Assignment 2 – Stack and Queue

TA: Ruby (wei929098@hotmail.com)
Deadline: Oct. 31, 11:59pm

In this assignment, you need to use stacks and queues to implement a hunger game.

⌖ Mission description:

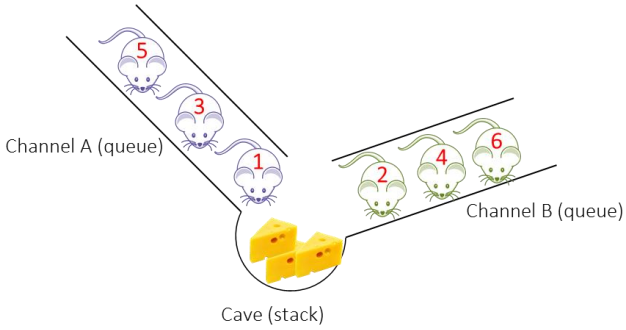


Figure 1. Illustration of this homework

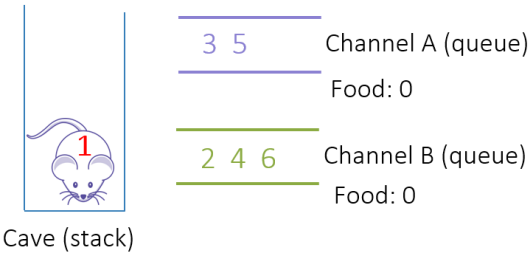
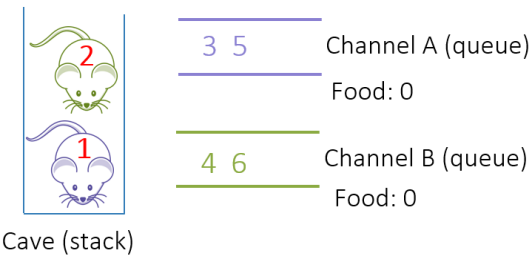
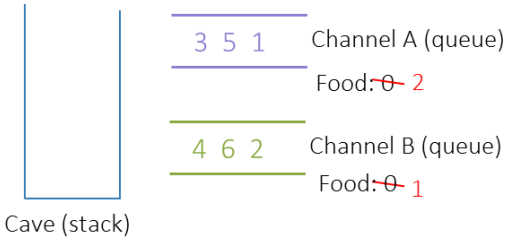
There are two teams; one is Team A (in Channel A) which contains mice with odd numbers (1,3,5) and the other is Team B (in Channel B) which contains mice with even numbers (2,4,6). Two teams are competing for the cheeses. The game will end at the 200th round. Two teams tally their own cheeses. The team with the most pieces of cheeses wins!

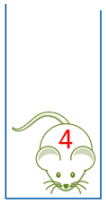
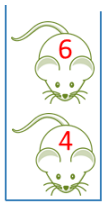
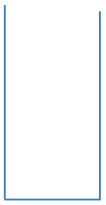
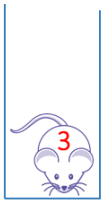
⌖ Game rules:

1. The cheeses are in the cave which is a stack.
2. The mice are in the channel which is a queue.
3. In the beginning, two teams assign a mouse into the cave.
4. The team which gets the less cheeses has the highest priority to get into the cave.
5. If two teams have the same amount of cheeses, Team A has the highest priority to get into the cave.
6. The mouse in the cave can get only one cheese for each round.
7. Every mouse will stay in the cave two rounds as possible. However, the same mouse can only stay in the cave for up to two rounds. (Because the team with the most pieces of cheeses wins, every mouse will try their best to get the most pieces of cheeses.)
8. The cave holds up to two mice.
9. Only one mouse can enter the cave for each round.

10. Up to two mice can exit the cave at the same round.
11. When the cave is empty, a mouse should enter the cave immediately at the same round.
12. The same mouse **cannot** get in and exit the cave at the same round.
13. When entering or exiting the cave/channel, each mouse should follow the insertion/deletion rules of stacks/queues.
14. When a mouse exit the cave, it goes back to the end of its channel.

⌖ Example:

Round	Graphic illustration	Detail
0		
1		According to rules #3 and #5, Team A assigns No.1 mouse into the cave.
2		According to rule #3, Team B assigns No.2 mouse into the cave.
3		According to rule #7, No.1 mouse needs to exit the cave. As the result, No.2 and No.1 mice exit the cave in order. According to rule #6, No.1 mouse takes two pieces of cheeses out, and No.2 mouse takes one cheese out. According to rules #11

	 Cave (stack) 	and #4, Team B assigns No.4 mouse into the cave.
4	 Cave (stack) 	According to rule #4, Team B assigns No.6 mouse into the cave.
5	 Cave (stack)   Cave (stack) 	According to rule #7, No.4 mouse needs to exit the cave. As a result, No.6 and No.4 exit the cave in order. According to rule #6, No.4 mouse takes two pieces of cheeses out, and No.6 mouse takes one cheese out. According to rules #11 and #4, Team A assigns No.3 mouse into the cave.
...		

The game will end at the 200th round.

ATTENTION: You must output a result.txt that records the conditions of the cave, two channels, and the amount of cheeses of 17th round, 87th round, and 200th round.

Taking 17th round for example, please output the condition information in the same format as shown in the following figure:

```
Round  17
Channel A food:  11
Channel B food:  13

Cave:
 1

Channel A:
 5  3
Channel B:
 4  6  2
```

Submit:

To submit your files electronically, enter the following command from the csie workstation:

turnin hw2 [your files…]

To check the files you turnin, enter the following command from the csie workstation:

turnin -ls hw2

You can see other description about turnin from following link: https://www.cs.ccu.edu.tw/~lab401/doku.php?id=turninhowto

Grade (for TA):

The TA(s) will mark and give points according to the following rules:

- 10% Your source code can be compiled without any errors.
- 10% Readme file, code style, and comments in the source code
- 80% Result correctness (result.txt)

Readme file should include your name, class ID, a brief description of the code, and other issues students think that will be helpful for the TAs to understand their homework.