OOSE Team Work 1:

Due by 11/10/2019 (Oral presentation on 11/13/2019, 11/14/2019)

Instruction:

- The team leader shall properly assign tasks to each of your group members and coordinate team coordination.
- A **zip file** containing questions and answers, executable code, a participation summary of team members, and ppt shall be submitted to Yuntech E-Learning Platform. The teaching assistant (TA) will set the ppt file of each group be downloadable by other groups.
- Another **print file** containing questions and answers, fractions of significant code should be placed in the instructor's mailbox at the office.
- The team work will be evaluated based on completeness and correctness of the design. The final grade will be given A, B, C, D, or E. Each team should grade your team members into three levels as **H, M**, and **L**. **H** means students actively participate in discussion and contribute in the tasks heavily in coding or take part in some pieces of coding along with other tasks. **M** means students actively participate in discussion and contribute in the tasks not related to coding. **L** means students show little interest in the teamwork.

Project design description:

At present, many e-commerce websites allow users to use the SMS one-time password OTP authentication mechanism to complete online service transactions. However, if the hacker has invaded the client or other factors, it may be intercepted to obtain the OTP verification code for various transactions. Therefore, the traditional one-time password (OTP) is no longer safe. The new generation of AOTP (Active One-Time-Password) has added a dual identification mechanism based on the general mobile phone and the chip card. The user actively transmits a one-time password or verification code to a dedicated telecom short code service provider. In order to complete the certification and complete the complete service transaction, it becomes the safest and most convenient payment authentication mechanism for mobile e-cash. With the mobile phone and the chip card as multiple authentication mechanisms, it is necessary to manually confirm and return the security authentication mechanism to prevent automatic control by malicious programs.

Based on the e-payment project you proposed for the SA course, please apply suitable design patterns to refactor your previous design. And do the following tasks:

1) To have a user-friendly GUI, please create a Window containing a set of pane objects. It may include TextPane, ListBox, Button, and so on. Display apply Façade, Mediator to design the GUI. In addition to this, please also apply another 3 patterns to your project.
2) You need to evaluate the pieces of design quality by using object-oriented quality metrics (WMC, DIT, NOC, CBO, RFC, LCOM). The figure shall be drawn like the provided references below. You shall explain each metric by giving examples of your design.
3) Create Junit test cases and Junit test suite to test one selected class.
4) Conduct part of the software testing including white box and black box.
5) Please analyze the invocation chains of your design.
6) Based on the metrics result, please identify places that need improvement, Selecting an improvement strategy,

References:

The matrix of design quality can be displayed like the following figures.

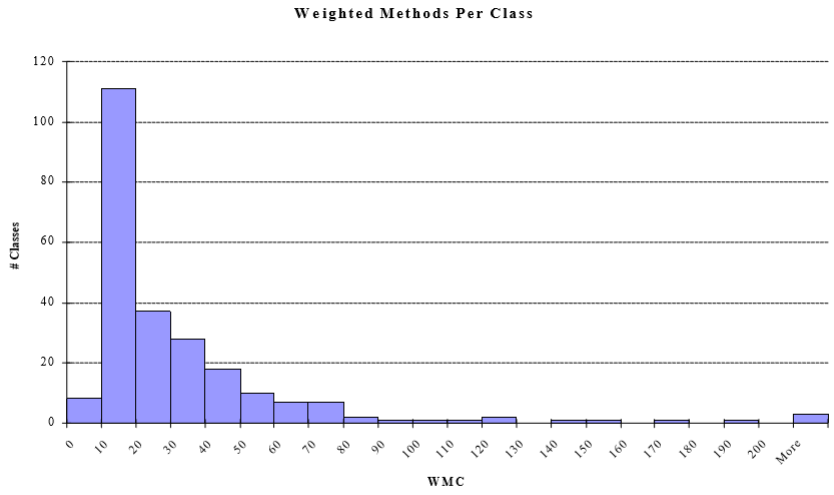

Figure 7: Weighted Methods Per Class

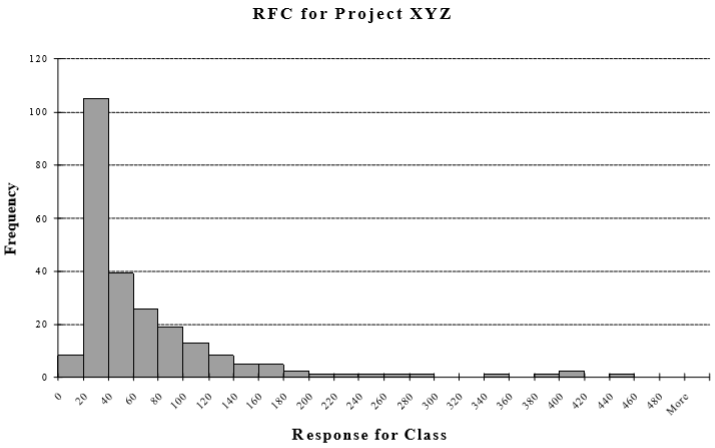

Figure 8: Response for a Class

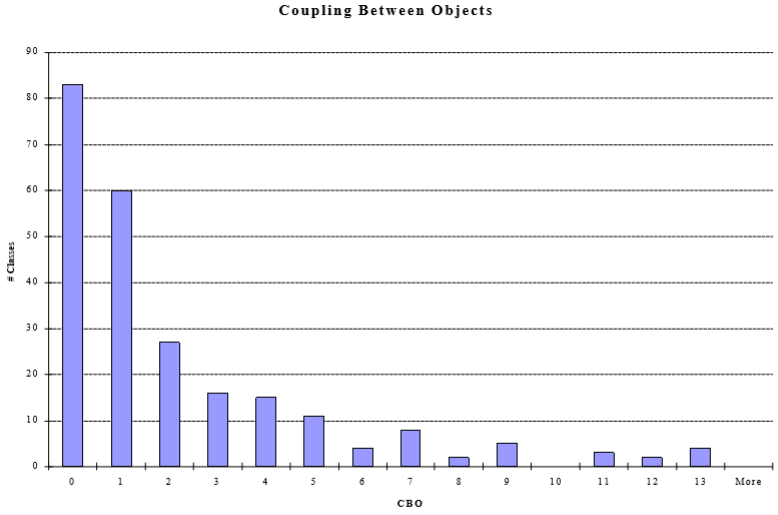

Figure 9: Coupling Between Objects

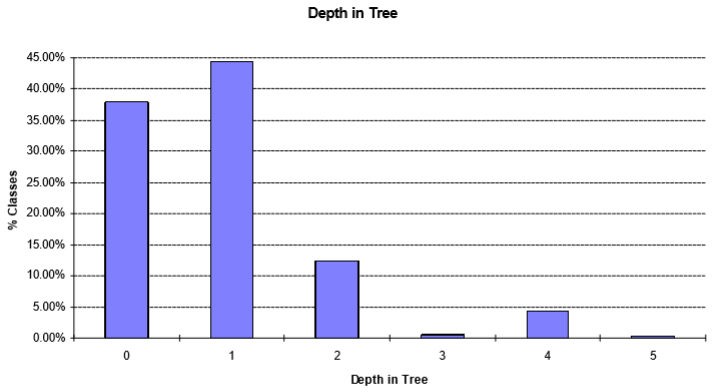

Figure 10: Depth in Tree (DIT)

The figure of Number of Children (NOC) is similar to DIT.