxxxxxxxxxxxxxxxxx",
"xx--x-----x-----x",
"x--x-1-x--x-----x",
"x-----x-----x",
```

```

"x-----x2----x----x",
"x-x-xx-----xx",
"x-----x",
"xx-----x-----x--x-x",
"x-----g-3-----x",
"xxxxxxxxxxxxxxxxxxxxx"
],
[
"cc",
"cc",
"c",
"c",
"c",
"c",
"c",
"c",
"180",
"cc",
"180",
"c"
]
)

```

### 5.10.3 Submission Output

part03test10.output

```

"Result "
"xxxxxxxxxxxxx"
"x----x---x"
"x-----x-x"
"x-----x"
"x-----x"
"x---x--x-x"
"x-----x"
"xxx-----x"
"x-----x"
"x-----x"
"x-x-2---3x"
"x--xx--x-x"
"x-----x"
"x-1--x---x"
"xxx--x---x"
"x-----x"
"x----x---x"
"xx-----x-x"
"xxxxxxxxxxxxx"
""

```

### 5.10.4 Solution Output

part03test10.output

```

"Result "
"xxxxxxxxxxxxx"
"x----x---x"
"x-----x-x"
"x-----x"
"x-----x"
"x---x--x-x"
"x-----x"
"xxx-----x"

```

```

"x-----x"
"x-----x"
"x-x-2---3x"
"x--xx--x-x"
"x-----x"
"x-1--x---x"
"xxx--x---x"
"x-----x"
"x----x---x"
"xx-----x-x"
"xxxxxxxxxxx"
" "

```

## 5.10.5 stderr

part03test10.err

## 5.11 part03test11

### 5.11.1 Diff

part03test11.diff

### 5.11.2 Input File

part03test11.g

```

(
[
"xxxxxxxxxxxxxxxx",
"x--x-xx-x--x-x",
"x-----x",
"x-xg-----x",
"xx----xx-----x",
"xx----xx-----x",
"x-----x",
"x-----1----x",
"x-----x-xx",
"x-x-----x",
"x--x-----x",
"x-----xx",
"x-x-----x",
"xx----x-2----x",
"xx----xx-----x",
"x-----x",
"x-----x",
"x----x-x-----x",
"xxxxxxxxxxxxxxxx"
],
[
"c",
"cc",
"cc",
"cc",
"c",
"c",
"180",
"c",
"180"
]
)

```

### 5.11.3 Submission Output

part03test11.output

```
"Result "  
"xxxxxxxxxxxxxxxxxxxxxx "  
"x---xx-----xx---x "  
"x-----x--x-----x--x "  
"x-----g-xx "  
"x-----x-----x "  
"xx-----xx "  
"x---x-----xx--xx "  
"xx-x-----xx--x "  
"x--x-----xx "  
"x-----x "  
"x-----x "  
"x-----xx "  
"x--2---x--x-1-----x "  
"xxxxxxxxxxxxxxxxxxxxxx "  
"
```

### 5.11.4 Solution Output

part03test11.output

```
"Result "  
"xxxxxxxxxxxxxxxxxxxxxx "  
"x---xx-----xx---x "  
"x-----x--x-----x--x "  
"x-----g-xx "  
"x-----x-----x "  
"xx-----xx "  
"x---x-----xx--xx "  
"xx-x-----xx--x "  
"x--x-----xx "  
"x-----x "  
"x-----x "  
"x-----xx "  
"x--2---x--x-1-----x "  
"xxxxxxxxxxxxxxxxxxxxxx "  
"
```

### 5.11.5 stderr

part03test11.err

## 5.12 part03test12

### 5.12.1 Diff

part03test12.diff

### 5.12.2 Input File

part03test12.g

```
(  
[  
"xxxxxxxxxxxxxx",  
"xx-----x",  
"x-----x",  
"x-x--x----x",
```

```

"x---x-----x",
"x---xx---x-x",
"x--x-x-----x",
"xg-----x-x",
"xxx--x-----x",
"x-----1-x",
"x2--x-x--xx",
"x-x-----x",
"x--x-----x",
"x-----x--x",
"x-----x",
"xxxxxxxxxxxxx",
],
[
"cc",
"c",
"c",
"c",
"180",
"c",
"c",
"cc",
"180",
"180",
"cc",
"cc"
]
)

```

### 5.12.3 Submission Output

part03test12.output

```

"Result "
"xxxxxxxxxxxxxxxxxxxxx"
"x-----x-----x"
"x---x-x-----x"
"x-----x-x"
"x-----x-----x"
"x--x-xx-x-----x"
"x---xx-----x-----x"
"x-----x-----x--x"
"x--x---x--x---x"
"xx-----gx1----2x"
"xxxxxxxxxxxxxxxxxxxxx"
"

```

### 5.12.4 Solution Output

part03test12.output

```

"Result "
"xxxxxxxxxxxxxxxxxxxxx"
"x-----x-----x"
"x---x-x-----x"
"x-----x-x"
"x-----x-----x"
"x--x-xx-x-----x"
"x---xx-----x-----x"
"x-----x-----x--x"
"x--x---x--x---x"
"xx-----gx1----2x"

```



```
"xxxxxxxxxxxxxxxxxxxxx"
"
```

### 5.12.5 stderr

part03test12.err

## 5.13 part03test13

### 5.13.1 Diff

part03test13.diff

```
10c10
< "x--x-----xxx---x"
---
> "x-2x-----xxx---x"
```

### 5.13.2 Input File

part03test13.g

```
(
[
"xxxxxxxxxxxxxxxxxxxxx",
"xx-xx-----x--x",
"x-----x-----x",
"xx----x----xx-----x",
"x-----1-----x",
"x---xxx-----x-x",
"xx2----xx-x-----x",
"x-----x-----x",
"x--x--3-----xxx---x",
"x----x--g-----x",
"xxxxxxxxxxxxxxxxxxxxx"
],
[
"cc",
"180",
"180",
"c",
"180",
"180",
"180",
"cc",
"180",
"c",
"c",
"cc",
"180",
"c",
"cc",
"180"
]
)
```

### 5.13.3 Submission Output

part03test13.output

```
"Result"
"xxxxxxxxxxxxxxxxxxxxx"
```

```

"xx-xx-----x--x"
"x1-----x-----x"
"xx----x----xx-----x"
"x-----x-----x"
"x---xxx-----x-x"
"xx-----xx-x-----x"
"x-----x-----x"
"x--x-----xxx---x"
"x-3--x--g-----x"
"xxxxxxxxxxxxxxxxxxxx"
" "

```

### 5.13.4 Solution Output

part03test13.output

```

"Result "
"xxxxxxxxxxxxxxxxxxxx"
"xx-xx-----x--x"
"x1-----x-----x"
"xx----x----xx-----x"
"x-----x-----x"
"x---xxx-----x-x"
"xx-----xx-x-----x"
"x-----x-----x"
"x-2x-----xxx---x"
"x-3--x--g-----x"
"xxxxxxxxxxxxxxxxxxxx"
" "

```

### 5.13.5 stderr

part03test13.err

## 5.14 part03test14

### 5.14.1 Diff

part03test14.diff

### 5.14.2 Input File

part03test14.g

```

(
[
"xxxxxxxxxxxxxxxxxxxx",
"xx---x-----x--x",
"x-----x-x",
"x---x-----x",
"x1--x---x-x-xx",
"x-----x",
"x-x-----x--x",
"x--x-----x-x-x",
"x-x----xx-----x",
"x--x-----x",
"x--x-----x",
"x---x--x---x-x",
"x-----x----2--x",
"xx---x-----x",
"x--xx-----x",

```

```

"x-g--x--x---x-x",
"x-----x",
"xxxxxxxxxxxxxxxxx"
],
[
"cc",
"c",
"cc",
"c",
"c",
"cc"
]
)

```

### 5.14.3 Submission Output

part03test14.output

```

"Result "
"xxxxxxxxxxxxxxxxx"
"xx---x-----x--x"
"x-----x-x"
"x---x-----x"
"x---x---x-x-xx"
"x-----x"
"x-x-----x--x"
"x--x-----x-x-x"
"x-x---xx-----x"
"x--x-----x"
"x--x-----x"
"x---x--x---x-x"
"x---1x-----x"
"xx---x-----x"
"x--xx-----x"
"x-g--x--x---x-x"
"x-----2x"
"xxxxxxxxxxxxxxxxx"
"

```

### 5.14.4 Solution Output

part03test14.output

