Software Development

Assessed Coursework

Summary

Software Development encompasses more than just coding, it involves, to name a few elements, gathering requirements, design, analysis, planning, identifying risks and communication. The assessment for Software Development is in the form of a small software product development project. This project encompasses planning, requirements, design and prototyping. When undertaking this project, you should follow good development practices. You will be expected to justify and explain the decisions you make as part of the assessment. The goal is to create a design and, from this, a prototype. It is important to realise that the aim is not to create a fully functional complete product, but to create a prototype which can be assessed for future development.

The product concept description is in the appendix of this assessment.

Teams

This assessment is completed as a team assignment. By default, a team will have 4 members as far as possible given enrolment in the course. You should ensure that the overall amount of work each member of your team does is equally divided.

If problems occur in a team that are not work-based, the team should initially attempt to mediate amongst themselves. Should this prove to be insufficient, issues should be directed to the course organiser. Likewise, any conflicts that cannot be resolved within the team will be mediated by the course organiser, on request.

Marking for each submission is detailed in the submission guidelines.

Each team member will be required to submit an evaluation of the team performance – rating themselves and other team members.

Submissions

The assessment is split into three criteria groups.

There will be two milestone snapshots and one final submission. The milestones will be snapshots of your project. **You will not have to submit anything on these milestones.** These will be taken from your group repositories by the course team.

The final submission **must be submitted by each member** of the group to the Assignment Submission tool (Turnitin).

There will be three peer assessment contributions, one per month approximately for the groups to submit.

Each element will be marked out of 100 and weighted according to the assessment specification.

After each milestone, an indicative grade and feedback will be provided. The final submission will have individual marks (weighted by peer assessment) assigned and feedback provided.

All marks are subject to moderation by the MSc course board.

This assignment will not feature anonymous marking due to being a group exercise.

Criteria Groups

Criteria Group	Weighting
1 – Design	40
3 – Planning	20
5 - Implementation	40
Total	**100**

Peer Assessment

Part of working in a team is the ability to provide feedback for each member of the team.

Each month, a peer assessment of all members of a group **must be submitted** by each individual in the group.

The monthly peer assessments will be used to modify the group mark for each individual for the final group assessment mark.

This peer assessment will involve rating each member of the group on four key questions. Importantly, you must rate yourself in this peer assessment.

The questions will all ask you to give a person a rating from 0 (zero) to 5 (five).

Important – please read the following:

A rating of 3 (three) is considered satisfactory. 3 (three) is the default rating for someone who carries out their tasks and cooperates within the bounds of expected behaviour.

Ratings above 3 indicate a team member contributed significantly more/significantly higher quality work/acted in a significantly more professional or collaborative way.

Ratings below 3 indicate a team member contributed significantly less/significantly lower quality work/acted in a significantly less professional or collaborative way.

Ratings of 1 or 0 will not be taken at face value unless problems within the group were raised with the course team at least 5 days before submission and can be demonstrated with evidence.

The peer assessment will influence the group mark for each individual.

Unsubstantiated ratings or coordinated efforts to negatively affect or manipulate this process will be treated as academic misconduct.

Assessment Regulations

https://www.ed.ac.uk/academic-services/policies-regulations/regulations/assessment

Criteria Group: Design

The design criteria group should demonstrate the ability to investigate the problem and create a set of requirements or equivalent information for designing a solution.

The final submission should include elements which cover:

- High-level design of an end-to-end solution
- Detailed design of the component(s) prioritised for a prototype
- Linking design to requirements
- Requirements including methodology choice, priorisation and sourcing
- Language and Technology Choices – including alternatives considered
- Data Model for the designs
- Test Plan for Components

Marking

Requirements Engineering	30%
Language and Technology Choices	20%
Design, and Data Modelling	30%
Test Plans	20%

Criteria Group: Planning

The planning criteria group should demonstrate the ability to carry out the planning and management aspects of a software development project.

The final submission should include elements which cover:

- A risk register and description of a risk management approach.
- Usability Cohort Design and Test Plan
- Project Management Approach
- Project Management Evidence
- Timeline including effort estimates and summaries

Marking

Risk Review	25%
Usability Cohort and Test Plan	25%
Project Management	25%
Task Management and Timeline	25%

Criteria Group: Implementation

The implementation criteria group should demonstrate the ability to produce, evaluate and document the outcomes of a software development project.

