JAVA PROGRAMMING COURSE (SWE2023)

FALL SEMESTER 2023

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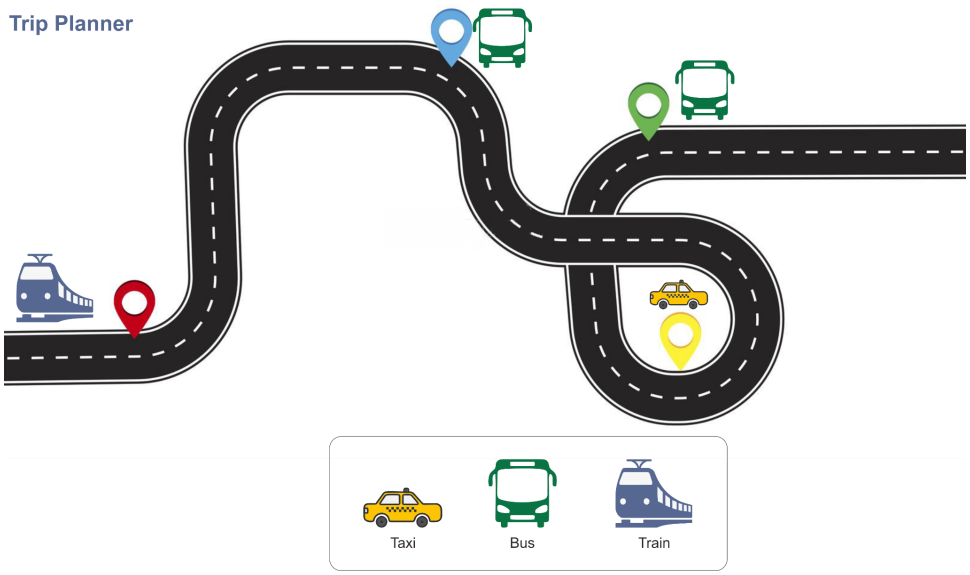
COLLEGE OF SOFTWARE

Midterm Assignment

In this midterm assignment, create a Java program called ***[Trip planner Program]*** to help students to plan their trips! Guidelines for submission format are given at the end of the assignment file.

Trip planner Program

The main purpose of the application is to plan the transportation methods for your trip and calculate the trip's overall cost. For example, In the following figure, we have a trip that includes a train, bus, taxi, and bus to reach your destination.

