JAVA PROGRAMMING COURSE (SWE2023)
SPRING SEMESTER 2022

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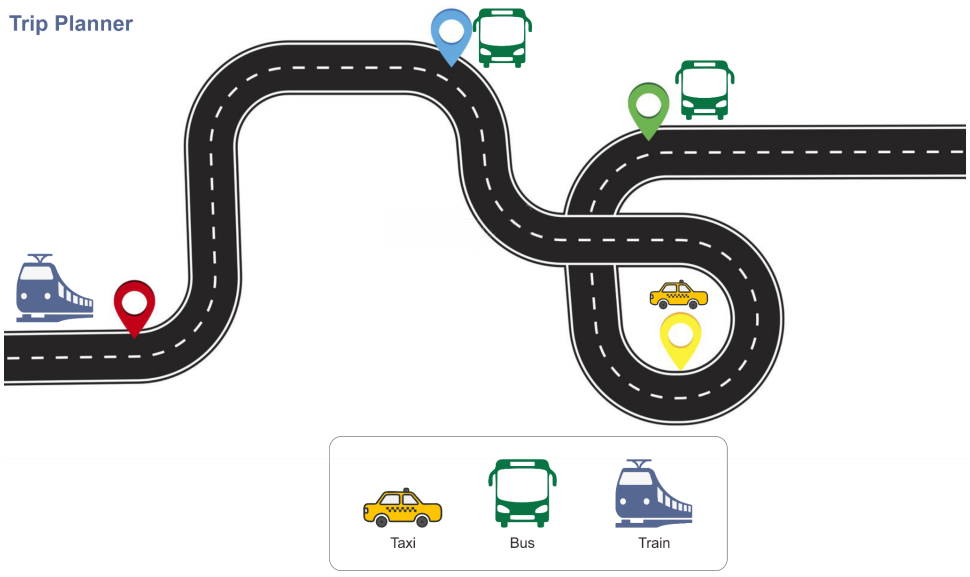
Assignment 3

In this 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.

