

Mystic Mayhem is a turn-based game between two players. Each player has an army consisting of an Archer, a Knight, a Mage, a Healer, and a Mythical Creature.

Users of the game need to create user profiles, providing a name and a username. The name can be changed at any time, but the username cannot be changed once created. The username is a unique value; no two players can have the same username. If an attempt is made to create a new player profile with an existing username, the user should be notified that the username is already taken and should be prompted to enter a new username. Each user should also have a unique integer userID, which should be given by the system.

Upon creating a profile, a user is awarded 500 gold coins by default. More coins can be earned in combat; when two players combat, the winner gets 10% of the loser's coins. In case of a draw, no coins are exchanged. Further, winning a match increases the XP of a player by 1.

Players can use gold coins to buy their army and equipment.

A player should have exactly one character from each of the categories Archer, Knight, Mage, Healer, and Mythical Creature. A new player will not have an army or equipment; in order to combat, he or she would have to start by creating an army. If they wish to buy a new character at a later point, the existing character in that category can be sold for 90% of its current value. Each character has attack, defense, health, and speed values. The characters available in the game are as follows.

Archers	Knights	Mages	Healers	Mythical Creatures
Name: Shooter Price: 80 gc Attack: 11 Defence: 4 Health: 6 Speed: 9	Name: Squire Price: 85 gc Attack: 8 Defence: 9 Health: 7 Speed: 8	Name: Warlock Price: 100 gc Attack: 12 Defence: 7 Health: 10 Speed: 12	Name: Soothe Price: 95 gc Attack: 10 Defence: 8 Health: 9 Speed: 6	Name: Dragon Price: 120 gc Attack: 12 Defence: 14 Health: 15 Speed: 8
Name: Ranger Price: 115 gc Attack: 14 Defence: 5 Health: 8 Speed: 10	Name: Cavalier Price: 110 gc Attack: 10 Defence: 12 Health: 7 Speed: 10	Name: Illusionist Price: 120 gc Attack: 13 Defence: 8 Health: 12 Speed: 14	Name: Medic Price: 125 gc Attack: 12 Defence: 9 Health: 10 Speed: 7	Name: Basilisk Price: 165 gc Attack: 15 Defence: 11 Health: 10 Speed: 12
Name: Sunfire Price: 160 gc Attack: 15 Defence: 5 Health: 7 Speed: 14	Name: Templar Price: 155 gc Attack: 14 Defence: 16 Health: 12 Speed: 12	Name: Enchanter Price: 160 gc Attack: 16 Defence: 10 Health: 13 Speed: 16	Name: Alchemist Price: 150 gc Attack: 13 Defence: 13 Health: 13 Speed: 13	Name: Hydra Price: 205 gc Attack: 12 Defence: 16 Health: 15 Speed: 11
Name: Zing Price: 200 gc Attack: 16 Defence: 9 Health: 11 Speed: 14	Name: Zoro Price: 180 gc Attack: 17 Defence: 16 Health: 13 Speed: 14	Name: Conjurer Price: 195 gc Attack: 18 Defence: 15 Health: 14 Speed: 12	Name: Saint Price: 200 gc Attack: 16 Defence: 14 Health: 17 Speed: 9	Name: Phoenix Price: 275 gc Attack: 17 Defence: 13 Health: 17 Speed: 19

Name: Sagittarius Price: 230 gc Attack: 18 Defence: 7 Health: 12 Speed: 17	Name: Swiftblade Price: 250 gc Attack: 18 Defence: 20 Health: 17 Speed: 13	Name: Eldritch Price: 270 gc Attack: 19 Defence: 17 Health: 18 Speed: 14	Name: Lightbringer Price: 260 gc Attack: 17 Defence: 15 Health: 19 Speed: 12	Name: Pegasus Price: 340 gc Attack: 14 Defence: 18 Health: 20 Speed: 20
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Equipment can also be bought to improve the characters. Upon buying a piece of equipment, the current value of the character increases by 20% of the price of the equipment. Equipment is of two types: artefacts and armour. Each character can have up to 1 artefact and 1 armour at a given time. By default, none of the characters have equipment. If the player changes the equipment of a character, existing equipment of the same kind would be discarded. Wielding equipment can change the properties of characters. The available equipment is as follows.