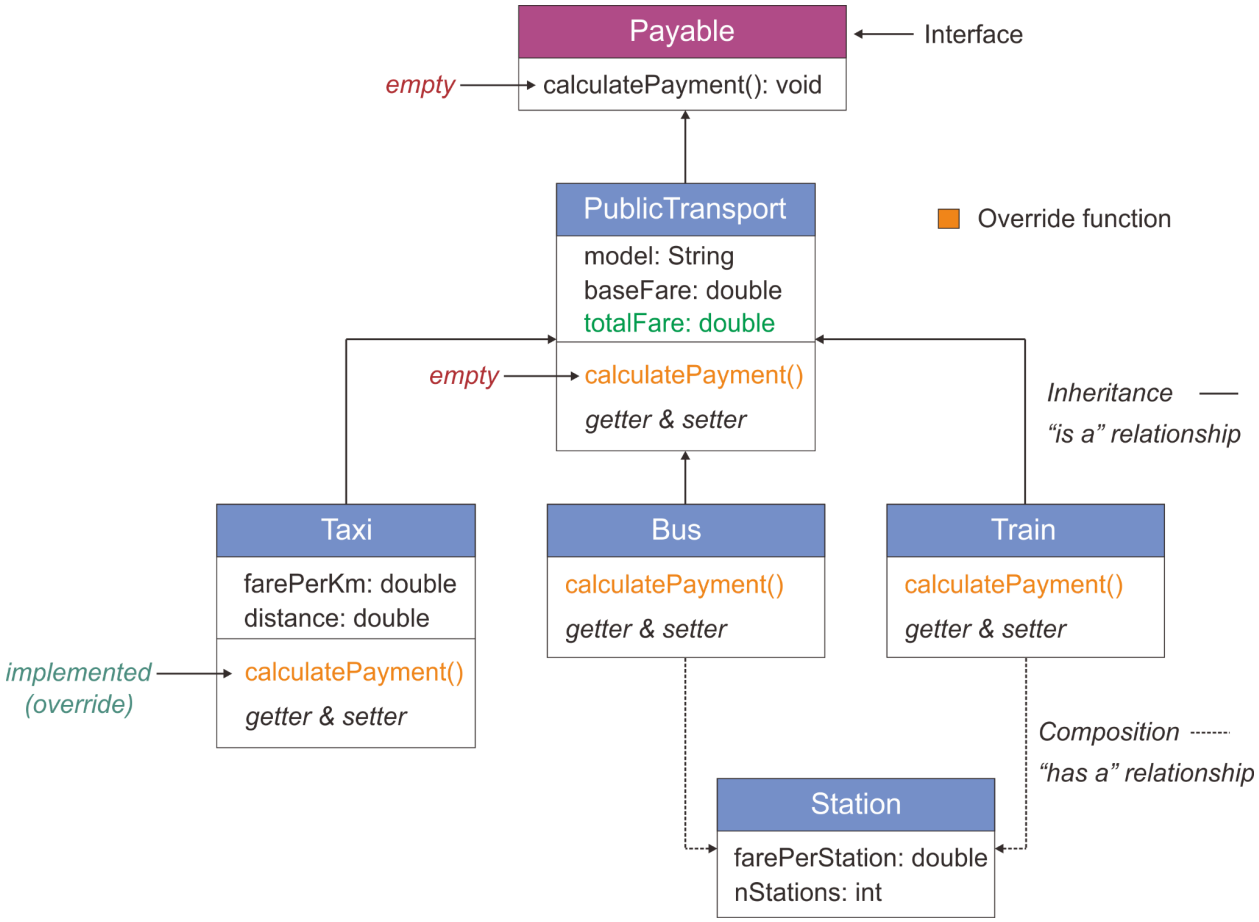


Taxi

Bus

Train

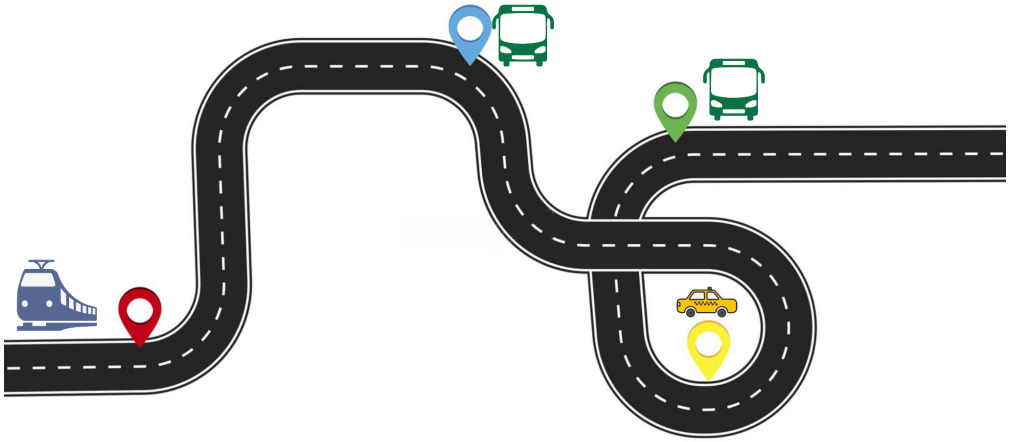
We have included with the midterm assignment a video for the application output. The program includes one interface called **Payable**. There is also a super abstract class called **PublicTransport** with three subclasses: **Taxi**, **Bus**, and **Train**. Finally, the program must include the **Station** class. Provide constructors for each class. Provide a set and a get method for **all** instance variables. Create all interfaces and classes with the given variables and methods.



