

College of Engineering
Computer Science & Eng. Dept.
Course: COE 312 Software Design
for Engineers (Lab)
Date: 17th September 2020
Location: Online



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Homework 1: Java Programming

➤ **Objectives:**

- To create Java classes (variables, constructors, methods).
- To practice using arrays, switch, loops, String methods.
- To practice using inheritance, interfaces and abstract classes.

Hand in: *One team member needs to* upload on iLearn:

- one clear and organized solution document (following the template provided).
- The Java files (attach the entire project with all the classes zipped).

You should also add your solution to your GitHub repository.

Due Date: Sunday 27th September, 11:59pm (5% per day will be applied on late submissions).

➤ **Useful resources:**

- **Java Tutorial:** <https://www.w3schools.com/java/default.asp>
- **Lecture** – Introduction to Java.
- **Labs:** Lab 2, 3 and 4.
- **GitHub repository** with the code discussed during lectures



Hogwarts School of Witchcraft and Wizardry - The Marauder's Map

The Marauder's Map is a magical document that reveals all of Hogwarts School of Witchcraft and Wizardry. The map was created by Remus Lupin (Moony), Peter Pettigrew (Wormtail), Sirius Black (Padfoot), and James Potter (Prongs) while they were attending Hogwarts.

Your task is to create in Java a *Zork*-like text adventure game simulating the use of the marauder's map. The player inputs commands in the console to navigate around Hogwarts and to interact with characters or objects in each location.



The map shows 3 locations that the player can go to. In each location, the player can talk with 1 character and use 2 objects. The locations' details are as follows:

1. **Dining hall:** The dining hall is the biggest open area inside Hogwarts. In the dining hall, the player finds Professor **Dumbledore**. The player can use the **sorting hat** to get sorted *randomly* into one of the houses (Gryffindor, Hufflepuff, Ravenclaw and Slytherin), and hold **food** to eat.
2. **Library:** Once the academic year starts, students spend a lot of their time in the school library. Amongst those students that the player can talk to is **Hermione**. In the library, the player finds a **book** they can read, and a **quill** they can write with.
3. **Potions Classroom:** Potions is one of the core subjects that first year students are required to study. In the potions class there is Professor **Snape** who teaches the subject. The Potions Classroom is full of equipment and material that the player can use including a **cauldron** to make potions, and a **potion** to drink that casts a magical spell.

Based on the description above:

- Create appropriate Java classes to model the different locations *Dining Hall*, *Library*, *Potions Classroom* with appropriate attributes, methods and constructors. You should also consider the relationships between these classes and make use of interfaces and abstract classes.
- Each location has a description, set of characters and set of objects. Each object has `use()` method that prints what the object does as described above. Each character has `talk()` method that prints what the character says, i.e. the objects that are in the current location. These methods are executed upon interacting with the objects/characters.
- The player can use the *look* command to know the location's description and character present and *walk* command to move to another location (*see sample output below*).
- Create a Main class with the main method. Running the program prints the opening statement (*see sample output below*) then waits for user input. The next move depends on the input.
- The game starts when the player types "*I solemnly swear that I am up for no good*" and ends when s/he types "*mischief managed*".
- If the player enters a non-existent object or character or command in a particular location, it should prompt the player that it is invalid.
- The literal text is not important in this assignment, be creative and any relevant text is fine (*see sample output below*).

Sample Output:

"Messrs Moony, Wormtail, Padfoot and Prongs Purveyors of Aids to magical Mischief-Makers are proud to present THE MARAUDER'S MAP"

Say the magic phrase to reveal the map.

> I solemnly swear that I am up for no good

The Entrance

You arrive at the doors of Hogwarts. The door on the north wall leads to the dining hall, the door to the east leads to the Potions class, and the door to the west leads to the Library.

>walk north

You have entered the dining hall.

>look around

The dining hall is the biggest open area inside Hogwarts. Professor Dumbledore is in the hall to welcome new students.

>talk to Hermione

This character is not in the room...try again!

>talk to Dumbledore

Welcome to the dining hall! Interact with the sorting hat to be sorted into a house, then enjoy the food served in the hall.

>use sorting hat

Gryffindor!

>mischief managed

Hiding map contents...end.