

ISLAMIC UNIVERSITY OF TECHNOLOGY



SWE 4302

LAB ASSIGNMENT

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Contents

1 Introduction	3
2 Learning Objective	3
3 Secnario	3
3.1 Legends of Aetherfall	3
3.2 Game Mechanics Overview	4
3.2.1 Gameplay Flow	5
3.2.2 Character Stats & Attack Effects	5
4 Task	7
4.1 Input and output example	8
4.2 Java Input Tutorial Using Scanner	9
4.2.1 Step 1: Import the Scanner Class	9
4.2.2 Step 2: Create a Scanner Object	9
4.2.3 Step 3: Take Different Types of Input	9

1 INTRODUCTION

Let's imagine you are currently working on an RPG gaming project called "Legends of Aetherfall". Your team members asked you to make the basic classes with their proper attributes. It is also your job to define the hierarchy between the classes.

2 LEARNING OBJECTIVE

- Design and implement base and derived classes.
- Apply inheritance and method overriding to model complex systems.
- Manage object state using attributes and encapsulated behaviors (methods).

3 SECNARIO

3.1 Legends of Aetherfall

Year 7921 AE

In the war-torn land of Aetherfall, once a cradle of harmony between nature, magic, and the mortal races, darkness stirs once more. After centuries of uneasy peace, the balance has shattered. The skies are veiled in ash, rivers run black with corruption, and the ancient forests whisper of forgotten evils returning.

This world teems with mystical creatures, but amidst the beauty, chaos reigns. The dwellers of Aetherfall now live in fear, oppressed and hunted by growing forces of evil.

Three main factions have risen to fight back against the tyranny:

- **Mages**, scholars of the arcane who harness elemental and spiritual energies. They have the lowest health, comparatively, but have the highest damage potential. They can cast spells on the enemy, which will unleash the highest damage to any enemy.
- **Archers**, swift and silent, trained in forest warfare and beast communion. They have a balanced health and damage capacity. They can shoot a single or multiple arrows at a time. Multiple arrows will damage the enemy twice.
- **Warriors**, resilient and fearless, wielding enchanted steel and the honor of ancient lineages. They have the highest health among all factions. They can shield themselves

from any attack, but the shield will work only if the enemy has less health power than the warrior.

In the dark world of Aetherfall, evil spreads across the land in many forms. From terrifying dark lords to twisted monsters and corrupted soldiers, countless enemies now threaten the people. Each one brings destruction in their own way, leaving fear and chaos wherever they go.

- **Dark Overlord:** Once a wise mage, Kael'tharon gave himself to forbidden magic and became a creature of fire and shadow. Now, he spreads darkness across Aetherfall. He causes great damage by this and damages both power and health. Additionally, he can weaken the next attack.
- **Regional Warlords:** These powerful leaders each control a part of Aetherfall. Their magic is strong, their goals are twisted, and they rule over regions soaked in corruption. They can stop opponent attacks for a certain time.
- **Corrupted Mortals:** Some mortals have joined the enemy willingly, choosing power over honor. They fight with cursed weapons, wear blackened armor, and often lead raids in villages and resistance camps. They can harm any character's health but will not affect power.

Each of these enemy types adds danger and variety to the world of Aetherfall. Whether fighting through a goblin-infested canyon or facing a soul-binding warlord, players must use their skills, magic, and teamwork to survive and bring light back to the land.

3.2 Game Mechanics Overview

In Legends of Aetherfall, every entity—be it a hero or a villain—is modeled as a character. All characters possess the following core attributes and behaviors:

- **Health Level:** Indicates a character's life. If it reaches zero or below, the character dies.
- **Power Level:** Represents the energy needed to perform attacks. Each attack depletes power. A character cannot attack if their power is zero or less.
- **Attack Mechanism:** A standard attack reduces an opponent's health by a fixed amount based on the attacker's current state.
- **Special Move:** Each character has a unique, high-impact ability that causes significant damage to opponents but requires a larger amount of power.

3.2.1 Gameplay Flow

- Users enter the game by choosing a character type: Mage, Archer, or Warrior.
- They can name their character to personalize the experience.
- Players then select a rival from the faction of enemies causing turmoil in Aetherfall: Dark Overlord, Regional Warlords, Mythic Beasts, or Corrupted Mortals.
- A turn-based battle begins. Each side takes turns attacking until one character's health reaches zero or below.
- Players win if they reduce the opponent's health to zero before theirs runs out.