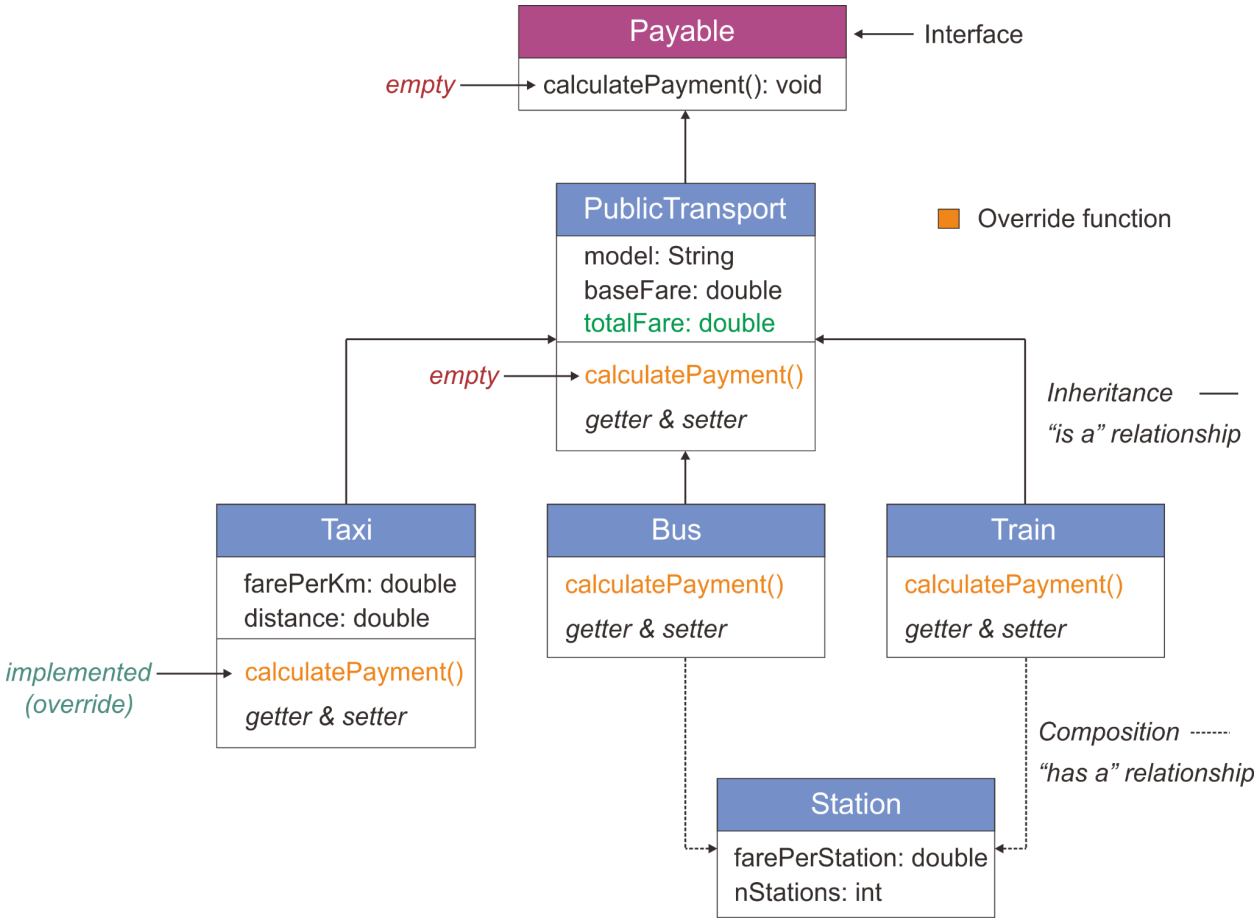


Taxi

Bus

Train

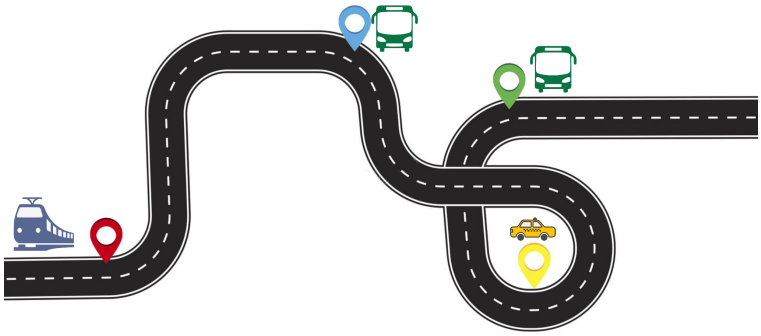
We have included with the assignment a video for the application output. The program includes one interface called **Payable**. There is also a super abstract class called **PublicTransport** with three subclasses: **Taxi**, **Bus**, and **Train**. Finally, the program must include the **Station** class.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



Program Flow:

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

- When the user starts the program, the program asks for a number of transfers to complete the trip.
- 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 “Trip is canceled” and exits the program. (first part of the video)
- If the user does not cancel the trip and finishes entering all transfers information (second part of the video), at the end the program prints the total trip fare with a detailed description and exits the program.

```
======= Trip Plan =======
Transport 1: Korail
Fare: 4050.00
Transport 2: Korbus
Fare: 6200.00
Transport 3: KakaoTaxi
Fare: 10000.00
Transport 4: Korbus
Fare: 1200.00
================================
Total Trip Fare: 21450.00
==============================
Info: if the number of stations are more than 5, there will extra charge for each extra stations.
===== Have a wonderful trip! =====
```

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 number of stations more than 5:

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

For calculating **train fare**, same with calculating bus fare.

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

- 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)

Grading:

- If you complete all requirements, you will get a max of 90%.
- Other 10% for creative extra functionalities.

Submission format: Submit **seven separate files (only .java files, not the whole project folder)**. Submitting files: Main.java, Payable.java, PublicTransport.java, Taxi.java, Bus.java, Train.java, and Station.java. Files must include the implementation code of each task and comments for important lines of code to explain the purpose. All the files should be submitted as a **zip** file.

Name of zip file: {student ID}_{Student name}_assignment3.zip

Example: 2020712837_Frank_Thomas_assignment3.zip

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

If you have any questions about the assignment, you can ask in the discussion section of the week or contact the TAs directly.

Good luck!