```

"Result "
"xxxxxxxxxxxxxxxxx"
"xx---x-----x--x"
"x-----x-x"
"x---x-----x"
"x---x---x-x-xx"
"x-----x"
"x-x-----x--x"
"x--x-----x-x-x"
"x-x---xx-----x"
"x--x-----x"
"x--x-----x"
"x---x--x---x-x"
"x---1x-----x"
"xx---x-----x"
"x--xx-----x"
"x-g--x--x---x-x"
"x-----2x"
"xxxxxxxxxxxxxxxxx"

```

" "

### 5.14.5 stderr

part03test14.err

## 5.15 part03test15

### 5.15.1 Diff

part03test15.diff

```
20 c20
< "x2x3-----x"
---
> "x2x43-----x"
```

### 5.15.2 Input File

part03test15.g

```
(
[
"xxxxxxxxxxxxxxxxxxxxxxxx",
"x-----x----x----x",
"xx---x-----x-----x-x",
"x-----x-----xxx--xxx",
"x-xx----xx---1xx---x",
"x---x-----x-----x",
"x-----gx-----x--x",
"x-----2----x-x--x-x",
"x3--x4x-----x",
"xxxxxxxxxxxxxxxxxxxxxxxx",
],
[
"cc",
"c",
"cc",
"180",
"c",
"c",
"cc",
"c",
"c",
"c",
"180",
"cc",
"c",
"180",
"180"
]
)
```

### 5.15.3 Submission Output

part03test15.output

```
"Result "
"xxxxxxxxxxx"
"x--x-----x"
"x-xx---x-x"
"x-----x--x"
```

```

"x1--x----x"
"xx-xx--x-x"
"x--x-----x"
"x--x-x-x-x"
"x-x-----x"
"x-----x"
"xx--x-x--x"
"x--x-g--x"
"x-----x"
"x--x----xx"
"x-x-----x"
"x----x--xx"
"x--x----x"
"x--x----x"
"x2x3-----x"
"xxxxxxxxxxx"
" "

```

#### 5.15.4 Solution Output

part03test15.output

```

"Result "
"xxxxxxxxxxx"
"x--x-----x"
"x-xx--x-x"
"x-----x--x"
"x1--x----x"
"xx-xx--x-x"
"x--x-----x"
"x--x-x-x-x"
"x-x-----x"
"x-----x"
"xx--x-x--x"
"x--x-g--x"
"x-----x"
"x--x----xx"
"x-x-----x"
"x----x--xx"
"x--x----x"
"x--x----x"
"x2x43-----x"
"xxxxxxxxxxx"
" "

```

#### 5.15.5 stderr

part03test15.err

### 5.16 part03test16

#### 5.16.1 Diff

part03test16.diff

```

3c3,8
< "x--1x-----xxxx"
---
> "x-----x--x----x"
> "x--x-----x-x--x"
> "xxx-x-x-----x"

```

```

> "x-----x-1-----x"
> "xx---x-----x-x"
> "x-x2-----x"
5c10
< "x-----x-----x"
---
> "x-----x-----x"
7,12c12
< "x-----x-x"
< "x-x-----x---xx"
< "x-----g-x-----x"
< "x-----x-x-xxx"
< "x--x-x-----x--x"
< "x----x--x-----x"
---
> "xxxx-----x3--x"

```

### 5.16.2 Input File

part03test16.g

```

(
[
"xxxxxxxxxxxxxxxxxxxx",
"x---x-----xxxx",
"x--x-----x",
"x-----x-----x",
"x---2-----3x--x",
"x-----x-x",
"x-x-----x---xx",
"x---1-g-x-----x",
"x-----x-x-xxx",
"x--x-x-----x--x",
"x---x--x-----x",
"xxxxxxxxxxxxxxxxxxxx"
],
[
"cc",
"c",
"cc",
"cc",
"cc",
"180",
"cc",
"cc",
"cc",
"c",
"cc",
"180",
"180"
]
)

```

### 5.16.3 Submission Output

part03test16.output

```

"Result "
"xxxxxxxxxxxxxxxxxxxx"
"x--1x-----xxxx"
"x--x-----x"
"x-----x-----x"

```

```

"x-----x-x "
"x-----x-x "
"x-x-----x--xx "
"x-----g-x-----x "
"x-----x-x-xxx "
"x--x-x-----x--x "
"x----x--x-----x "
"xxxxxxxxxxxxxxxx "
" "

```

#### 5.16.4 Solution Output

part03test16.output

```

"Result "
"xxxxxxxxxxxxxxxx "
"x-----x--x-----x "
"x--x-----x-x--x "
"xxx-x-x-----x "
"x-----x-1-----x "
"xx---x-----x-x "
"x-x2-----x "
"x--x-----x "
"x-----x-----x "
"x-----x--x "
"xxxx-----x3--x "
"xxxxxxxxxxxxxxxx "
" "

```

#### 5.16.5 stderr

part03test16.err

### 5.17 part03test17

#### 5.17.1 Diff

part03test17.diff

```

11c11
< "x-----x-x "
---
> "x1-----x-x "

```

#### 5.17.2 Input File

part03test17.g

```

(
[
"xxxxxxxxxxxxxxxx ",
"x1-xxxx--x ",
"x-----x ",
"x-----x--x ",
"x--g-----x ",
"x-----x-x ",
"x-----x-x ",
"x----2xx--x ",
"x----xx--x ",
"x-----x-x ",
"xx-x----xxx ",
"x-----xxx ",

```

```

"x-x-----x",
"xxxxxxxxxxxx"
],
[
"cc",
"c",
"cc",
"180",
"180",
"180",
"cc",
"180",
"180",
"180",
"cc",
"180",
"c"
]
)

```

### 5.17.3 Submission Output

part03test17.output

```

"Result "
"xxxxxxxxxxxx"
"x--xxxx---x"
"x-----x"
"x-----x--x"
"x--g-----x"
"x-----x-x"
"x-----x-x"
"x-----xx--x"
"x-----xx--x"
"x-----x-x"
"xx-x----xxx"
"x-----xxx"
"x-x----2--x"
"xxxxxxxxxxxx"
"

```

### 5.17.4 Solution Output

part03test17.output

```

"Result "
"xxxxxxxxxxxx"
"x--xxxx---x"
"x-----x"
"x-----x--x"
"x--g-----x"
"x-----x-x"
"x-----x-x"
"x-----xx--x"
"x-----xx--x"
"x1-----x-x"
"xx-x----xxx"
"x-----xxx"
"x-x----2--x"
"xxxxxxxxxxxx"
"

```



### 5.17.5 stderr

part03test17.err

## 5.18 part03test18

### 5.18.1 Diff

part03test18.diff

```
11 c11
< "x2-----x"
---
> "x2-1-----x"
```

### 5.18.2 Input File

part03test18.g

```
(
[
"xxxxxxxxxxxxxxxxxxxx",
"x-x--1-----xx",
"x----xx-----x",
"x-----x",
"x-x--x---x--x--x",
"x-x----x--x--x-x",
"x---xg----xx---x",
"x-x4-----x",
"x-----x",
"x-----2-----x",
"xx---3--x-----x",
"xxxxxxxxxxxxxxxxxxxx",
],
[
"cc",
"c"
]
)
```

### 5.18.3 Submission Output

part03test18.output

```
"Result"
"xxxxxxxxxxxxxxxxxxxx"
"x-x-----xx"
"x----xx-----x"
"x-----x"
"x-x--x---x--x--x"
"x-x----x--x--x-x"
"x---xg----xx---x"
"x-x-----x"
"x-----x"
"x2-----x"
"xx34----x-----x"
"xxxxxxxxxxxxxxxxxxxx"
"
```

### 5.18.4 Solution Output

part03test18.output

```
"Result "  
"xxxxxxxxxxxxxxxxxxxxx "  
"x-x-----xx "  
"x---xx-----x "  
"x-----x "  
"x-x--x---x--x--x "  
"x-x-----x--x--x-x "  
"x---xg-----xx---x "  
"x-x-----x "  
"x-----x "  
"x2-1-----x "  
"xx34-----x-----x "  
"xxxxxxxxxxxxxxxxxxxxx "  
"
```

#### 5.18.5 stderr

part03test18.err

### 5.19 part03test19

#### 5.19.1 Diff

part03test19.diff

```
11,12c11,12  
< "x--g--x--x--x "  
< "x-3-----x-x "  
---  
> "x-3g--x--x--x "  
> "x-2-----x-x "
```

#### 5.19.2 Input File

part03test19.g