3.2.2 Character Stats & Attack Effects

Mage

- Health: 80
- Power: 100
- Standard Attack Damage: 20
- Standard Attack power cost: 10
- Special Move: castSpell()
- Power Cost (Special): 30
- Special Effect: Deals 40 health damage to opponent

Archer

- Health: 100
- Power: 100
- Standard Attack Damage: 15
- Standard Attack power cost: 8
- Special Move: quickShot()
 - Power Cost (Special): 25

- Special Effect: Deals 30 health damage to opponent
- Special Move: multiShot()
 - Power Cost (Special): 50
 - Special Effect: Deals 60 health damage to opponent

Warrior

- Health: 120
- Power: 100
- Standard Attack Damage: 12
- Standard Attack power cost: 5
- Special Move: mightyStrike()
- Power Cost (Special): 35
- Special Effect: Deals 35 health damage to opponent

Dark Overlord

- Health: 200
- Power: 150
- Standard Attack Damage: 25
- Standard Attack Power Cost: 17
- Special Move: summonDarkness()
- Power Cost (Special): 40
- Special Effect: Deals 50 health damage to opponent and will weaken the affect of the next attack by half

Regional Warlord

- Health: 130
- Power: 110

- Standard Attack Damage: 20
- Standard Attack power cost: 10
- Special Move: toxicAura()
- Power Cost (Special): 35
- Special Effect: Deals 30 health damage and next 20 seconds the user cannot attack.

Corrupted Mortal

- Health: 90
- Power: 90
- Standard Attack Damage: 18
- Standard Attack power cost: 9
- Special Move: curse()
- Power Cost (Special): 20
- Special Effect: Deals 25 health damage

4 TASK

- Implement the classes with proper hierarchy
- Add a unique ability for each type of character class.
- Implement a method to check if a character is alive.
- Display each character's health after every action.
- The game input and output should match the given example as much as possible.

You are tasked to submit your Java project in the classroom by **11:59 PM on 15th June 2025**. On the next page, you can see the sample example with instructions on how to take inputs in Java. For further help, try to take help from the book attached with the assignment.

4.1 Input and output example

```
1 Choose a character: 1. Mage 2. Archer 3. Warrior
2 > 1
3 You've chosen Mage
4 Enter your mage name
5 > Elara
6 Choose a villain to fight against:
7 1. Dark Overlord
8 2. Regional Warlord
9 3. Corrupted Mortal
10 > 1
11 Elara the Mage enters the world of Aetherfall!
12 DarkOverlord rises to spread chaos!
13 Battle Start!
14 > attck
15 Elara used Attack on DarkOverlord
16 Elara caused 20 damage.
17 ----- Game Stats-----
18 Elara - Health: 80, Power: 90
19 DarkOverlord - Health: 180, Power: 150
20 Enemy Attacks
21 DarkOverlord used Attack on Elara
22 DarkOverlord caused 25 damage.
23 ----- Game Stats-----
24 Elara - Health: 55, Power: 90
25 DarkOverlord - Health: 185, Power: 133
26 > special
27 Elara used Special on DarkOverlord.
28 Elara caused 40 damage.
29 ----- Game Stats-----
30 Elara - Health: 55, Power: 60
31 DarkOverlord - Health: 145, Power: 133
32 DarkOverlord used Special on Elara.
33 DarkOverlord caused 50 damage and weakened next 3 attacks.
34 ----- Game Stats-----
35 Elara - Health: 5, Power: 60
36 DarkOverlord - Health: 145, Power: 93
37 > Attack
38 Elara used Attack on DarkOverlord.
39 Elara caused 10 damage.
40 ----- Game Stats-----
```



```
41 Elara - Health: 5, Power: 50
42 DarkOverlord - Health: 135, Power: 93
43 DarkOverlord used Attack on Elara
44 DarkOverlord caused 25 damage.
45 ----- Game Stats-----
46 Elara - Health: -20, Power: 50
47 DarkOverlord - Health: 135, Power: 76
48 -----Results-----
49 DarkOverlord wins the battle!
50 Elara the mage has been defeated!
```

Listing 1: Sample input output for the game

Here, the lines that start with the '>' sign are the input from the user. Other lines should be generated from the system.

4.2 Java Input Tutorial Using Scanner

4.2.1 Step 1: Import the Scanner Class

To use Scanner, you need to import it from the java.util package.

```
1 import java.util.Scanner;
```

4.2.2 Step 2: Create a Scanner Object

You create a Scanner object using,

```
1 Scanner scanner = new Scanner(System.in);
```

4.2.3 Step 3: Take Different Types of Input

Here are examples of taking different types of input:

- Read a String (one word)

```
1 System.out.print("Enter your name: ");
2 String name = scanner.next(); // Reads one word
3 System.out.println("Hello, " + name + "!");
```

- Read a Full Line

```
1 System.out.print("Enter your full name: ");
2 scanner.nextLine(); // Consume leftover newline
3 String fullName = scanner.nextLine();
4 System.out.println("Welcome, " + fullName + "!");
```

- Read an Integer

```
1 System.out.print("Enter your age: ");
2 int age = scanner.nextInt();
3 System.out.println("You are " + age + " years old.");
```
