Homework #3

Fall 2015

Due date: 2015/11/15

Mining Battle

You are the owner of a mine shaft with 4 hard-working miner. One day, you want to know that who is the best miner in your team and held a mining competition.

Requirements

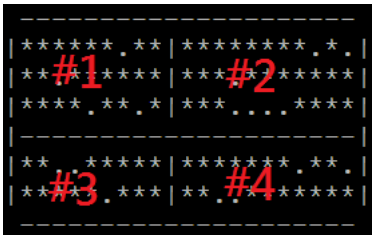
- Write a program with 1 argument “map_name”.
- This program need to read the map file according to ”map_name”
  - The content of map file will like this:

```
dcslab@NetPro:~/NetPro/hw3$ cat map1
..#**
**#.*
#####
.*#**
.*#*.
```

    - ‘*’ means a gold in there.
    - ‘.’ means an empty hole
    - ‘#’ means a wall
- After reading the map file, show the map by this format:

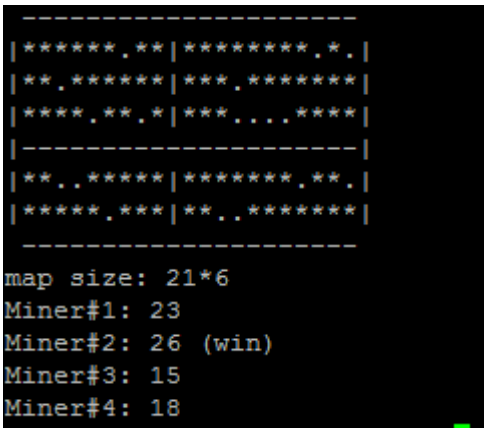
```
dcslab@NetPro:~/NetPro/hw3$ node multi_process.js map1
 -----
|..|**|
|**|.*|
|-----|
|.*|**|
|.*|*.|
 -----
map size: 5*5
```

  - Please add boundaries and replace ‘#’ by ‘-’ or ‘|’.
  - And then, show the size of this map (width * length)
- Now, create 4 processes (or threads) to represent the miner.
  - The miner need to collect the gold in assigned field.
    - When he meets a gold, the score of this miner will plus one.
    - When he meets a hole, nothing happen.
    - The miner cannot across the wall.
  - The field of each miner would like:

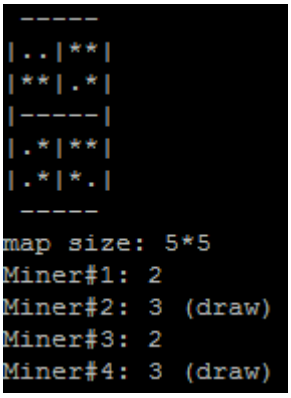


- After the miner finishing his job, send his score back to parent processes and terminate this process (or thread).

- When the program receive all results from 4 miner, show every one's score and choose the best one.
  - If a miner has highest score, tag him a notation "win"

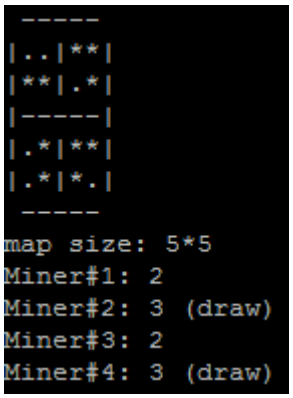


  - If two or more miner have highest score, tag them a notation "draw"

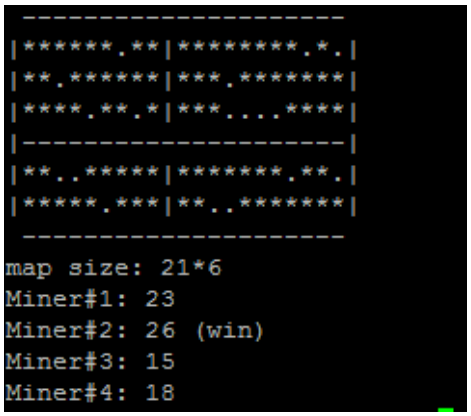


- We would not tell you the size of map, but it is rectangle and maximum would not greater than 2000*2000.
- Walls would be orthogonal.