```
(  
[  
"xxxxxxxxxxxxxxxxxxxxx ",  
"x----x-----x ",  
"x----x----x----xx ",  
"x--1x----x-----x ",  
"x-----xxx-----x ",  
"x-----x--x ",  
"x--x----x-----4x ",  
"x-----x--x ",  
"x-----x ",  
"xxx--x--xg-----x ",  
"x--x32-----x-----x ",  
"x-----x-----x ",  
"xxxxxxxxxxxxxxxxxxxxx "  
],  
[  
"cc",  
"180"  
]  
)
```

#### 5.19.3 Submission Output

part03test19.output

```
"Result "  
"xxxxxxxxxxxxxxxxx "  
"x--x-----x "  
"x--x-----x "  
"x-----1--x "  
"x-x---x--x--x "  
"x--x-----xxx "  
"xx-----x---x "  
"x-----x---x "  
"x--x---x---x "  
"x--g--x--x--x "  
"x-3-----x-x "  
"x-x-----x "  
"x-----x "  
"x----x-x---x "  
"x-----x "  
"x-----4---x-x "  
"xxxxxxxxxxxxxxxxx "  
"
```

#### 5.19.4 Solution Output

part03test19.output

```
"Result "  
"xxxxxxxxxxxxxxxxx "  
"x--x-----x "  
"x--x-----x "  
"x-----1--x "  
"x-x---x--x--x "  
"x--x-----xxx "  
"xx-----x---x "  
"x-----x---x "  
"x--x---x---x "  
"x-3g--x--x--x "  
"x-2-----x-x "  
"x-x-----x "  
"x-----x "  
"x----x-x---x "  
"x-----x "  
"x-----4---x-x "  
"xxxxxxxxxxxxxxxxx "  
"
```

#### 5.19.5 stderr

part03test19.err

### 5.20 part03test20

#### 5.20.1 Diff

part03test20.diff

```
7 c7  
< "x-----x---x "  
---  
> "x---1--x---x "  
15 c15  
< "x--g--x-----x "
```

```

---
> "x--3--x----2x"
19c19
< "xxx-----2x--xx"
---
> "xxx-----x--xx"

```

## 5.20.2 Input File

part03test20.g

```

(
[
"xxxxxxxxxxxxxxxxxxxxxx",
"xx--1-----x-xxx",
"x--x-----2x",
"x-----x-----x",
"x-----xx",
"x--x--x-----x",
"xx--x--x--x--x",
"x--x--3-xx--xx-x",
"x--xx-----x",
"x-x-----g-----x",
"xx--x-----x--xx",
"x-----x-----xx",
"xxxxxxxxxxxxxxxxxxxxxx"
],
[
"180",
"c",
"c",
"180",
"c",
"c",
"c",
"c",
"c",
"c",
"cc",
"180",
"c",
"c",
"c",
"c",
"180",
"c",
"180",
"cc",
"c"
]
)

```

## 5.20.3 Submission Output

part03test20.output

```

"Result "
"xxxxxxxxxxxxxxxxxxxxxx"
"x-x--x-----xx"
"x--x-----x"
"x-----x-x"
"x-x-----x"
"x-----x--x"

```

```

"x---xxx-----x"
"x---x-----x"
"x-----x"
"xx---x-----x"
"x-----x--x"
"x---x-x-----x"
"x---x-----x"
"x--g--x-----x"
"x-x-----xx"
"x---x-----x"
"x---x-----xx"
"xxx---2x--xx"
"xxxxxxxxxxxxxx"
"

```

## 5.20.4 Solution Output

part03test20.output

```

"Result"
"xxxxxxxxxxxxxx"
"x-x---x-----xx"
"x--x-----x"
"x-----x-x"
"x-x-----x"
"x---1--x-----x"
"x---xxx-----x"
"x---x-----x"
"x-----x"
"xx---x-----x"
"x-----x--x"
"x---x-x-----x"
"x---x-----x"
"x--3--x---2x"
"x-x-----xx"
"x---x-----x"
"x---x-----xx"
"xxx---x--xx"
"xxxxxxxxxxxxxx"
"

```

## 5.20.5 stderr

part03test20.err

## 5.21 part03test21

### 5.21.1 Diff

part03test21.diff

### 5.21.2 Input File

part03test21.g

```

(
[
"xxxxxxxxxxxxxx",
"x-----x",
"x-----x--xx",
"x--x-----x",

```

```

"x----x-xxx-xx",
"x-----x",
"x---g--x---x",
"x--x---x-x-x",
"x-x-----x-xx",
"x--x-----x",
"x---x---1--x",
"x---2-----x",
"x-----x",
"xxxxxxxxxxxxxxxx",
],
[
"180",
"cc"
]
)

```

### 5.21.3 Submission Output

part03test21.output

```

"Result "
"xxxxxxxxxxxxxxxx"
"x-----x"
"x---x-----x"
"x--x-x---x--x"
"x-----x"
"x--x---g-x---x"
"x-----x"
"x-----x---x"
"x-----xx-x-x-x"
"x---x---x---x"
"x---x-----x"
"x-2-1x---x-x-x"
"xxxxxxxxxxxxxxxx"
" "

```

### 5.21.4 Solution Output

part03test21.output

```

"Result "
"xxxxxxxxxxxxxxxx"
"x-----x"
"x---x-----x"
"x--x-x---x--x"
"x-----x"
"x--x---g-x---x"
"x-----x"
"x-----x---x"
"x-----xx-x-x-x"
"x---x---x---x"
"x---x-----x"
"x-2-1x---x-x-x"
"xxxxxxxxxxxxxxxx"
" "

```

### 5.21.5 stderr

part03test21.err

## 5.22 part03test22

### 5.22.1 Diff

part03test22.diff

### 5.22.2 Input File

part03test22.g

```
(  
[  
"xxxxxxxxxxxxxxxx",  
"x--x-----x-x",  
"x--x-----x",  
"x-----x--x",  
"x-----x",  
"x-----x--x",  
"xx-----x-x",  
"x--x--2----x",  
"xg-----x--x",  
"x---x--1-x-x",  
"x-----x-x",  
"x--x-----x",  
"x-xx-----xx",  
"x-x--x-----x",  
"x-----xx",  
"xxxxxxxxxxxxxxxx",  
],  
[  
"180",  
"c",  
"180",  
"180",  
"c",  
"c",  
"180",  
"cc",  
"cc",  
"180",  
"cc",  
"cc",  
"c",  
"cc",  
"c",  
"cc",  
"c",  
"cc",  
"c",  
"180",  
"180"  
]  
)
```

### 5.22.3 Submission Output

part03test22.output

```
"Result "  
"xxxxxxxxxxxxxxxx"  
"x-----x-xx"  
"xx----x--xx----x"  
"x--x----x-----x"
```

```
"x----x-----x"
"x-----x"
"x-----x-x"
"x-----x-----x"
"xxx----x---xx--x"
"x-----xx-x"
"x-----x-2--1---x"
"xxxxxxxxxxxxxxxx"
"
```

## 5.22.4 Solution Output

part03test22.output

```
"Result"
"xxxxxxxxxxxxxxxx"
"x-----x-xx"
"xx----x--xx----x"
"x--x----x-----x"
"x----x-----x"
"x-----x"
"x-----x-x"
"x-----x-----x"
"xxx----x---xx--x"
"x-----xx-x"
"x-----x-2--1---x"
"xxxxxxxxxxxxxxxx"
"
```

## 5.22.5 stderr

part03test22.err

## 5.23 part03test23

### 5.23.1 Diff

part03test23.diff

```
3,5c3,5
< "x-----x"
< "x-x-----x-x"
< "x2-----x"
---
> "x43-----x"
> "x2x-----x-x"
> "x1-----x"
```

### 5.23.2 Input File

part03test23.g

```
(
[
"xxxxxxxxxxxxxxxx",
"x-4-3-----x",
"x-x--2--x-x",
"x-----x",
"xxx-----x",
"x-x1-----x",
"x-----x",
"x---g-----x",
```



```

"x--x-x----x",
"x--x-x----x",
"xxxxxxxxxxxx"
],
[
"c",
"c",
"cc",
"c",
"cc",
"c",
"cc",
"c",
"cc",
"180",
"c",
"c",
"c",
"c",
"180",
"c",
"cc",
"180",
"180",
"c",
"c"
]
)

```

### 5.23.3 Submission Output

part03test23.output