The final submission should include elements which cover:

- Working prototype:
  - setup scripts
  - documentation
  - code base
- Deployment of a CI/CD pipeline
- Usability Testing Summary and Analysis
- Software Testing Results and Analysis
- Project and prototype evaluation
- Coherent Documentation and Repository Use

While there is no enforced language or technology, the prototype should be submitted as a code base with setup scripts so that a tester can deploy the code, run a set of user tests and evaluate the product. The documentation should support the user through the first few actions after installation.

The usability testing could be done via pen/paper or mock-up interfaces or via an implementation. This should include how the test cohort was created, how it deviates from an ideal cohort and what the results of the testing mean.

The testing should examine elements of the prototype for how well it performs given different conditions and report back on this with limitations of the code base and suggestions of improvement.

The project and prototype evaluation should summarise and critique the whole group process (e.g., did you meet your plan, did you deviate, why?). This should include how the requirements were met, what effort was expended and how the team and prototype performed and what lessons can be learned.

Marking

Final Prototype (code, setup scripts, documentation)	30%
CI/CD Pipeline Design and Deployment	10%
Usability Analysis	15%
Testing Analysis	15%
Project and Prototype Evaluation	25%
Quality of Presentation	5%

Notes

Quality of Presentation

The quality of presentation mark is intended to assess the coherency and readability of the presented work. This includes but is not limited to the structure of any submission, the quality of diagrams and charts, observance of good spelling and grammar, and the general readability of the work.

Decisions

The assessment has many possible routes to completion - one of the main goals of the assessment is for you to show your reasoning and justification for your decisions. The assessment should show where you have considered alternatives and why you chose the options you have selected.

Assessment Format and Source Code Submission

This project will be run using the Gitlab project functionality. This will allow the students to use a provided Git repository, Wiki and issue tracking system to complete their assignment. Groups will be assigned a virtual machine on the EIDF DSC for prototyping and development purposes. No external services or content holders will be assessed without prior agreement from the course organisation team.

At each deadline, a copy of the Wiki and Repository will be taken via snapshot. The live repository will be marked up to that point.

Submission Format for final submission:

---START FILE---
Software Development Assignment: ASSIGNMENT_NUMBER
Submission Owner: YOUR_NAME : YOUR_STUDENT_NUMBER
Group Members:
 - GROUP_MEMBER : NUMBER
 - GROUP_MEMBER : NUMBER
 - GROUP_MEMBER : NUMBER
Gitlab Project Link: GITLAB_PROJECT_LINK
Commit_ID: GITLAB_COMMIT_ID
Virtual Machine: VM_NAME : VM_IP
---END FILE---

Appendix - Product Description

Sports Analysis, Insights and Recommendation System

Sports are a massive industry, they provide employment to people beyond just players of sports, they provide enjoyment and entertainment to a wide range of people. Sports can be enjoyed at just about any level from casual up to professional level. At a professional or even high amateur level, the smallest improvement to an aspect of a team or individual performance can make success in the sport more likely. No sport is deterministic, the game has to be played to find out the outcome, upsets do happen and that is part of the appeal of sports. No matter how good you are, someone can always beat you.

The benefits to teams can be important, they can look at many factors to help build their teams, a well-known example of this is sabermetrics used in baseball, other examples include game and movement tracking down to the individual player for every game. This can look at how many minutes a player is moving for, number of turns, average speed, number of jumps, shooting accuracy, defending motions. The number of things which can be looked at is immense and can change for every sport.

This can be important for individual players who can have their movements and techniques analysed, potentially reducing the chance of injury, and extending careers. This can help with planning physiotherapy and training sessions to best suit the player and integrate with a wider team.

The client would like to develop a product which can interface with recording devices to record data about movements and stresses on teams and individuals, ingest statistics about games and players, look at potential improvements in performance and technique and produce recommendations for injury prevention, resting and training.

The product should be able to allow multiple individuals and/or teams to be recorded and analysed in the system. The system should be able to reference physiotherapy, medical and sport science information in order to support any recommendations. All outputs should be recommendations or analytical reports for human consumption as all decisions should have human input in this case.