ONT401 Assignment   **Due Date 17th May 2024 before 23:55**

Assignment Rules

- You are required to work in groups of not more than 5 students
- Only 1 group member should submit.
- All group members' details should be provided in the assignment.
- Late assignment submissions will lose 20% daily.

Assignment Specifications

You have been tasked to design console application and program a vehicle assembling application which will allow ABC systems to assemble certain vehicle parts. Vehicle owners can also choose to include some specs on the vehicles any time they wish to. ABC Systems works with Motor bikes, light vehicles, as well as heavy vehicles. ABC systems is provided with the vehicles left only to choose carrier capabilities, engine, as well as towing capabilities to vehicles that can tow. These vehicles come with without sound systems, Wi-Fi connection in the vehicle, and a driver assist camera for reversing. ABC systems has technicians for motor bikes, and technicians responsible for both light motor vehicles as well as heavy motor vehicles. If a vehicle has a Wi-Fi connection installed in it, then the technicians can be able to perform diagnostics or provide daily news about specials at ABC systems, and updates of the sound system if a vehicle includes one.

In terms of the carrier capabilities, engine, and towing capabilities for vehicles, each vehicle should leave the assembly line with these defined. The options available for these are as follows:

Carrier capabilities:

- Good and Driver
- 2 people max, and bag
- 5 people max and few luggage
- 20 people max
- 65 people max

Engine:

- Small
- Medium
- Large
- Extra Large

Towing capabilities:

- Can Tow
- Cannot Tow

If a user requires additions such as a sound system, Wi-Fi connection or an assist camera, then the user can be provided a slip with the information and price for the work done. Remember that hourly rates depend on the technicians and is as follows:

Motor Bike Technician:

- Adding Sound System: R1000

- Adding Wi-Fi: R750
- Adding Camera: R200

Light Motor Technician:

- Adding Sound System: R1200
- Adding Wi-Fi: R950
- Adding Camera: R400

Heavy Motor Technician:

- Adding Sound System: R1400
- Adding Wi-Fi: R1000
- Adding Camera: R600

Once these have been added, the vehicles should include these, and the description of the vehicles should include the items which have been included in the vehicles.

For the development of this application to be success, you are advised to make use of design patterns. Since you have learned about the Strategy, Observer, and the Decorator pattern. You are required to use this knowledge to align this scenario with the pattern. Remember that these patterns should be integrated to come up with a single solution. This means that an integrated class diagram and a description aligning the scenario to the class diagram is necessary and should be submitted as part of the assignment. The code snippets for the application should also support the class diagram and submitted with it.

Once this is done, you are required to create a document with the code snippet and class diagram with the descriptions in it. In submission, you are required to submit a single .pdf document with the code snippet, class diagram, and the discussion for aligning the patterns. **Please do not forget to include your name, surname as well as student numbers in the document.**

NB: **Marks will be deducted for incorrect submissions.**