```

"Result "
"xxxxxxxxxxxx"
"x-----x"
"x-x-----x-x"
"x2-----x"
"xxx-----x"
"x-x-----x"
"x-----x"
"x---g-----x"
"x--x-x-----x"
"x--x-x-----x"
"xxxxxxxxxxxx"
"

```

### 5.23.4 Solution Output

part03test23.output

```

"Result "
"xxxxxxxxxxxx"
"x43-----x"
"x2x-----x-x"
"x1-----x"
"xxx-----x"
"x-x-----x"
"x-----x"
"x---g-----x"
"x--x-x-----x"
"x--x-x-----x"
"xxxxxxxxxxxx"

```

""

### 5.23.5 stderr

part03test23.err

## 5.24 part03test24

### 5.24.1 Diff

part03test24.diff

```
14c14
< "x3-----x41-----x"
---
> "x23-----x41-----x"
```

### 5.24.2 Input File

part03test24.g

```
(
[
"xxxxxxxxxxxxxxxxxx",
"x-----x",
"x-x----x-x2--x",
"x--xx---x---xx",
"x-x----x-----x",
"x-----x",
"x-----x",
"x-----x-x-----x",
"x--x-----g-xxx",
"x-----x3-x-x",
"xx--x-x-----x",
"x-xx--x-----x",
"x----x----x--x",
"x-4---x-----xx",
"x-1--x-----x",
"x-----x-x-x",
"x-----x",
"x-----x--x--x",
"x-x-----x",
"xxxxxxxxxxxxxxxxxx"
],
[
"c",
"cc",
"c",
"180",
"cc",
"180",
"180",
"c",
"180",
"180",
"cc",
"c"
]
)
```

### 5.24.3 Submission Output

```

"Result "
"xxxxxxxxxxxxxxxxxxxxxxxxx "
"x--x----x----x-----x "
"x-----xx-----x---x "
"x-----x-----x-x "
"x-x-----g-----x---x "
"x--x---x-x-----x "
"x-x-x-----x-x "
"x-----x--xx-x-----x "
"x-----x-x-----x "
"x--x-----x-----x "
"x--x---x--x-----x "
"x-x-x-----x-----xx "
"x3-----x41-----x "
"xxxxxxxxxxxxxxxxxxxxxxxxx "
"

```

#### 5.24.4 Solution Output

```

"Result "
"xxxxxxxxxxxxxxxxxxxxxxxxx "
"x--x----x----x-----x "
"x-----xx-----x---x "
"x-----x-----x-x "
"x-x-----g-----x---x "
"x--x---x-x-----x "
"x-x-x-----x-x "
"x-----x--xx-x-----x "
"x-----x-x-----x "
"x--x-----x-----x "
"x--x---x--x-----x "
"x-x-x-----x-----xx "
"x23-----x41-----x "
"xxxxxxxxxxxxxxxxxxxxxxxxx "
"

```

#### 5.24.5 stderr

### 5.25 part03test25

#### 5.25.1 Diff

```

2,15c2,16
< "xxxxxxxxxxxxxxxxxxxxx "
< "x--x--x----x-x "
< "x-x-----x--x "
< "x-----x-x--x "
< "x--x-2-----xx "
< "x----x-----x "
< "x----x-----x "
< "xx-----x "
< "x-xx---x--x--x "
< "x-----x "
< "x-x---x-----x "

```

```

< "xx-----g--x"
< "x-----x-----x"
< "xxxxxxxxxxxxxxxxxx"
---
> "xxxxxxxxxxxxxxxxxx"
> "x---x-----x"
> "xx-----x"
> "x-xx-----2-x"
> "x-----x-----x"
> "x--x-----x"
> "x-----1x"
> "xx-----x---xx"
> "x-----x--x"
> "x----xx-----x"
> "xx-----x"
> "x---x---x-----x"
> "x-x-----x-x--x"
> "x-----x---x-x"
> "xxxxxxxxxxxxxxxxxx"

```

## 5.25.2 Input File

part03test25.g

```

(
[
"xxxxxxxxxxxxxxxxxx",
"x-----x-----x",
"x--g-----xx",
"x-----x---x-x",
"x-----x",
"x---x--x---xx-x",
"x-----1---xx",
"x---2---x-----x",
"x-----x-----x",
"xx-----x--x",
"x--x-x-----x",
"x--x-----x-x",
"x-x---x--x---x",
"xxxxxxxxxxxxxxxxxx"
],
[
"cc",
"cc",
"c",
"180",
"180",
"cc",
"c",
"c",
"c",
"180",
"c",
"c",
"cc",
"c",
"180",
"c",
"c",
"cc",
"c",
"180",
"c",
"c",
"c"
]
)

```

)

### 5.25.3 Submission Output

part03test25.output

```
"Result "  
"xxxxxxxxxxxxxxxxxxx "  
"x---x--x----x-x "  
"x-x-----x--x "  
"x-----x-x--x "  
"x--x-2-----xx "  
"x----x-----x "  
"x----x-----x "  
"xx-----x "  
"x-xx---x--x--x "  
"x-----x "  
"x-x---x-----x "  
"xx-----g--x "  
"x-----x-----x "  
"xxxxxxxxxxxxxxxxxxx "  
" "
```

### 5.25.4 Solution Output

part03test25.output

```
"Result "  
"xxxxxxxxxxxxxxxxxxx "  
"x---x-----x "  
"xx-----x "  
"x-xx-----2-x "  
"x-----x-----x "  
"x--x-----x "  
"x-----1x "  
"xx-----x---xx "  
"x-----x--x "  
"x----xx-----x "  
"xx-----x "  
"x---x---x-----x "  
"x-x-----x-x--x "  
"x-----x---x-x "  
"xxxxxxxxxxxxxxxxxxx "  
" "
```

### 5.25.5 stderr

part03test25.err

## 5.26 part03test26

### 5.26.1 Diff

part03test26.diff

### 5.26.2 Input File

part03test26.g

```
(  
[  
"xxxxxxxxxxxxxxxxxxx",  

```

```

"x-----x-xx--xx",
"x-----x",
"x----x-----x",
"x-----x-1x",
"x-----x----x",
"x-x-x-----x",
"x-----x-x",
"x-----xx",
"x--3x--x-----x",
"xx-----x----xx",
"x-x-----x---xx",
"x-----2---gx",
"x-----x",
"x--x--x-----x",
"x--x-x--x---x",
"xxxxxxxxxxxxxxxx"
],
[
"cc",
"180",
"180",
"180",
"180",
"180"
]
)

```

### 5.26.3 Submission Output

part03test26.output

```

"Result "
"xxxxxxxxxxxxxxxxxxxxx"
"x-----x-----x"
"x-----x---x-----x"
"x-x---3-----x"
"xx-----x--x-----x"
"x-----x--x"
"xxx-----xx"
"x-----xx-----x"
"x-----x-----xx"
"xx-----xx"
"x-----x--x"
"x-----x-----x"
"x---2xx-x---1--xx"
"xxxxxxxxxxxxxxxxxxxxx"
"

```

### 5.26.4 Solution Output

part03test26.output

```

"Result "
"xxxxxxxxxxxxxxxxxxxxx"
"x-----x-----x"
"x-----x---x-----x"
"x-x---3-----x"
"xx-----x--x-----x"
"x-----x--x"
"xxx-----xx"
"x-----xx-----x"
"x-----x-----xx"

```

```
"xx-----xx"
"x-----x--x"
"x-----x-----x"
"x---2xx-x---1--xx"
"xxxxxxxxxxxxxxxxxx"
"
```

## 5.26.5 stderr

part03test26.err

## 5.27 part03test27

### 5.27.1 Diff

part03test27.diff

```
10,11c10,11
< "x-----1----x----x"
< "x-----4---x-----x"
---
> "x-----4----x----x"
> "x-----1---x-----x"
```

### 5.27.2 Input File

part03test27.g

```
(
[
"xxxxxxxxxxxxxxxxxx",
"xx-----x-x",
"x---x-xx-----x",
"x-----x-xx",
"x-----x--x",
"x--x----x----x",
"x---x----x-xxx",
"x----x---3-x-x",
"x----x-----x",
"x-----xxx",
"x----4--1g--xx",
"xx-----x",
"x-----x-x",
"x--x-----x-x",
"x-----x--x",
"x-----x--x",
"x--2-x-x-----x",
"x----x-----x",
"xx-----x",
"xxxxxxxxxxxxxxxxxx"
],
[
"c",
"c",
"180",
"c",
"180",
"cc",
"cc",
"c",
"180",
```

