University of St Andrews
School of Computer Science

CS5030 - Software Engineering Principles

Assignment: **Software Design, Modelling and Analysis**

Deadline: 17 November 2020   *Credits*: 60% of coursework mark

(MMS is the definitive source for deadlines)

Aims

The aims of this assignment are to

- demonstrate your understanding of UML diagrams and their applicability to different artefacts of the software lifecycle
- use appropriate UML diagrams to model the functional requirements, logical software architecture, and structural and behavioural design of a small software system;
- analyse the models produced in the previous step;
- document the outcomes of your work in a precise and logical manner as a technical report.

System description

The target system is a mobile application for an online auction forum. You can think of this application as a simplified version of auction sites such as eBay (https://www.ebay.co.uk). Users of the application include buyers and sellers. Users have to register with the system providing their name, email, address, date of birth and phone number before they can use it for buying or selling. However users can browse items listed with the system without registering. Sellers can log in, post listings of items to be sold, view their listings, change the status of items listed and log out. Buyers can log in, view their purchase history, place bids on listed items, pay for any items they win and log out. Each listing contains the name of the item, description, condition (new / used), photo, starting price, date listed, length of auction (in days), postage cost and status of listing (draft, in progress, ended). Only in-progress listings are displayed to users who browse the system. Once the auction for an item has ended, the winner (if any) is notified by the system. The auction system also interacts with two external systems: a payment system and a postage calculation system.

Requirements

The assignment report should include

1. A specification of functional and non-functional requirements for the system;
2. A UML use case diagram for the system;
3. Use case specifications for 2 of the use cases from the use case diagram;
4. A specification of the logical (application) software architecture of the system using an appropriate UML diagram;

5. Structural design of the significant parts of the system using appropriate UML diagrams;

6. Behaviour design of the system for one particular interaction sequence using an appropriate UML diagram;

7. An analysis of the design you created with respect to given specification and consistency with other artefacts;

8. A brief reflection of the merits and limitations of using UML diagrams to document the design of the system; and

9. References (if applicable).

Notes

- If you find the specification is ambiguous or incomplete in anyway, resolve the issues in a manner consistent with the information provided and list any assumptions you make in the report.

- You can draw UML models using any tool of your choice. You should use standard UML notations.

- Document your decisions and the rationale for making them as you go.

- Any extensions or additions to the specification should be clearly identified in the report. I would strongly advise completing the basic requirements before extensions are attempted.

- If you have difficulty showing any of the UML models in a legible manner in the report, you may include them separately *in pdf format* as part of your submission in addition to including them in the report.

Submission

A report in pdf format must be submitted electronically via MMS by the deadline. Report submissions in any other format will be rejected.

Assessment

Marking will follow the guidelines given in the school student handbook (see link in next section).

Some specific descriptors for this assignment are:

Mark range	Descriptor
1 - 6	Minimal attempt to complete assignment and/or poor documentation of work.
7 - 10	Reasonable attempt at the assignment with use case, structural and behavioural modelling and some understanding of UML diagrams but with substantial problems relating to relevance or correctness.

11 - 13	Competent attempt at the assignment covering most required aspects including the above types of modelling, with a clear understanding of the use of UML, analysis and supporting conclusions.
14 - 16	Good attempt at the assignment addressing all required aspects including requirements extraction and UML modelling without major problems, documented in a well-written report showing good understanding of UML and critical thinking.
17 - 20	Well-written report outlining excellent work addressing all required aspects without any defects, possibly including more complex modelling and critical analysis of the work.

Policies and Guidelines

Marking
See the standard mark descriptors in the School Student Handbook:
http://info.cs.st-andrews.ac.uk/student-handbook/learning-teaching/feedback.html#Mark_Descriptors

Lateness penalty
The standard penalty for late submission applies (Scheme B: 1 mark per 8 hour period, or part thereof):
http://info.cs.st-andrews.ac.uk/student-handbook/learning-teaching/assessment.html#lateness-penalties

Good academic practice
The University policy on Good Academic Practice applies:
https://www.st-andrews.ac.uk/students/rules/academicpractice/