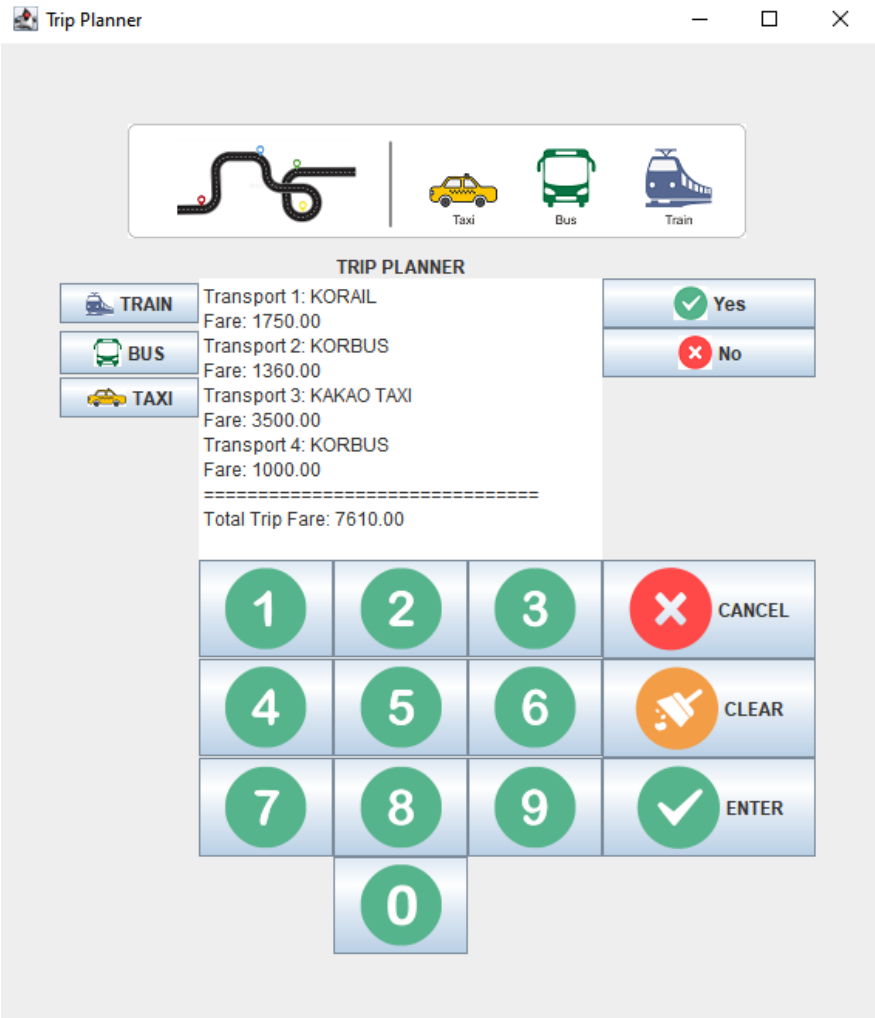
Program Flow:

For getting the whole program description, please watch the attached video.

- In the video, there are 4 transfers (as shown in the image below: train -> bus -> taxi -> bus):



- The user can cancel the trip in the middle (as shown in the video). If the user cancels the trip, the program prints “Cancelled” and create a new plan. (first part of the video)
- If the user does not cancel the trip and finishes entering all transfer information (second part of the video), at the end the program prints the total trip fare with a detailed description and exits the program.



Instructions:

For calculating **taxi fare**: **total fare** = ***(base fare)*** + ***distance * (fare per km)***

For calculating **bus fare**:

If the number of stations is less than 5: **total fare** = ***(base fare)***

If the number of stations is more than 5:

total fare = ***(base fare)*** + (***(number of station)*** - 5) * ***(fare per station)***

Calculating **train fares** is the same as calculating bus fares.

Requirements (your program has to contain the following topics):

- GUI
- Inheritance
- Inference
- Polymorphism
- Composition
- List (for listing objects of transport)
- Following all requirements (creating all classes, interface, variables, and methods)
- Coding style (meaningful naming variables and methods)
- Correctness of code (should be run without errors)
- Comments (for important lines)

Note: all images and icons are in the "assets" folder. You can use your own custom icons as well.

Hints:

- You can use flag to control the states:

```
} else if (state == 8) {
    welcomeTextPane.setText("Thank you for banking with us! \npress ENTER...");
    state = 1;
}
```

- For getting only digits from the text field, you can use the following code:

```
String text = welcomeTextPane.getText();
int pin = Integer.parseInt(text.replaceAll( regex: "[^0-9]",  replacement: ""));
```

Submission format: Submit the whole project folder as a zip file with the same video as the attached video. All the files should be submitted as a **zip** file.

Name of zip file: {student ID}_{Student name}_midterm_assignment.zip

Example: 2020712837_Frank_Thomas_midterm_assignment.zip

Important: Plagiarism is strictly prohibited. If there is any plagiarism found in the code, you will be given an "F" for the midterm assignment evaluation.

Since this is a midterm assignment, questions should be for issues or missing info, and you can ask as usual in the discussion section or by contacting the TAs directly.

Good luck!