```
"c",
"cc",
"cc",
"180",
"c",
"c",
"180",
"cc",
"180",
"180"
]
)
```

### 5.27.3 Submission Output

part03test27.output

```
"Result "
"xxxxxxxxxxxxxxxxxxxxxxxx "
"xx-----x-----xx "
"x-----x "
"x-----x-----x-----x "
"x--2-----x--x-x "
"x--x-----xx-----x "
"x-x-----x-x "
"x--x-----x-x "
"x-----1-----x-----x "
"x-----4---x-----x "
"x---xx-----3--xx--x "
"x-----xx--x-xx-----xx "
"x-----xx--x--x--x "
"xxxxxxxxxxxxxxxxxxxxxxxx "
"
```

### 5.27.4 Solution Output

part03test27.output

```
"Result "
"xxxxxxxxxxxxxxxxxxxxxxxx "
"xx-----x-----xx "
"x-----x "
"x-----x-----x-----x "
"x--2-----x--x-x "
"x--x-----xx-----x "
"x-x-----x-x "
"x--x-----x-x "
"x-----4---x-----x "
"x-----1---x-----x "
"x---xx-----3--xx--x "
"x-----xx--x-xx-----xx "
"x-----xx--x--x--x "
"xxxxxxxxxxxxxxxxxxxxxxxx "
"
```

### 5.27.5 stderr

part03test27.err

## 5.28 part03test28

### 5.28.1 Diff



part03test28.diff

```
12 c12
< "x-x-x-----x"
---
> "x-x-x-----1---x"
18 c18
< "x-----1x-x---x"
---
> "x-----2x-x3---x"
```

## 5.28.2 Input File

part03test28.g

```
(
[
"xxxxxxxxxxxxxxxxxxxxxx",
"x-x-----x",
"x-----x-----x-x",
"x-x-----xx",
"x-----x-----x",
"x-----x-----x",
"x--x-----x-x-----x",
"x-x-----x-x",
"x--2--x-----x-----x",
"xx-----x-----x",
"x-----x-----x",
"xxx-x-x3-----1--x",
"x-----x--x",
"x--x-----gx",
"x--x-----x-----x",
"xxxxxxxxxxxxxxxxxxxxxx"
],
[
"cc",
"180",
"180",
"cc",
"c",
"c",
"180",
"cc",
"180",
"cc",
"cc",
"cc",
"cc",
"cc",
"cc",
"cc",
"cc",
"180",
"180",
"cc"
]
)
```

## 5.28.3 Submission Output

part03test28.output

```
"Result "
"xxxxxxxxxxxxxxxxxxxxxx"
"x--x-----g-x"
"x-----x-----x"
```

```

"x-----x--x "
"x-x-----x "
"x-----x "
"x-----x-x-----xx "
"x-----x-----x "
"x-----x--x-----x "
"x-----x-----x "
"x-x-x-----x "
"x-----x--x-----x "
"x-----x "
"x-----x-----x "
"x-----x-----xxx "
"xx-x--x--x--x--x "
"x-----1x-x--x "
"xxxxxxxxxxxxxxxx "
" "

```

## 5.28.4 Solution Output

part03test28.output

```

"Result "
"xxxxxxxxxxxxxxxx "
"x--x-----g-x "
"x-----x-----x "
"x-----x--x "
"x-x-----x "
"x-----x "
"x-----x-x-----xx "
"x-----x-----x "
"x-----x--x-----x "
"x-----x-----x "
"x-x-x-----1---x "
"x-----x--x--x "
"x-----x "
"x-----x--x "
"x-----x-----xxx "
"xx-x--x--x--x--x "
"x-----2x-x3--x "
"xxxxxxxxxxxxxxxx "
" "

```

## 5.28.5 stderr

part03test28.err

## 5.29 part03test29

### 5.29.1 Diff

part03test29.diff

```

11,12c11,12
< "x--x---x-----x "
< "x-----1--x----2-x "
---
> "x--x--1x-----x "
> "x-----3--x----2-x "

```

### 5.29.2 Input File

```
(
[
"xxxxxxxxxxxxxxxx",
"x-----x---x",
"x-----x",
"x-x-x----x-x",
"x-----x",
"x--xx-----xx",
"x--3--1----x",
"x-x-----xx",
"x----x-----x",
"xx-----x",
"x-----x--x",
"x---xxx--x-x",
"x---xg--4--x",
"x-----x",
"x-----2x-x",
"x----x-----x",
"xxxxxxxxxxxxxxxx",
],
[
"c",
"180",
"cc",
"cc",
"cc",
"c",
"180",
"cc",
"180",
"c",
"cc",
"180",
"c",
"c",
"c",
"c",
"180",
"cc"
]
)
```

### 5.29.3 Submission Output

```
"Result "
"xxxxxxxxxxxxxxxx"
"x----x-x-----x"
"x--x-----x--x-x"
"x-----x-----x"
"xx-----x"
"x-----x-----x"
"x-----x--x4--xx"
"x--x-x-----xx---x"
"x----x-----x"
"x--x---x-----x"
"x-----1--x----2-x"
"xxxxxxxxxxxxxxxx"
"
```

## 5.29.4 Solution Output

part03test29.output

```
"Result "  
"xxxxxxxxxxxxxxxxxxxxx "  
"x----x-x-----x "  
"x--x-----x--x-x "  
"x-----x-----x "  
"xx-----x "  
"x-----x----x "  
"x-----x--x4--xx "  
"x--x-x-----xx--x "  
"x----x-----x "  
"x--x--1x-----x "  
"x-----3--x----2-x "  
"xxxxxxxxxxxxxxxxxxxxx "  
"
```

## 5.29.5 stderr

part03test29.err

## 5.30 part03test30

### 5.30.1 Diff

part03test30.diff

```
15,16c15,16  
< "x----x-----xx "  
< "x3-x-----x2--x "  
---  
> "x3---x-----xx "  
> "x1-x-----x2--x "
```

### 5.30.2 Input File

part03test30.g

```
(  
[  
"xxxxxxxxxxxxxxxxxxxxx",  
"x--1-x--x--x-x-x",  
"x-----2-x",  
"x-----x-xxx----x",  
"x3-----xx",  
"x-g---x-----x",  
"x-----xx-x-----x",  
"x----x---x-----x",  
"x-----xx-x-x",  
"xx-----x---x",  
"x-----xx",  
"x-----x--x-x--x",  
"x-----x",  
"xxxxxxxxxxxxxxxxxxxxx"  
],  
[  
"180",  
"cc",  
"c",  
"cc",
```

```

"cc",
"180",
"180",
"c",
"cc",
"c",
"cc",
"180",
"180",
"c"
]
)

```

### 5.30.3 Submission Output

part03test30.output

```

"Result "
"xxxxxxxxxxxxxxxxxxx "
"x---x-----x "
"x-----g----x "
"x-----x "
"x-----x "
"x-----x "
"x-----x--xx "
"x-----xx-x--x "
"x-x---x-----x "
"x-----x-xx "
"x-----xx--x--x "
"x-x--x-----x--x "
"x--xx-----xx "
"x-x-----x "
"x---x-----xx "
"x3-x-----x2--x "
"xxxxxxxxxxxxxxxxxxx "
" "

```

### 5.30.4 Solution Output

part03test30.output

```

"Result "
"xxxxxxxxxxxxxxxxxxx "
"x---x-----x "
"x-----g----x "
"x-----x "
"x-----x "
"x-----x--xx "
"x-----xx-x--x "
"x-x---x-----x "
"x-----x-xx "
"x-----xx--x--x "
"x-x--x-----x--x "
"x--xx-----xx "
"x-x-----x "
"x3---x-----xx "
"x1-x-----x2--x "
"xxxxxxxxxxxxxxxxxxx "
" "

```

### 5.30.5 stderr

part03test30.err

## 5.31 Source Code

csce322hw03pt03.hs

