CSE201 Advanced Programming
Lab Assignment 04
30th August 2019. Due by 11:59pm on 1st Sep 2019

This is a take-home lab assignment. No extensions whatsoever will be provided. Any submission after the deadline will not be evaluated. If you see any ambiguity or inconsistency in a question, please seek clarification from the teaching staff. Please read the entire text below very carefully before starting your implementation.

Plagiarism: All submitted lab assignments are expected to be the result of your individual effort. You should never misrepresent someone else's work as your own. In case any plagiarism case is detected, it will be dealt as per IIITD plagiarism policy and without any relaxations: https://www.iiitd.ac.in/sites/default/files/docs/education/AcademicDishonesty.pdf

Please note that you are not allowed to discuss the design/solution of the lab assignment (e.g. classroom page discussions etc.). Anyone who is found doing this will be charged with plagiarism case. No excuses!

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Note that this Assignment is an extension of Assignment-3. Hence, apart from the OOP features required in assignment-3, this assignment also requires demonstration of object cloning, object comparison, and object equality check.

The head of ArchFable is impressed with the work you have done so far and has asked you to implement some more functionalities in the game, ArchLegends. They want the hero of the

game to have a Sidekick. Sidekick has attributes XP and HP. The user can get a sidekick by exchanging some of the hero's XP in return for a sidekick (explained below). The more XP the hero is ready to give up, the stronger is the attack of the sidekick. For each extra XP (above the base cost associated with each type of sidekicks) that the hero gives up, the damage done by the sidekick to the opponent increases by 0.5 HP.

A sidekick can only Attack (*recall the Attack feature from Assignment-3*). The maximum HP of a sidekick is 100. Given below is the description of the two different types of sidekicks:

1) **Minions**

   (a) A minion can clone itself and produces 3 more minions once during the entire game. This means that during all the fights in the game, you can use the cloning power of minion only in any one fight. In the next remaining fights, the clones will disappear (won't be available).
   (b) Attack: Initially each attack causes 1 HP damage to the opponent.
   (c) The hero needs to give up at least 5 XP to buy a minion.
   (d) If in a fight the hero wins by using a minion sidekick, and gains N XP, the minion will gain N/10 XP and HP will also refill to max value associated with the minion.

2) **Knight**

   (a) In a fight against a zombie, having a knight sidekick, will increase the hero's defense ability. If the hero's defense ability initially causes the opponent to do N HP less damage, having a knight sidekick causes the opponent to do N+5 HP less damage. Please note this only happens in a case when the hero is fighting a zombie that is a Level 2 Monster.
   (b) Attack: Initially each attack causes 2 HP damage to the opponent.
   (c) The hero needs to give up at least 8 XP to buy a knight.
   (d) If in a fight the hero wins with a knight sidekick and gains N XP, the knight will gain N/10 XP and HP will also refill to the max.

After each fight, you will get an option to either use your XP to upgrade the hero's level or buy a sidekick *(one of the two must happen)*. The sidekick can be bought from a buy sidekick option which will be displayed before you start with any fight. A hero can buy multiple sidekicks. All the sidekicks the hero have bought are available during the entire game. A hero can have any number of sidekicks but in any given fight, only one of those sidekicks could be used by the hero. If the hero wants to use a sidekick in a fight, he can only use the sidekick (out of all those that he has) with the maximum XP. When a hero has a sidekick and he chooses to attack, he first inflicts damage to the monster with his own attack, followed by the attack of his sidekick. If the hero is damaged by N HP in an attack by the opponent, the sidekick gets damaged by 1.5*N HP. Once the HP of a sidekick becomes 0, that sidekick dies and is no longer available.

With increase in XP of the sidekick, its attacking ability increases. For each 5 XP increase, the damage caused to the opponent increases by 1 HP.

A sample test case is provided below. Note that the sample input/output described in **blue font** are copy-pasted from assignment-3. The ones mentioned in **black font** are describing the scenario of this particular assignment.

--Sample Input/Output--
Welcome to ArchLegends
Choose your option
1) New User
2) Existing User
3) Exit
1
Enter Username
pan
Choose a Hero
1) Warrior
2) Thief
3) Mage
4) Healer
2
User Creation done. Username: pan. Hero type: Thief. Log in to play the game . Exiting
Welcome to ArchLegends
Choose your option
1) New User
2) Existing User
3) Exit
2
Enter Username
pan
User Found... logging in
Welcome pan
You are at the starting location. Choose path:
1) Go to Location 0
2) Go to Location 3
3) Go to Location 6
Enter -1 to exit
1
Moving to location 0.
Fight Started. Your fighting a level 1 Monster.
Choose move:
1) Attack
2) Defense
1
You choose to attack.
You attacked and inflicted 6 damage to the monster.

Your Hp: 100/100 Monsters Hp: 94/100

Monster attack!

The monster attacked and inflicted 15 damage to you.

Your Hp: 85/100Monsters Hp: 94/100

Choose move:

1) Attack

2) Defense

1

You choose to attack

You attacked and inflicted 6 damage to the monster.

Your Hp: 85/100 Monsters Hp: 88/100

Monster attack!

The monster attacked and inflicted 13 damage to you.

Your Hp: 72/100 Monsters Hp: 88/100

Choose move:

1) Attack

2) Defense

1

You choose to attack

You attacked and inflicted 6 damage to the monster.

Your Hp: 72/100Monsters Hp: 82/100

Monster attack!

The monster attacked and inflicted 12 damage to you.

Your Hp: 60/100Monsters Hp: 82/100

Choose move:

1) Attack

2) Defense

3)Special Attack

3

Special power activated

Performing special attack

You have stolen 25 Hp from the monster!