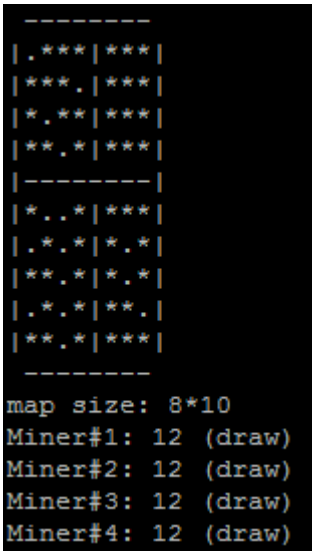
Sample Run



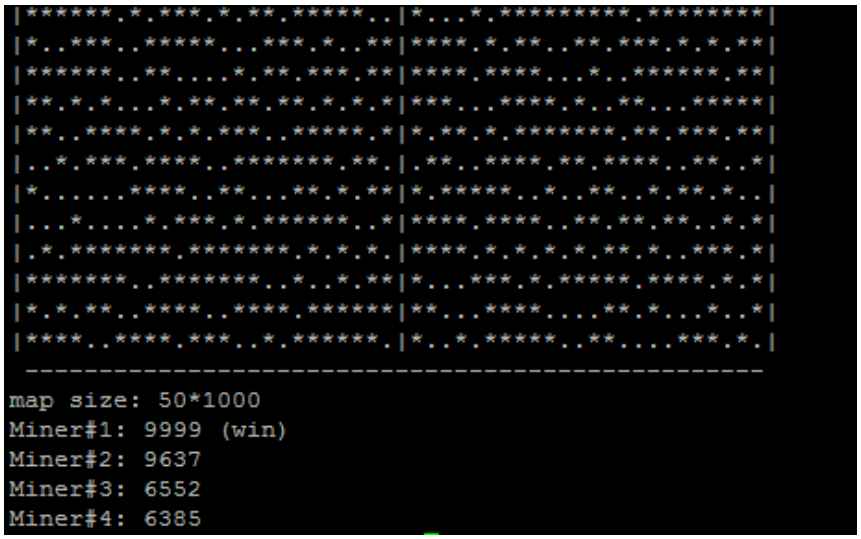
```
map size: 5*5
Miner#1: 2
Miner#2: 3 (draw)
Miner#3: 2
Miner#4: 3 (draw)
```



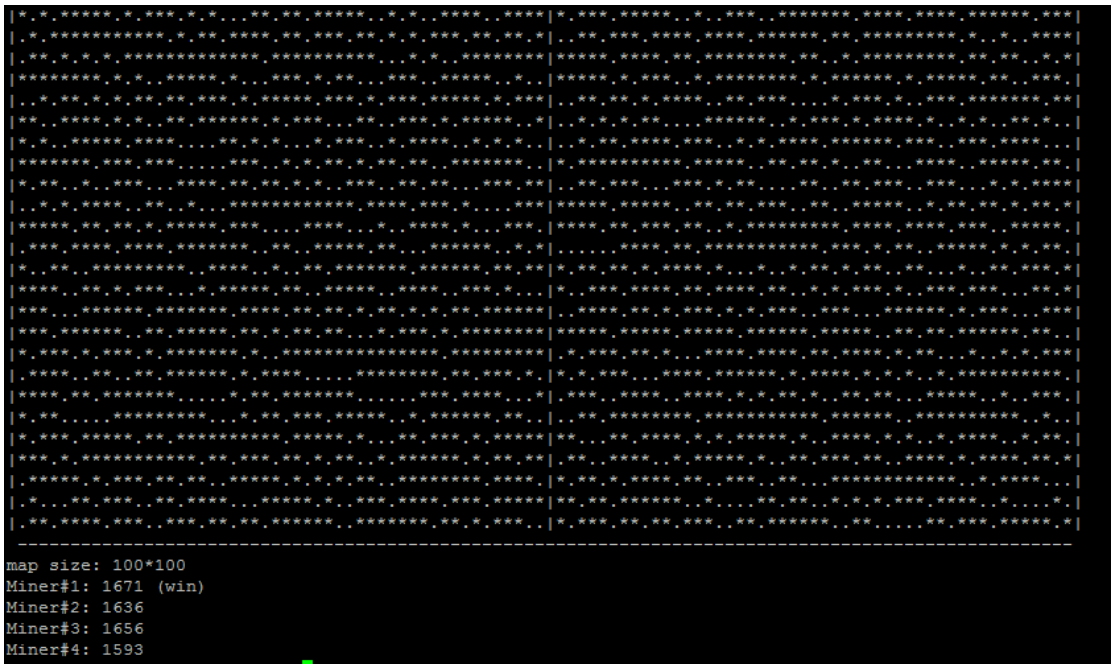
```
map size: 21*6
Miner#1: 23
Miner#2: 26 (win)
Miner#3: 15
Miner#4: 18
```



```
map size: 8*10
Miner#1: 12 (draw)
Miner#2: 12 (draw)
Miner#3: 12 (draw)
Miner#4: 12 (draw)
```



```
map size: 50*1000
Miner#1: 9999 (win)
Miner#2: 9637
Miner#3: 6552
Miner#4: 6385
```



```
map size: 100*100
Miner#1: 1671 (win)
Miner#2: 1636
Miner#3: 1656
Miner#4: 1593
```

Demo

- Program runs correctly. (60%)
- Game displays correctly. (10%)
- Oral defense (30%)

Note

1. In demo, we would provide 5 map files. (not sample maps)
2. You could use any programming language to write your own code.
3. You need to use multi-threads or multi-processes to finish this homework.