```
1 import Prelude
2 import System.Environment ( getArgs )
3 import Data.List
4 import Data.Char
5 import Helpers
6
7 -- The main method that will be used for testing / command line access
8 main = do
9   args <- getArgs
10  filename <- readFile (head args)
11  (maze,moves) <- readGravityMazeFile filename
12  print "Result"
13  printMaze (manyPlayersManyRotations maze moves)
14
15 -- YOUR CODE SHOULD COME AFTER THIS POINT
16 manyPlayersManyRotations :: [[Char]] -> [[Char]] -> [[Char]]
17 manyPlayersManyRotations maze [] = maze
18 manyPlayersManyRotations [] _ = []
19 manyPlayersManyRotations maze (move:moves)
20   | (not (hasgoal maze)) = maze -- if goal is encountered, players make none of the
    remaining moves
21   | otherwise            = manyPlayersManyRotations (
    manyPlayersManyRotationswithOneMove maze move) moves
22 -- 1st move for player1, 2nd move for player 2... accordance to onePlayerOneRotation
23 -- when a player makes a move, all of the other players are also fall until they stop
24 manyPlayersManyRotationswithOneMove :: [[Char]] -> [Char] -> [[Char]]
25 manyPlayersManyRotationswithOneMove maze move
26   | (move == "c") = getMultiPlayerClockwise maze
27   | (move == "cc") = getMultiPlayerCClockwise maze
28   | (move == "180") = getMultiPlayerFlipwise maze
29   | otherwise      = maze
```

# Chapter 6

## Helpers.hs

### 6.1 Source Code

Helpers.hs

```
1 module Helpers
2 (
3   readGravityMazeFile ,
4   printMaze ,
5   printMove ,
6   replace1DListAtIndex ,
7   replace2DListAtIndex ,
8   moveUp ,
9   moveRight ,
10  -----
11  moveLeft ,
12  clear1dPlayerPerviousPosition ,
13  clearPlayerPerviousPosition ,
14  member ,
15  isPlayer ,
16  append1dListRowWise ,
17  getPlayerMoveLeftResult ,
18  getPlayerMoveRightResult ,
19  getPlayerMoveUpResult ,
20  append1dListTo2dListRowWise ,
21  movePlayerLeftBeforeRotate ,
22  movePlayerRightBeforeRotate ,
23  mazeBeforeRotateMovePlayerLeft ,
24  mazeBeforeRotateMovePlayerRight ,
25  getColumn ,
26  backward ,
27  cclockwiseMaze ,
28  clockwiseMaze ,
29  flipwiseMaze ,
30  clockwiseMazeResult ,
31  -----
32  cclockwiseMazeResult ,
33  flipMazewithouIndexAsInput ,
34  -----
35  find1dPlayerPosition ,
36  find2dPlayerPostion ,
37  clockwiseMazewithoutPlayerIndexAsInput ,
38  -----
39  cclockwiseMazewithoutPlayerIndexAsInput ,
40  -----
41  hasgoalLine ,
```

```

42 hasgoal,
43 findPlayers,
44 -----
45 find2dMultiPlayersPostion,
46 multiPlayerMoveUp,
47 multiPlayerMoveLeft,
48 multiPlayerMoveRight,
49 getMultiPlayerMoveLeftResult,
50 getMultiPlayerMoveRightResult,
51 getMultiPlayerMoveUpResult,
52 intToChar,
53 getMultiPlayerClockwise,
54 getMultiPlayerCClockwise,
55 getMultiPlayerFlipwise
56 )
57 where
58   import Prelude
59   import Data.Char
60   import Data.List
61   -----
62   readGravityMazeFile :: String -> IO ([[Char]], [[Char]])
63   readGravityMazeFile = readIO
64   -----
65   printMaze :: [[Char]] -> IO ()
66   printMaze [] = do
67     print ""
68   printMaze (ro:ros) = do
69     print ro
70     printMaze ros
71   -----
72   printMove :: [[Char]] -> IO ()
73   printMove [] = do
74     print ""
75   printMove (h:rest) = do
76     print h
77     printMove rest
78   -----
79   replace1DListAtIndex :: [Char] -> Int -> Char -> [Char] -- WORK
80   replace1DListAtIndex "" _ _ = ""
81   replace1DListAtIndex [e1] 0 e2 = [e2]
82   replace1DListAtIndex list n e2
83   | list !! n == e2 = list
84   | otherwise      = take n list ++ [e2] ++ drop (n + 1) list
85   -----
86   replace2DListAtIndex :: [[Char]] -> Int -> Int -> Char -> [[Char]] -- WORK
87   replace2DListAtIndex ["" ] _ _ _ = ["" ]
88   replace2DListAtIndex (row:rest) r c e
89   | (r==0)      = [replace1DListAtIndex row c e] ++ rest
90   | otherwise = [row] ++ replace2DListAtIndex rest (r - 1) c e
91   -----
92   moveUp :: [[Char]] -> Int -> Int -> Char -> [[Char]] --WORK
93   moveUp [] _ _ _ = []
94   moveUp [d1list] _ _ _ = [d1list]
95   moveUp maze x y player
96   | ((maze !! (x-1) !! y /= 'x') && (maze !! (x-1) !! y /= 'g'))= moveUp maze (x-1) y
97   | (maze !! (x-1) !! y == 'g') = replace2DListAtIndex maze (x-1) y player -- meet
98   | otherwise                    = replace2DListAtIndex maze x y player
99   -----

```



```

100 moveRight :: [Char] -> Int -> Char ->[Char] --WORK
101 moveRight [] _ _ = []
102 moveRight [e] _ _ = [e]
103 moveRight list n player
104 | ((list !! (n+1) /= 'x') && (list !! n /= 'g')) = moveRight list (n+1) player --
    Not 'x', not 'g' so can moveright
105 | otherwise                                     = replace1DListAtIndex list n
    player
106 -----
107 moveLeft :: [Char] -> Int -> Char ->[Char] --WORK
108 moveLeft [] _ _ = []
109 moveLeft [e] _ _ = [e]
110 moveLeft list n player
111 | ((list !! (n-1) /= 'x') && (list !! n /= 'g')) = moveLeft list (n-1) player
112 | otherwise                                     = replace1DListAtIndex list n
    player
113 -----
114 clear1dPlayerPerviousPosition :: [Char] -> Int -> [Char] -- WORK
115 clear1dPlayerPerviousPosition maze i = replace1DListAtIndex maze i '-'
116 -----
117 clearPlayerPerviousPosition :: [[Char]] -> Int -> Int -> [[Char]] -- WORK
118 clearPlayerPerviousPosition maze x y = replace2DListAtIndex maze x y '-'
119 -----
120 member :: Eq a => a -> [a] -> Bool -- WORK
121 member _ [] = False
122 member e (h:t) = e == h || (member e t)
123 -----
124 isPlayer :: Char -> Bool -- WORK
125 isPlayer letter = (member letter "0123456789")
126 -----
127 append1dListRowWise :: [Char] -> [Char] -> [[Char]] -- WORK
128 append1dListRowWise row1 row2 = [row1] ++ [row2]
129 -----
130 getPlayerMoveLeftResult :: [Char] -> Int -> Char-> [Char] -- WORK
131 getPlayerMoveLeftResult line n player
132 | (line !! (n-1) /= 'x') = clear1dPlayerPerviousPosition (moveLeft line n player) n
133 | otherwise               = line
134 -----
135 getPlayerMoveRightResult :: [Char] -> Int -> Char-> [Char] -- WORK
136 getPlayerMoveRightResult line n player
137 | (line !! (n+1) /= 'x') = clear1dPlayerPerviousPosition (moveRight line n player) n
138 | otherwise               = line
139 -----
140 getPlayerMoveUpResult :: [[Char]] -> Int -> Int -> Char -> [[Char]]
141 getPlayerMoveUpResult maze x y player
142 | (maze !! (x-1) !! y /= 'x') = clearPlayerPerviousPosition (moveUp maze x y player)
    x y
143 | otherwise                   = maze -- not move
144 -----
145 append1dListTo2dListRowWise :: [Char] -> [[Char]] -> [[Char]] -- WORK
146 append1dListTo2dListRowWise moveResult fragMaze = fragMaze ++ [moveResult]
147 -----
148 -- *Helpers> movePlayerLeftBeforeRotate "x---1x" 4 '1' ["x---x","xxxxxx"]
149 -- ["x---x","xxxxxx","x1---x"]
150 movePlayerLeftBeforeRotate :: [Char] -> Int -> Char -> [[Char]] -> [[Char]] -- WORK
151 movePlayerLeftBeforeRotate playerRow n player perviousRows =
    append1dListTo2dListRowWise (getPlayerMoveLeftResult playerRow n player)
    perviousRows
152 -----
153 -- *Helpers> movePlayerRightBeforeRotate "x1---x" 1 '1' ["x---x","xxxxxx"]

```

