CS132: Software Engineering
HW1: UML Practice

In this homework we will use UML to describe the functionality of a system and specify its interactions with users. Please try to answer all the questions in English. When drawing UML diagrams, please use software recommended in class and submit a .pdf report with short description for each diagram. Hand-drawn diagrams will receive penalties depending on their clarity.

Background

Your grandma is visiting you at ShanghaiTech and she's interested to know your life on campus. You showed her your campus card (校园一卡通) and she would like to know how it works. In this exercise, use UML diagrams to illustrate to your grandma what you can do with the campus card.

Task 1: Class diagram (5pt)

People play different roles on campus and their campus cards can do different things while sharing some common functionalities. In this task, use class diagram to illustrate these roles (Student, Employee, Public service staff, Professor, etc.) and their relationships. Make sure to add attributes and actions to each class.

Note: The major info in the Class diagram needs to be consistent with other diagrams.

Task 2: Use case diagram (5pt)

The campus card is issued by Public Service. The cardholder can benefit from a large variety of services. Draw an use case diagram to illustrate what you can do with your campus card, from 1) a student's point of view and 2) a public service staff point of view. Make sure to illustrate the relationships among use cases.

Note: Please try to list all major use cases.

Task 3: Activity diagram (5pt)

The campus card itself is also a bank card. Draw an activity diagram to illustrate the process for you to use ATM to transfer money from your card. Make sure to use Swim Lane to group activities for different roles. Note that You should at least consider the case of incorrect PIN and insufficient balance/invalid transactions.

Task 4: Sequence diagram (5pt)

Draw a sequence diagram to illustrate the interactions among you, Alipay, and the campus card database when you add fund to your campus card. Make sure to consider exceptions.

Submission

The deadline of this homework is March 31st at 23:59. Please submit a .pdf file with name "CS132_HW1_YourName.pdf" electronically on BlackBoard.