Armour	Artefacts
Name: Chainmail Price: 70 gc Attack: no change Defence: +1 Health: no change Speed: -1	Name: Excalibur Price: 150 gc Attack: +2 Defence: no change Health: no change Speed: no change
Name: Regalia Price: 105 gc Attack: no change Defence: +1 Health: no change Speed: no change	Name: Amulet Price: 200 gc Attack: +1 Defence: -1 Health: +1 Speed: +1
Name: Fleece Price: 150 gc Attack: no change Defence: +2 Health: +1 Speed: -1	Name: Crystal Price: 210 gc Attack: +2 Defence: +1 Health: -1 Speed: -1

In combat, the characters take turns to attack, in the order of speed. The person who declares war will take the first turn. The character of that player with the highest speed will attack first, followed by the character of the opposing player with the highest speed, and so on and so forth. Each player will be given 10 turns. A player wins a game by killing all characters of the opposing army. If both teams are standing at the end of 10 turns, the battle is considered to be a draw. The attack of Archers, Knights, Mages, and Mythical Creatures will be targeted on the character of the opposing team with the lowest defence. When one of these characters attacks, the health of the defender will be reduced by $[0.5 * (\text{attack value of attacking character}) - 0.1 * (\text{defence value of defending character})]$. However, a healer's attack is focused on healing one's own army instead of damaging the enemy. Therefore, when a healer attacks, the health of the character in their own army with the lowest health is

increased by $0.1 * (\text{attack value of healer})$. Once a character's health reaches 0, it dies and cannot be revived till the battle ends. After a battle ends, all the characters are restored to their state before the battle.

Among characters with the same speed, the priority order of attacking is as follows.

Healer < Mage < Mythical Creature < Knight < Archer

Among characters with the same defence, the priority order of receiving attacks is as follows.

Mage < Knight < Archer < Mythical Creature < Healer

Each player can select a home ground for their battles. When a player challenges another player to combat, the battle will occur at the home ground of the player who is being challenged.

Home grounds can be of four types: Hillcrest, Marshland, Desert, and Arcane. Further, the characters can be divided into four categories as Highlanders, Marshlanders, SunChildren, and Mystics.

Highlanders: Shooter, Ranger, Cavalier, Zoro, Enchanter, Conjuror, Medic

Marshlanders: Squire, Swiftblade, Warlock, Alchemist, Basilisk, Hydra

Sunchildren: Sunfire, Zing, Templar, Soother, Lightbringer, Dragon, Phoenix

Mystics: Sagittarius, Illusionist, Eldritch, Saint, Pegasus

In Hillcrest, the attack and defence of highlanders increase by 1 while the speed of marshlanders and sunchildren decrease by 1. When attacking in Hillcrest, each highlander can follow each of their turns with a bonus turn with 20% of their attack power.

In Marshland, the defence of marshlanders increases by 2 while the attack of sunchildren decreases by 1. The speed of mystics also decreases by 1.

In Desert, the health of marshlanders decreases by 1 while the attack of sunchildren increases by 1.

In Arcane, the attack of mystics increases by 2 while the speed and defence of highlanders and marshlanders decrease by 1. When attacking in arcane, mystics increase their own health by 10% after each of their turns.

In the game, players can look for opponents to battle. Here, the statistics of another randomly chosen player are displayed, and the player can either challenge them to battle or skip to the next player. It should be noted that only the names of the characters and the XP level of the player are displayed here. Home ground and customization details of characters like armour and artefacts will not be shown.

Calculations of gold coins should be done to the nearest whole number and calculations of attack, defense, health, and speed values should be done to the nearest first decimal place.

Considering the above details, develop an object-oriented implementation for Mystic Mayhem using Java.

Create the following player profile:

Player 1

Name: Gerałt of Rivia
Username: whitewolf
XP: 32
Gold coins: 215
Homeground: Marshland
Archer: Ranger + Chainmail
Knight: Squire
Mage: Warlock
Healer: Medic + Amulet
Mythical Creature: Dragon

Create a player profile of your own and customize it without exceeding the 500 gold coins initially awarded. Challenge whitewolf to battle.

For each turn taken, the player who is taking the turn, the attacker, the defender, and the outcome of the turn should be printed. At the end of the battle, the outcome of the battle should be printed.

Submit a zip file consisting of the following items to Moodle.

- The source code
- An executable file of your program
- A text file consisting of all the outputs of your battle with whitewolf

Absence of any of the above files would result in a 50% deduction of your grade for the project.

The battle outcomes should be printed in the following format.

[Name of Attacking Player] vs. [Name of Defending Player]

Turn 1: [Name of Attacking Player]

[Attacking character] attacks [Defending character]

[Defending Character]'s health: [new health of defender after attack]

[Attacking Character]'s health: [new health of attacker after attack]

(If the defender died, print **[Defending Character] died!**)

(Repeat the part in blue for each turn)

[Winner] won! OR draw

[Attacking Player] XP: [new XP value] gold coins: [new gold coin value]

[Defending Player] XP: [new XP value] gold coins: [new gold coin value]