Your Hp: 85/100 Monsters Hp: 57/100

Monster attack!

The monster attacked and inflicted 10 damage to you.

Your Hp: 75/100 Monsters Hp: 57/100

Special power deactivated.

Choose move:

1) Attack

2) Defense

1

You choose to attack

You attacked and inflicted 6 damage to the monster.

Your Hp: 75/100 Monsters Hp: 51/100

Monster attack!

The monster attacked and inflicted 5 damage to you.

Your Hp: 70/100 Monsters Hp: 51/100

Choose move:

1) Attack

2) Defense

1

You choose to attack

You attacked and inflicted 6 damage to the monster.

Your Hp: 70/100 Monsters Hp: 45/100

Monster attack!

The monster attacked and inflicted 4 damage to you.

Your Hp: 66/100 Monsters Hp: 45/100

Choose move:

1) Attack

2) Defense

2

You choose to defend

Monster attack reduced by 4!

Your Hp: 66/100 Monsters Hp: 45/100

Monster attack!

The monster attacked and inflicted 3 damage to you.

Your Hp: 63/100 Monsters Hp: 45/100

Choose move:

1) Attack

2) Defense

3)Special Attack

3

Special power activated

Performing special attack

You have stolen 14 Hp from the monster!

Your Hp: 77/100 Monsters Hp: 31/100

Monster attack!

The monster attacked and inflicted 4 damage to you.

Your Hp: 73/100 Monsters Hp: 31/100

Special power deactivated.

Choose move:

1) Attack

2) Defense

1

You choose to attack

You attacked and inflicted 6 damage to the monster

Your Hp: 73/100 Monsters Hp: 25/100

Monster attack!

The monster attacked and inflicted 3 damage to you.

Your Hp: 70/100 Monsters Hp: 25/100

Choose move:

1) Attack

2) Defense

1

You choose to attack

You attacked and inflicted 6 damage to the monster

Your Hp: 70/100 Monsters Hp: 19/100

Monster attack!

The monster attacked and inflicted 0 damage to you.

Your Hp: 70/100 Monsters Hp: 19/100

Choose move:

1) Attack

2) Defense

2

You choose to defend

Monster attack reduced by 4!

Your Hp: 70/100 Monsters Hp: 19/100

Monster attack!

The monster attacked and inflicted 0 damage to you.

Your Hp: 70/100 Monsters Hp: 19/100

Choose move:

1) Attack

2) Defense

3) Special Attack

1

You attacked and inflicted 6 damage to the monster

Your Hp: 70/100 Monsters Hp: 13/100

Monster attack!

The monster attacked and inflicted 4 damage to you.

Your Hp: 66/100 Monsters Hp: 13/100

Choose move:

1) Attack

2) Defense

3) Special Attack

1

You choose to attack

You attacked and inflicted 6 damage to the monster

Your Hp: 66/100 Monsters Hp: 7/100

Monster attack!

The monster attacked and inflicted 1 damage to you.
Your Hp: 65/100 Monsters Hp: 7/100
Choose move:
1) Attack
2) Defense
3) Special Attack
1
You choose to attack
You attacked and inflicted 6 damage to the monster
Your Hp: 65/100 Monsters Hp: 1/100
Monster attack!
The monster attacked and inflicted 0 damage to you.
Your Hp: 65/100 Monsters Hp: 1/100
Choose move:
1) Attack
2) Defense
3) Special Attack
1
You choose to attack
You attacked and inflicted 6 damage to the monster
Your Hp: 75/100 Monsters Hp: 0/100
Monster killed!
20 XP awarded
Fight won proceed to the next location.
If you would you like to buy a sidekick, type yes. Else type no to upgrade level.
yes
Your current XP is 20.0
If you want to buy a minion, press 1.
If you want to buy a knight, press 2.
1
XP to spend: 7
You bought a sidekick: minion
XP of sidekick is 0.0
Attack of sidekick is 2
You are at location 0 Choose path:
1) Go to Location 1
2) Go to Location 4
3) Go to Location 7
4) Go back
Enter -1 to exit
1
Moving to location 1.
Fight Started. You are fighting a level 1 Monster

Type yes if you wish to use a sidekick, else type no.

yes

You have a sidekick Minion with you. Attack of sidekick is 2.

Press c to use cloning ability. Else press f to move to the fight

c

Cloning done.

Choose move:

1) Attack

2) Defense

1

You chose to attack

You attacked and inflicted **6** damage to the monster.

Sidekick attacked and inflicted 2 damage to the monster.

Sidekick attacked and inflicted 2 damage to the monster.

Sidekick attacked and inflicted 2 damage to the monster.

Sidekick attacked and inflicted 2 damage to the monster.

Sidekick Hp:100.0/100

Sidekick Hp:100.0/100

Sidekick Hp:100.0/100

Sidekick Hp:100.0/100

Your Hp: **100.0/100** Monsters Hp :**86.0/100**

Monster attack!

The monster attacked and inflicted 13 damage to you.

Your Hp: **87.0/100** Monsters Hp :**86.0/100**

Sidekick's Hp: 80.5/100

Sidekick's Hp: 80.5/100

Sidekick's Hp: 80.5/100

Sidekick's Hp: 80.5/100

Choose move:

1) Attack

2) Defense

2

You chose to defend

Monster attack reduced by **4**!

Your Hp: **87.0/100** Monsters Hp :**86.0/100**

Monster attack!

The monster attacked and inflicted 5 damage to you.

Your Hp: **82.0/100** Monsters Hp :**86.0/100**

Sidekick's Hp: 73.0/100

Sidekick's Hp: 73.0/100

Sidekick's Hp: 73.0/100

Sidekick's Hp: 73.0/100

---End of sample input/output---