软件工程导论
期末复习

2023-6

期末考试内容和形式

– 形式：闭卷，英文试题
– 题型：
  • **8道大题:3道简答题（共35），1道非标准答案题（15）,4道分析设计题（共50）**
  • 覆盖：过程模型、分析建模、设计、测试方法

软件工程与软件过程

- 软件危机
- 软件工程：过程，方法与工具
- 软件生命周期
- 软件：特征
- 软件过程框架：沟通、计划、建模、构造、部署
  - 定义软件开发的活动和任务集
  - 辅助活动（**Umbrella activity):**适用于全过程

软件工程与软件过程-续

- 过程模型种类：线性、迭代、演化和并行
- 瀑布模型
- 增量模型
- 原型模型
- 螺旋模型
- **UP**（统一过程模型）：各阶段
- 敏捷方法：敏捷宣言、**Scrum**

需求及建模

- 需求工程
- 需求模型：**4**种模型要素
- 数据**/**信息、功能、行为模型
- 数据模型：实体关系图（**ERD**），数据字典（**DD)**
- 面向对象分析方法**OOA**（用例图、活动图、时序图、状态图、分析类图）
- 结构化分析方法**SA**（数据流图、处理说明、状态图）

系统设计

- 设计概念：模块化、内聚性、耦合性、重构等
- 设计原则 数据设计：三个层次
- 体系结构设计：体系结构风格
- 构件设计：
  - **OCP、LSP、DIP、ISP**等
  - 算法描述方法
- 接口设计：外部接口、内部接口、**UI**
  - 界面设计：三条黄金准则

系统测试

- 测试目标：尽可能多的发现软件缺陷、
- 单元测试
- 集成测试：三种策略
- 确认测试: V&V
- 系统测试
- 测试方法：
  - 白盒方法：基本路径测试方法
  - 黑盒方法：等价类划分、边界值分析

Q & A

Exercise

There is a program to calculate the price of freight.
Given pricing rules of freight (货运定价规则) as following:

The package charges are as follows:If the receiving place is within the province and the weight is less than or equal to 25kg, 8 yuan per kilogram for express mail and 4 yuan per kilogram for slow mail.If the receiving place is in another province and the weight is less than or equal to 25kg, the express mail is 12 yuan per kilogram and the slow mail is 8 yuan per kilogram.If the weight is more than 25kg, the overweight part will be charged 2 yuan per kilogram

(1) Draw a Flow Graph with simple condition for this program.
(2) Compute Cyclomatic complexity of the program.
(3) List a set of independent path for conducting basic path testing.
(4) Design test cases for conducting basic path testing.

Exercise

Please design a GUI for a Logistics System (物流系统) according to the Golden Rules. Following is the description of system.

Kitty is an employee of the logistics company, mainly responsible for receiving and sending parcels. The receiving business needs this information: weight, sender's name and contact information, recipient's name and contact information, and addresses of both parties. Kitty gets the weight of the package by weighing and other information by asking. In addition, customers will be asked to decide whether to send express mail or slow mail. The system will automatically calculate the freight and kitty will ask the customer to pay. After the customer pays, the waybill will be printed for posting on the package.