



CS5030 - Software Engineering Principles

Assignment: Software Design, Modelling and Analysis

Deadline: 16 November 2021

Credits: 60% of coursework mark

(MMS is the definitive source for deadlines)

Aims

The aims of this assignment are to

- demonstrate your understanding of software design, UML diagrams and the applicability of these diagrams 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

You are required to design an application to support feedback, response and actions between students and schools at the University of St Andrews. Each school will appoint a member of administrative staff, who does not teach, supervise or advise students, to manage the system. All students and staff of the school are registered as users of the system and therefore, the application must interact with systems used by the University's Human Resources unit (for staff details) and Registry (for student details). In addition, the application should have information regarding role holders among staff and students, such as lecturers of modules, level coordinators, student representatives for different levels and technicians. The data contained in the application should be updated on a regular basis and reset each academic year.

Feedback can be provided by students or staff. Feedback is not anonymous at the point of submission but it will be anonymised, unless requested otherwise, before it is passed on by the administrator to relevant stakeholders for response and action. Student representatives can submit feedback on behalf of other students. Feedback could relate to a specific module, a level of study (for example, Junior Honours or PGT) or a wider concern (for example, lab provision or school environment). A response from the role holder who receives feedback is expected within the specified time frame. Feedback from staff for students is passed on to the relevant level representatives to be disseminated to students. Actions can be associated with each feedback, to be completed within a set time and an update on actions taken is provided to the person, who provided the feedback. The application should enable anonymised summary reports to be generated for school management as well as 'you said, we did' reports for students. The system should be



configurable, for example, to enable reminder notifications of upcoming response deadlines, set default response time frames and specify the period covered by reports.

The system will be initially trialled in 2 schools at the University. It will be refined based on feedback from this use and deployed to all the schools. There is also a plan to release the software for use by other universities in the future.

Requirements

The report should include

1. A specification of functional and non-functional requirements for the system;
2. A brief discussion of any ethical considerations for the system;
3. A UML use case diagram for the system;
4. A use case specification for 1 use case from the use case diagram;
5. A specification of the logical (application) software architecture of the system using an appropriate UML diagram;
6. Structural design of significant parts of the system using appropriate UML diagrams;
7. Behaviour design of the system for one particular interaction sequence using an appropriate UML diagram;
8. An analysis of the design you created with respect to given specification and consistency with other artefacts;
9. A brief reflection of the merits and limitations of using UML diagrams to document the design of this system; and
10. References (if applicable).

Notes

- If you find the specification 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/>