```

154 -- ["x----x", "xxxxxx", "x--1x"]
155 movePlayerRightBeforeRotate :: [Char] -> Int -> Char -> [[Char]] -> [[Char]] -- WORK
156 movePlayerRightBeforeRotate playerRow n player perviousRows =
    append1dListTo2dListRowWise (getPlayerMoveRightResult playerRow n player)
    perviousRows
157 -----
158 -- *Helpers> mazeBeforeRotateMovePlayerLeft ["xxxx", "x----1x", "xxxx"] 1 5
159 -- ["xxxx", "x1----x", "xxxx"]
160 mazeBeforeRotateMovePlayerLeft :: [[Char]] -> Int -> Int -> [[Char]] -- WORK
161 mazeBeforeRotateMovePlayerLeft maze playerX playerY = (movePlayerLeftBeforeRotate (
    maze!!playerX) playerY (maze!!playerX!!playerY) (take playerX maze)) ++ (drop (
    playerX+1) maze)
162 -----
163 -- *Helpers> mazeBeforeRotateMovePlayerRight ["xxxx", "x1----x", "xxxx"] 1 1
164 -- ["xxxx", "x----1x", "xxxx"]
165 mazeBeforeRotateMovePlayerRight :: [[Char]] -> Int -> Int -> [[Char]] -- WORK
166 mazeBeforeRotateMovePlayerRight maze playerX playerY = (movePlayerRightBeforeRotate (
    maze!!playerX) playerY (maze!!playerX!!playerY) (take playerX maze)) ++ (drop (
    playerX+1) maze)
167 -----
168 -- ["xxxx", "x-1x", "xxxx"] 0 => ["xxx"]
169 getColumn :: [[Char]] -> Int -> [Char] -- WORK
170 getColumn [] _ = []
171 getColumn (h:rest) n = [h!!n] ++ (getColumn rest n)
172 -----
173 backward :: [Char] -> [Char] -- WORK
174 backward [] = []
175 backward (h:rest) = backward rest ++ [h]
176 -----
177 -- *Helpers> cclockwiseMaze ["xxxx", "x1-x", "xxxx"] 0
178 -- ["xxx", "x-x", "x1x", "xxx"]
179 cclockwiseMaze :: [[Char]] -> Int -> [[Char]] --WORK
180 cclockwiseMaze maze n
181 | ((n+1) > length(maze!!0)) = []
182 | otherwise = [getColumn maze (length(maze!!0)-(n+1))] ++ (
    cclockwiseMaze maze (n+1))
183 -----
184 -- no need to consider player move (palyer already move)
185 clockwiseMaze :: [[Char]] -> Int -> [[Char]] -- TODO: not performing correct
186 clockwiseMaze mazeAfterplayerMove n -- n starts from 0
187 | ((n+1) > length(mazeAfterplayerMove!!0)) = [] -- finish loop through all token in
    maze
188 | otherwise = [(backward (getColumn
    mazeAfterplayerMove n))] ++ (clockwiseMaze mazeAfterplayerMove (n+1))
189 -----
190 -- no need to consider player move
191 -- *Helpers> [backward (["xxxx", "xx-x", "xg1x", "xxxx"] !! 3)]
192 -- ["xxxx"]
193 -- *Helpers> [backward (["xxxx", "xx-x", "xg1x", "xxxx"] !! 2)]
194 -- ["x1gx"]
195 -- *Helpers> [backward (["xxxx", "xx-x", "xg1x", "xxxx"] !! 3)] ++ [backward (["xxxx", "
    xx-x", "xg1x", "xxxx"] !! 2)]
196 -- ["xxxx", "x1gx"]
197 -- *Helpers> flipwiseMaze ["xxxx", "xx1x", "xg-x", "xxxx"] 0
198 -- ["xxxx", "x-gx", "x1xx", "xxxx"]
199 flipwiseMaze :: [[Char]] -> Int -> [[Char]] --WORK
200 flipwiseMaze mazeAfterplayerMove n -- n starts with 0
201 | ((n+1) > length(mazeAfterplayerMove)) = []
202 | otherwise = [backward (mazeAfterplayerMove !! (length(
    mazeAfterplayerMove)-(n+1)))] ++ (flipwiseMaze mazeAfterplayerMove (n+1))

```

```

203 -----
204 -- *Helpers> clockwiseMaze (mazeBeforeRotateMovePlayerRight ["xxxx", "x1-x", "xxxx"]
    1 1) 0
205 -- ["xxx","x-x","x1x","xxx"]
206 -- *Helpers> clockwiseMazeResult ["xxxx", "x1-x", "xxxx"] 1 1
207 -- ["xxx","x-x","x1x","xxx"]
208 clockwiseMazeResult :: [[Char]] -> Int -> Int -> [[Char]] -- WORK
209 clockwiseMazeResult maze playerX playerY = clockwiseMaze (
    mazeBeforeRotateMovePlayerRight maze playerX playerY) 0
210 -----
211 -- cclockwiseMaze (mazeBeforeRotateMovePlayerLeft ["xxxx", "x-1x", "xxxx"] 1 2) 0
212 -- ["xxx","x-x","x1x","xxx"]
213 -- *Helpers> cclockwiseMazeResult ["xxxx", "x-1x", "xxxx"] 1 2
214 -- ["xxx","x-x","x1x","xxx"]
215 cclockwiseMazeResult :: [[Char]] -> Int -> Int -> [[Char]] -- WORK
216 cclockwiseMazeResult maze playerX playerY = cclockwiseMaze (
    mazeBeforeRotateMovePlayerLeft maze playerX playerY) 0
217 -----
218 -- *Helpers> find1dPlayerPosition "x-1x" 0
219 -- 2
220 -- *Helpers> find1dPlayerPosition "x----xxx1x" 0
221 -- 8
222 find1dPlayerPosition :: [Char] -> Int -> Int -- WORK
223 find1dPlayerPosition row idx
224   | (idx > (length(row)-1)) = -1 -- cannot find player
225   | ((row !! idx /= 'x') && (row !! idx /= '-') && (row !! idx /= 'g')) = idx
226   | otherwise = find1dPlayerPosition row (idx+1)
227 -----
228 -- get index of first player seen in 2d maze
229 -- *Helpers> find2dPlayerPostion ["xxx", "x-x", "x1x", "xxx"] 0
230 -- [2,1]
231 -- *Helpers> find2dPlayerPostion ["xxx", "x-x", "x-x", "xxx"] 0
232 -- [-1,-1]
233 find2dPlayerPostion :: [[Char]] -> Int -> [Int] -- WORK
234 find2dPlayerPostion (row:rest) r
235   | (length(rest)==0) = [-1,-1] -- cannot find player
236   | (find1dPlayerPosition row 0 == -1) = find2dPlayerPostion rest (r+1)
237   | otherwise = [r] ++ [find1dPlayerPosition row 0]
238 -----
239 -- *Helpers> clockwiseMazeResult ["xxxx", "x1-x", "xxxx"] ((find2dPlayerPostion ["
    xxxx", "x1-x", "xxxx"] 0)!!0) ((find2dPlayerPostion ["xxxx", "x1-x", "xxxx"] 0)
    !!1)
240 -- ["xxx","x-x","x1x","xxx"]
241 clockwiseMazewithoutPlayerIndexAsInput :: [[Char]] -> [[Char]] -- WORK
242 clockwiseMazewithoutPlayerIndexAsInput maze = clockwiseMazeResult maze ((
    find2dPlayerPostion maze 0)!!0) ((find2dPlayerPostion maze 0)!!1)
243 -----
244 cclockwiseMazewithoutPlayerIndexAsInput :: [[Char]] -> [[Char]] -- WORK
245 cclockwiseMazewithoutPlayerIndexAsInput maze = cclockwiseMazeResult maze ((
    find2dPlayerPostion maze 0)!!0) ((find2dPlayerPostion maze 0)!!1)
246 -----
247 flipMazewithouIndexAsInput :: [[Char]] -> [[Char]] -- WORK
248 flipMazewithouIndexAsInput maze = flipwiseMaze mazeAfterplayerMove 0
249     where
250         mazeAfterplayerMove = getPlayerMoveUpResult maze x
    y player
251         x = (find2dPlayerPostion maze 0)
    !!0
252         y = (find2dPlayerPostion maze 0)
    !!1

```

