CPT203 23-24 FINAL

Section A (70 marks)

Question A.1 (8 marks)

Please provide a brief explanation of the four fundamental activities involved in software processes.(来自于Week1)

specification：Make the needs clear

development: Build the software

validation: Test weather it works and weather it fits the needs

evolution: improve the expression or add new function

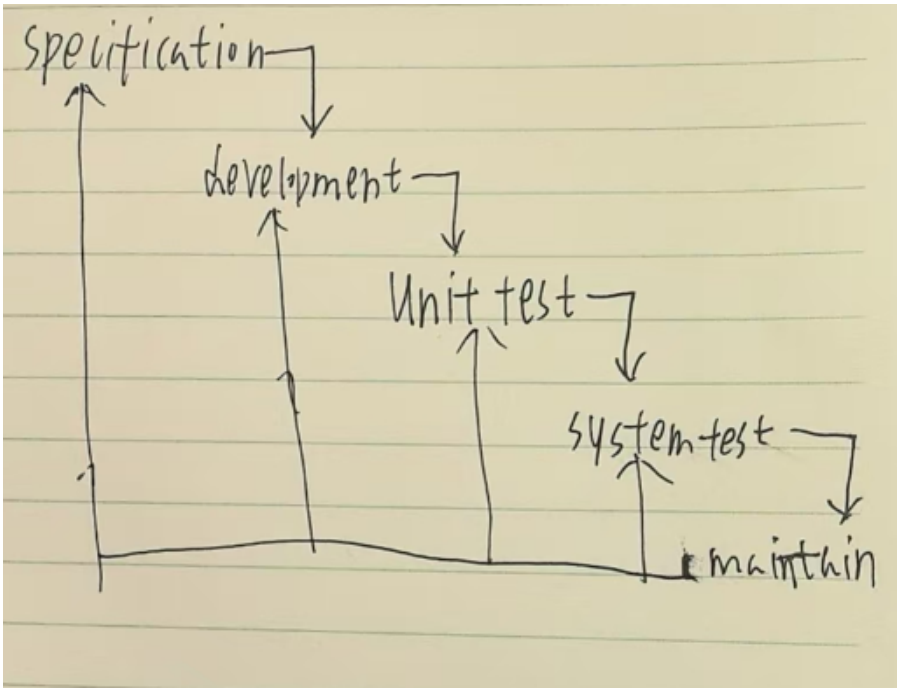
Question A.2 (8 marks)

Compare the key differences between plan-driven processes and agile processes.

The difference is plan-driven requires all actions needs to be scheduled and should not be able to do next step before the current one is finished, and do not be able to rapidly action with new change, while agile method could do so. Also, plan-driven could save more resources due to the strick rules of order, while aglie can not.

Question A.3

Please provide a diagram illustrating the flow of activities in the waterfall software process model.



Question A.4 (10 marks)

A management team is considering to invite an IT company to develop a new software to schedule the passenger lifts in tall buildings. It aims to increase the efficiency of operation during the peak-time. Will you choose the agile method, at the leader of the IT company? Please provide three reasons to support your decision.

这里两种均可，我更倾向于用瀑布模型：

I won't choose agile method, cause the requirment seems do not have many change and is very clear. Also for such kinds of project, plain drive could offer a cheaper cost . Thus I would not use it.

也可以说你要用他：

I will use agile method, cause I wish to improve the efficiency within the working time. Which means some change of the whole structure might need to be make, and agile method could better deal with it, also it could let the customer directly involed in development, that makes the whole process be more fit with the needs.

Question A.5 (4 marks)答案来自week5

List high-level activities in the requirement engineering process.

Requirement discovery, Requirement Specification, Requirement Classification, Requirement Validation

Question A.6 (6 marks)

Suppose you are developing a restaurant management system. Within this system, there is a class called OrderProcessor, as shown below, responsible for handling customer orders. It has been identified that the code exhibits low cohesion. Your task is to rewrite the code to improve the cohesion.

```
public class OrderProcessor {
    public void takeOrder(Order order) {
        // Logic for taking customer orders
    }

    public void prepareOrder(Order order) {
        // Logic for preparing orders in the kitchen
    }

    public void serveOrder(Order order) {
        // Logic for serving orders to customers
    }

    public void billCustomer(Order order) {
        // Logic for generating and presenting bills
    }
}
```

把现有class拆掉，然后把里面的方法改成class即可

Question A.7 (6 marks)

Many web-based systems utilize MVC as the foundation for interaction management. Please provide a list of three components involved in this pattern and explain their respective functionalities.

Model：The block directly deal with the data and logic

View: The block to show the expression

Controller: a block handle with commulication within Model and View.

Question A.8 (11 marks)

During the development of a basic user authentication system, you are required to create JUnit test cases to validate the functionality of the UserAuthenticator class. This class includes a method named isValidPassword, which verifies if a provided password satisfies specific criteria.

Write a JUnit test case, named testIsValidPassword, to evaluate the isValidPassword method functionality in the UserAuthenticator class that covers both the test case with valid and invalid password scenarios.

```
class testIsValidPassword{
private UserAuthenticator authenticator = new UserAuthenticator();
@Test
@DisplayName(testIsValidPassword)
public class{
 assertTrue(authenticator.isvalidPassword(password),'The password is right');
 assertFalse(authenticator.isValidPassword(passowrd), "Password needs to change");
  }
}
```

Question A.9 (12 marks)(答案来自最后一周)

Please list and explain the three categories of strategies involved in the Risk Planning phase, and provide related examples to each of them.

Avoid: Like use a high quality code to avoid potential risk

Minim influence: Like use hot-reload to ensure the influence is low

Emergen action: Like make some alternative method to deal with accident

Section B (30 marks)

Question B.1

A banking system provides users with several services:

- To check account balance. User can optionally check recent transactions;
- To pay bills online;
- To manage investment. When managing investment, user can buy and sell his investment.

All services require a secure log-in. The system must be secured, if the system crashes or the network connection fails during a transaction, all the financial data must be left in a consistent state. Draw a use-case diagram for the requirement above.

Question B.2 (15 marks)

Produce a UML state machine diagram for a toy grabber machine with the following behaviors. [Followed by detailed requirements for the toy grabber machine states and transitions]