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COE312 –

**The quiz open book and notes and you can use the Internet. You are not allowed to consult other individuals or your classmates.**

PLEASE UPLOAD YOUR ANSWER USING THIS **WORD** FILE. DO NOT UPLOAD ANY ZIPPED OR PDF FILE. ONE WORD FILE ONLY.

The question(s) have been written in a manner such that it is not possible for two students to have the same solution. Therefore, please refrain from the temptation of copying code and changing order of and names of variables, etc. AUS code of conduct will be strictly enforced, and no violation will be tolerated as per AUS policy. Please note that the AUS code does not discriminate between who copied from whom so it is not advisable to share your solution.

**Q1. (20 points)** A traffic signal follows a cyclic pattern of red (🔴), yellow (🟡), and green (🟢) lights, with each light lasting **500 milliseconds**. Adjacent to the road, a control panel with a button is provided to facilitate pedestrian crossing. The control panel automatically triggers the pedestrian signal (🚶) every 3 seconds since the last pedestrian activation. Pedestrians also have the option to manually press the button,which triggers immediate activation of the pedestrian signal if the last activation occurred more than 1 second ago; otherwise, it waits for the next cycle of the pedestrian signal to allow pedestrians to cross.

Implement the above scenario using Java classes and **Command design pattern**. Synchronize the shared resources where required.

You must run and provide output on the following program (without any changes to the program). You are not allowed to make any changes to this program. **Ensure that your output closely aligns with the expected output in terms of content and length.**

public class Main {

public static void main(String[] args) {

// TODO Auto-generated method stub

TrafficSignal tf = new TrafficSignal();

Command pd = new Pedestrian(tf);

ControlPanel cp = new ControlPanel();

cp.addCommand(pd);

try {

Thread.sleep(5000);

System.out.println("Pedestrian on the road");

cp.executeCommand(0); // pedestrian manually pressed the button

Thread.sleep(100);

System.out.println("Pedestrian on the road");

cp.executeCommand(0);// pedestrian manually pressed the button

}catch(InterruptedException e) {

}

}

}

Expected Output:

Red Signal 🔴

Yellow Signal 🟡

Green Signal 🟢

Red Signal 🔴

Yellow Signal 🟡

Green Signal 🟢

Pedestrian turn🚶

Red Signal 🔴

Yellow Signal 🟡

Green Signal 🟢

Pedestrian on the road

Pedestrian turn🚶

Pedestrian on the road

Red Signal 🔴

Yellow Signal 🟡

Green Signal 🟢

Red Signal 🔴

Yellow Signal 🟡

Pedestrian turn🚶

Red Signal 🔴

Yellow Signal 🟡

Green Signal 🟢

Red Signal 🔴

Yellow Signal 🟡

Pedestrian turn🚶

Red Signal 🔴

Yellow Signal 🟡

Green Signal 🟢

Red Signal 🔴

Please provide 1) formatted code and 2) screenshots of your running program. Not providing a screenshot (with or without errors) will limit your score to below 3/10.

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| **Solution: (Paste formatted code in this box).** |

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| **Solution: (Paste the screenshot in this box).** |

**Grading Rubric:**

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| **0-3** | **4-6** | **7-8** | **9-10** |
| * The program does not compile or run but there is some notion of a solution OR * No screenshot is provided. | * Some of the program works but not fully. * Bad design practices have been used. | * The program partially matches the output provided. * Clean design practices have been followed. | * The program exactly matches the output. * Clean design practices have been followed. |