```

253                                     player                = maze !! x !! y
254 -- flipMazewithouIndexAsInput maze = flipwiseMaze (getPlayerMoveUpResult maze ((
      find2dPlayerPostion maze 0)!!0) ((find2dPlayerPostion maze 0)!!1) maze!!((
      find2dPlayerPostion maze 0)!!0)!!((find2dPlayerPostion maze 0)!!1)) 0
255 -----
256 hasgoalLine :: [Char] -> Bool -- WORK
257 hasgoalLine (h:rest)
258   | (h == 'g')    = True -- find goal
259   | (rest == []) = False -- exahaust list and no goal
260   | otherwise     = hasgoalLine rest
261
262 hasgoal :: [[Char]] -> Bool -- WORK
263 hasgoal [] = False
264 hasgoal (row:rest) = ((hasgoalLine row) || (hasgoal rest))
265 -----
266 findPlayers :: [[Char]] -> Int -> Int -> [Char] -- WORK
267 findPlayers [] _ _ = []
268 findPlayers maze x y
269   | (x > (length(maze)-1))                                = [] -- go
      through all maze
270   | (isPlayer(maze !! x !! y))                             = [maze !! x
      !! y] ++ (findPlayers maze x (y+1)) -- find in col
271   | (((x+1)<(length(maze)-1)) && ((y+1)>=(length(maze!!x)-1))) = findPlayers
      maze (x+1) 0 -- find next row
272   | ((not(isPlayer(maze !! x !! y))) && ((y+1) < (length(maze !! x)-1))) = findPlayers
      maze x (y+1) -- not find in col
273   | otherwise                                              = []
274 -----
275 -- *Helpers> find2dMultiPlayersPostion ["xxxxxx", "x----x","x----x","xx-1xx","x--2-x
      ", "x----x3x----x","x--xg4x","xxxxxx"] 0 0
276 -- [
277 -- [1,3,3], ==> [player,x,y]
278 -- [2,4,3],
279 -- [3,5,6],
280 -- [4,6,5]
281 --]
282 -- *Helpers> find2dMultiPlayersPostion ["xxxxxx", "x----x","x----x","xx-3xx","x--1-x
      ", "x----x4x----x","x--xg2x","xxxxxx"] 0 0
283 -- [[3,3,3],[1,4,3],[4,5,6],[2,6,5]] order doesn't matter
284 find2dMultiPlayersPostion :: [[Char]] -> Int -> Int -> [[Int]] -- same player order
      with findPlayers -- WORK
285 find2dMultiPlayersPostion [] _ _ = []
286 find2dMultiPlayersPostion maze x y
287   | (x > (length(maze)-1))                                = [] -- go
      through all maze
288 -----
289   | (isPlayer(maze !! x !! y))                             = [[
      digitToInt (maze !! x !! y)]++[x]++[y]] ++ find2dMultiPlayersPostion maze x (y+1)
      -- find in col
290   | (((x+1)<(length(maze)-1)) && ((y+1)>=(length(maze!!x)-1))) =
      find2dMultiPlayersPostion maze (x+1) 0 -- find next row
291   | ((not(isPlayer(maze !! x !! y))) && ((y+1) < (length(maze !! x)-1))) =
      find2dMultiPlayersPostion maze x (y+1) -- not find in col
292   | otherwise                                              = []
293 -----
294 -- *Helpers> multiPlayerMoveUp ["xxxx", "x--x", "x12x", "xxxx"] [[1,2,1],[2,2,2]]
295 -- ["xxxx","x12x","x--x","xxxx"]
296 -- *Helpers> multiPlayerMoveUp ["xxxx", "x3-x", "x12x", "xxxx"]
      [[1,2,1],[2,2,2],[3,1,1]]
297 -- ["xxxx","x32x","x1-x","xxxx"]

```

```

298 multiPlayerMoveUp :: [[Char]] -> [[Int]] -> [[Char]] -- WORK
299 multiPlayerMoveUp [] _ = []
300 multiPlayerMoveUp maze [] = maze
301 multiPlayerMoveUp maze (playerXNameAndPostion:rest) = multiPlayerMoveUp
    mazeAfterOnePlayerMoveUp rest
302
303                                     where
304                                     mazeAfterOnePlayerMoveUp
305                                     | (maze !! (playerX-1) !!
playerY == 'x') || (isPlayer(maze !! (playerX-1) !! playerY)) = maze
306                                     | otherwise
307                                     =
308                                     clearPlayerPerviousPosition (moveUp maze playerX playerY playerName) playerX
309                                     playerY
310                                     playerName = intToChar(
311                                     playerXNameAndPostion!!0)
312                                     playerX =
313                                     playerXNameAndPostion!!1
314                                     playerY =
315                                     playerXNameAndPostion!!2
316 -----
317 -- *Helpers> multiPlayerMoveLeft ["xxxx","x1-x","x2-x","xxxx"] [[1,1,2],[2,2,2]]
318 -- ["xxxx","x1-x","x2-x","xxxx"]
319 -- *Helpers> multiPlayerMoveLeft ["xxxx","x1-x","x2-x","xxxx"] [[1,1,2],[2,2,1]]
320 -- ["xxxx","x1-x","x2-x","xxxx"]
321 multiPlayerMoveLeft :: [[Char]] -> [[Int]] -> [[Char]] -- WORK
322 multiPlayerMoveLeft [] _ = []
323 multiPlayerMoveLeft maze [] = maze
324 multiPlayerMoveLeft maze (playerXNameAndPostion:rest) = multiPlayerMoveLeft
    mazeAfterOnePlayerMoveLeft rest
325
326                                     where
327                                     mazeAfterOnePlayerMoveLeft
328                                     | (maze !! playerX !! (
playerY-1) == 'x') || (isPlayer(maze !! playerX !! (playerY-1))) = maze -- not
329                                     move when other player or x in the way
330                                     | otherwise
331                                     =
332                                     mazeBeforeRotateMovePlayerLeft maze playerX playerY
333                                     playerName = intToChar
334                                     (playerXNameAndPostion!!0)
335                                     playerX =
336                                     playerXNameAndPostion!!1
337                                     playerY =
338                                     playerXNameAndPostion!!2
339 -----
340 multiPlayerMoveRight :: [[Char]] -> [[Int]] -> [[Char]] -- WORK
341 multiPlayerMoveRight [] _ = []
342 multiPlayerMoveRight maze [] = maze
343 multiPlayerMoveRight maze (playerXNameAndPostion:rest) = multiPlayerMoveRight
    mazeAfterOnePlayerMoveRight rest
344
345                                     where
346                                     mazeAfterOnePlayerMoveRight
347                                     | ((maze !! playerX !! (
playerY+1) == 'x') || (isPlayer(maze !! playerX !! (playerY+1)))) = maze
348                                     | otherwise
349                                     =
350                                     mazeBeforeRotateMovePlayerRight maze playerX playerY
351                                     playerName =
352                                     intToChar(playerXNameAndPostion!!0)
353                                     playerX =

```

```

336     playerXNameAndPostion!!1
337                                     playerY      =
338     playerXNameAndPostion!!2
339 -----
338 getMultiPlayerMoveLeftResult :: [[Char]] -> [[Char]] -- WORK
339 getMultiPlayerMoveLeftResult maze = multiPlayerMoveLeft maze (
340     find2dMultiPlayersPostion maze 0 0)
341 -----
341 getMultiPlayerMoveRightResult :: [[Char]] -> [[Char]] -- TODO: check this before
342     moving further
342 getMultiPlayerMoveRightResult maze = multiPlayerMoveRight maze (
343     find2dMultiPlayersPostion maze 0 0)
344 -----
344 getMultiPlayerMoveUpResult :: [[Char]] -> [[Char]] -- TODO: check this before moving
345     further
345 getMultiPlayerMoveUpResult maze = multiPlayerMoveUp maze (find2dMultiPlayersPostion
346     maze 0 0)
347 -----
347 intToChar :: Int -> Char --WORK
348 intToChar m = (show m) !! 0
349 -----
350 getMultiPlayerClockwise :: [[Char]] -> [[Char]]
351 getMultiPlayerClockwise maze = clockwiseMaze (getMultiPlayerMoveRightResult maze) 0
352 -----
353 getMultiPlayerCClockwise :: [[Char]] -> [[Char]]
354 getMultiPlayerCClockwise maze = cclockwiseMaze (getMultiPlayerMoveLeftResult maze) 0
355 -----
356 getMultiPlayerFlipwise :: [[Char]] -> [[Char]]
357 getMultiPlayerFlipwise maze = flipwiseMaze (getMultiPlayerMoveUpResult maze) 0

```