

## CSE201 Advanced Programming

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***Note that this is an extension of ArchLegends Version-1. Hence, apart from the OOP features required in ArchLegends Version-1, this version 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  $1.5 \times N$  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: 85/100 Monsters 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: 72/100 Monsters Hp: 82/100

Monster attack!

The monster attacked and inflicted 12 damage to you.

Your Hp: 60/100 Monsters 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---