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EECS 3311
Section B
First Software Project
TA: Naeiji Alireza

Introduction PART I (introduction): up to 1 page, worth 10 pts

o Explain what the software project about and what are its goals: **2 pts**
o Explain the challenges associated to the software project: **2 pts**
o Explain the concepts (e.g., OOD, OOD principles, design patterns) you will use to carry out the software project : **4pts**
o Explain how you are going to structure you report accordingly: **2pts.**

This is the first software project of this course and it is essentially a GUI that displays shapes and sorts them. The main goal of the project is to be able to display the shapes and sort them based on their surface and display the sorted shapes based on their sorting order. Another goal is to have two buttons; one to display shapes (circles, squares or rectangles) and the other is to sort them by their surface. The sorting method should use any of the following algorithms: quick sort, bubble sort or insertion sort. Additionally, each shape should have a colour, be able to compute its own surface and should have a method able to draw itself. Some of the challenges that came up during the development of the project was creating the buttons and adding the action listeners. Another challenge was trying to implement the sorting algorithm. As for the OOD principles, I used encapsulation, inheritance and polymorphism for all the necessary data (shapes and their properties). I am going to follow the report criteria.

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Design Part II (design): up to 3 pages, worth 45 pts

o Create a first UML class diagram of your system **(use at least two design patterns)**, add the corresponding figure in the report and comment its elements: **(25 pts)**

❖ This corresponds to step 4 of the OO analysis and design workflow **(mandatory)**

❖ Feel free to complete steps 1, 2 and 3 as a preliminary step before completing step 4 **(optional).**

o Use OO design principles in your class diagram **(10pts):**

❖ Explain in your report how you have used them: name the corresponding classes, interfaces, and if possible most relevant methods

o Propose a design alternative by creating a second UML class diagram **(10pts):**

❖ Does this second class diagram yields a better design than your first class diagram? Explain why.

As for the OOD principles, I used encapsulation, inheritance and polymorphism for all the necessary data (shapes and their properties). I had the base shape class and then the rectangle class, circle class and square class all extended the parent class which was the shape class. I also used setters and getters for all the attributes of the shapes.

Implementation Part III (implementation): up to 3 pages, worth 35 pts

o Describe the algorithm of the sorting technique you have used to sort the shapes: **10 pts**

o Describe how you have implemented and compiled all the classes of your class diagram in Java (specify if you have implemented the first or the second class diagram): **15 pts**

o Specify the tools you have used during the implementation: version of Eclipse/IntelliJ or of another IDE use to write code and run it, version of JDK, etc.: **3 pts**

o Take a snapshot of the execution of the code (i.e., of the interface) and comment it in the report: **2 pts**

o Create a short video (2 to 3 mins) showing how to launch your application and run it: **5 pts**

❖ The code should be able to run without triggering exceptions

❖ Turn your camera off when recording the video!

I used Eclipse 2020 to write my code and run it.

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Conclusion Part IV (conclusion): up to 1 page, worth 10 pts.

Explain the following in your conclusion:
o What went well in the software project? **3 pts**
o What went wrong in the software project? **3 pts**
o What have you learned from the software project? **2 pts**
o What are your top three recommendations to ease the completion of the software project ? **2 pts**

Some of the things that went well in the project were the implementation of the shapes and all their properties and the buttons on the GUI. Some of the things that went wrong were the implementation of the sorting algorithm and displaying the shapes. I learned a lot about making GUI's and the different components needed to make one. Some recommendations to ease the completion of the software project would be going through how to make a basic GUI, some logic behind the sorting algorithms and lab time where we ask the TA's questions.