Lab Assignment-3 (Inheritance)

IIIT-Delhi. 17th August 2017. Due by 23:59pm on 17th August 2017

Instructor: Vivek Kumar

No extensions will be provided. Any submission after the deadline will not be evaluated. If you see an ambiguity or inconsistency in a question, please seek a clarification from the teaching staff.

NOTE: Attendance in the lab is mandatory.

Plagiarism: All submitted homeworks 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 policy for plagiarism.

Problem Description:

In this assignment you will be creating a fantasy game that consists of mythological creatures. In this game, there are four different types of creatures: humans, dragons, daemons and wolves. To represent them, the **Creature** class must include the following:
name - Name of creature
power - Potential of damage it can cause
health - Amount of damage it can sustain
cost - Amount to purchase this creature
asset - Value it adds when it wins

Humans, *Dragons*, *Daemons* and *Wolves* are subclasses of the superclass *Creature*. *Fire Dragons* and *Ice Dragons* are two subclasses of *Dragons*.

Health of any creature is affected in every round of the combat it plays. The damage to the health is calculated as following:

1. Health of every creature in the combat is reduced by a random number between 0 and power of the rival.
2. If the combat is with a dragon, there is 15% chance it will lead to additional 25 points of damage to the health. The world additional denotes that the damage will be cumulative. In other words, a dragon can do 25 points more damage than a creature with a chance of 15%.

3. If the combat is with a daemon, there is 50% chance that same damage will occur again as daemons have supernatural power. Note “same damage” means the damage which occurred by generating a random number earlier (in point 1).
4. If the combat is with ice dragon, there is another 5% chance that they will attack again but damage will be random.

The total damage inflicted from the opponent should be calculated by combining the amount of damage at each level of the inheritance hierarchy. As an example, if the opponent is ice dragon, total damage caused by it would be the damage that creatures inflict, followed by damage that dragons might do, followed by 5% chance of damage that ice dragon can inflict.

The war is between *Team Good* and *Team Bad*. Assume that one of the team will always win the war. *Team Good* consists of humans, wolves and fire dragons while *Team Bad* consists of daemons and ice dragons. Both the teams has list of each type of creatures they have and the total amount of money for purchasing creatures available to them.

Write a **menu driven program** to play this game. To create both the teams, ask from the user the amount of money both the teams will have initially to start the match. Next for creatures enter the cost, asset , power and health (only name will be unique for a creature. If a creature is dragon (say) then the above mentioned values will be same). Next enter the type of creature they want to buy and insert in their teams. User must provide a unique name to the creature it inserts in the game.

As the game begins, decide which two creatures are going to battle from each team and the health is reduced for both the creatures as described below. After each round:

1. If health is > 0 for both the creatures, battle continues with same creatures in subsequent rounds.
2. If health is <= 0 for both the creatures, both of them are removed from the game.
3. If health is <= 0 for one, and > 0 for other, the defeated creature is removed from the game and asset of winning creature is added to the money of its corresponding team. Winning creature continues in next round while new creature is added for other team.
4. Teams can add new creature if they have enough money to buy them.

Game continues until no creature is left in a team for next round and the money for that team is not enough to buy more creatures. After a winner is determined, **print the winning team’s name and the total amount of money they have.**

A sample menu-driven input and output-

Blue lines are print statements. Anything within the brackets in green color is for explanation. Inputs by the user are represented by black color.

Menu-

Enter *Team Good's* total money
100
Enter *Team Bad's* total money
90
Enter cost, asset , power and health for Human (space-separated) -
20 10 10 20
Enter cost, asset , power and health for Fire Dragon (space-separated) -
50 40 60 100
Enter cost, asset , power and health for Ice Dragon (space-separated) -
50 40 60 100
Enter cost, asset , power and health for Daemon (space-separated) -
30 15 30 27
Enter cost, asset , power and health for Wolf (space-separated) -
40 35 45 70

Select Creatures For *Team Good:*

1. Human
2. Fire Dragon
3. Wolf
4. Exit Selection

2
Enter Name Of The Fire-Dragon -
Frago
Select Creatures For *Team Good:*

1. Human
2. Fire Dragon
3. Wolf
4. Exit Selection

3
Enter Name Of The Wolf -
Wyner

(This menu should exit ones the money left is not enough to buy creatures. Money left is 10 in this case and hence no creature can be added to Team Good)

Select Creatures For *Team Bad:*

1. Daemon

2. Ice Dragon
3. Exit Selection

2

Enter Name Of The Ice-Dragon-

Snowflake

Select Creatures For *Team Bad:*

1. Daemon
2. Ice Dragon
3. Exit Selection

1

Enter Name Of The Daemon-

Dimio

(This menu should exit ones the money left is not enough to buy creatures or user selects Exit Selection. Money left is 10 in this case and hence no creature can be added to Team Bad)

The War Begins -

Round-1:

Enter Creature from Good's Team to fight in the war -

Wyner

Enter Creature from Bad's Team to fight in the war -

Snowflake

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1. For Wyner Random number generated between [0,100]. Assume It is 10.
2. For Snowflake Random number generated between [0,70]. Assume It is 30
3. Now Assume that with 25% chance 25 pts damage is done again by Snowflake. Moreover assume that with 5% chance the damage is done again by Snowflake. Generate a random number again between [0,100]. This time it is 40.
4. Total damage to Wyner: 10 + 25 +40 = 75
5. Total Damage to Snowflake : 30

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Wyner Loses In Round-1

Money Of Bad's Team is 50

Money Of Good's Team is 10

(Menu for adding creatures to Good's Team not displayed since not enough money)

Select Creatures For *Team Bad:*

1. Daemon
2. Ice Dragon

3. Exit Selection

2

Enter Name Of The Ice-Dragon

FrostWing

(menu for adding exists as money left is 0 for Team Bad)

Round-2:

Enter Creature from Good's Team to fight in the war -

Frago

(No question asked for Bad's Team since snowflake will continue the war)

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1. For Frago Random number generated between [0,100]. Assume It is 50.
2. For Snowflake Random number generated between [0,100]. Assume It is 25.
3. Now Assume that with 75% (100 - 25) chance No damage is done again by Snowflake. But assume that with 5% chance the damage is done again by Snowflake. Generate a random number again between [0,100]. This time it is 60 (this is damage done by Snowflake to Frago).
4. Now Assume that with 75% (100 - 25) chance No damage is done again by Frago.
5. Total damage to Frago: 50 + 60 = 110
6. Total damage to Snowflake: 25 + 0 = 25

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Frago Loses In Round-2

Money Of Bad's Team is 40

Money Of Good's Team is 10

Team Bad wins the war. The money the team has is 40.