

ISAD157

Analysis and Design Project

**20 CREDIT MODULE / 70% COURSEWORK SUBMISSION
/ 30% PRACTICE SUBMISSION**

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MODULE TUTOR: Shirley Atkinson

MODULE AIMS

This module provides students with the opportunity to learn and apply fundamental analysis and design concepts to the context of a computing project. Skills are developed in creating a common understanding of the needs, priorities and constraints relevant to a software system. Requirements and data are modelled, described and empirically evaluated through implementation.

ASSESSED LEARNING OUTCOMES (ALO):

1. Identify both functional and non-functional requirements for a given specification of a software system.
2. Identify and model data within a software system using relevant diagrams.
3. Implement requirements using a declarative query language to extract data from a system.
4. Evaluate a given specification for a software system.

OVERVIEW

ISAD157 – Analysis and Design Project is a second semester module that provides you with the grounding knowledge around requirements modelling, analysis and design. This is where you develop your knowledge and skills around the planning of complex computing/software projects irrespective of the type being created.

This document provides you with the important details for your assessment. There is just one document to cover both elements of the assessment, the coursework and the practice element, the details of which are provided below.

Module Deadlines & Deliverables

To pass this module you must achieve an overall grade of 40% across two elements of assessment. The coursework element is worth 70% and the practice element is worth 30%. The details for these elements of assessment are provided below. If you fail one element of the module AND obtain less than 40% for the overall mark, you will have to take a referral for (or repeat) the whole module.

Important Dates and Deliverables:

Element	Description	Deadline/Date	Percentage
	Feedback sessions These weeks are for practice presentations and feedback.	Weeks 39 and 40 As per timetabled sessions	N/A
C1/W1 1	Final Individual Requirements Analysis Report. DLE Submission Details provided below	Week 40 Thursday 30/04/20 16.00hrs	70%
P1/W1 1	Presentation Provide a 5 minute presentation with 5 minutes for questions regarding your submission.	Weeks 41 and 42 Student to select scheduled slot during timetabled sessions	30%

COURSEWORK 01 (C1W1) – Requirements Report 70%

DESCRIPTION

Your task is to analyse the scenario below and to create the appropriate requirements models to represent both functional and non-functional requirements. Based on your models you are to create code to implement a sample of your requirements (not all) and carry out an evaluation of the suitability of your models.

The sample you create must include your database tables and SQL code to extract data from those tables along with a sample web-based or desktop interface. The evaluation of your requirements models must be written up following your implementation.

Your submission is a PDF report where you write up your evaluation of your requirements analysis, present your models and outputs from the task described above. Further details are provided in the section below.

PRESENTATION 01 (P1W1) – PRESENTATION VIVA 30%

You will have 5 minutes to outline to the two staff members your overall requirements model and show the implementation. You must discuss the models that you created and how you evaluated them. You will then have 5 minutes for questions. Further details are provided below.

SCENARIO

For this assignment you will focus on the analysis and design of a data driven application that will store Facebook users, their corresponding friends and messages exchanged among them. You must use a relational database (MySQL) as the mechanism to store your data and you must use C# as your code mechanism to illustrate a sample interface for your model. No other choices for the database or programming language is allowable.

A Facebook user can have many friends on the social network. Such friends are also Facebook users who have their own friends. Facebook users can exchange messages with other users and have a number of attributes that are indicated in Table 1. Table 1 must form the basis of your logical data model.

Facebook User Profile																									
User ID:	1245																								
First Name:	Kate																								
Last Name:	Lawson																								
Hometown:	Norwich, Norfolk																								
Gender:	Female ✓	Male	Unspecified																						
Relationship status:	Single	Engaged ✓	Married	It's Complicated																					
Current Town or City:	Plymouth, UK																								
Workplace:	University of Plymouth	4 Sep 2017 – Present																							
	Plymouth High School for Girls	1 Sep 2016 – 31 Aug 2017																							
	City of Norwich School	1 Sep 2015 – 30 Jun 2017																							
School or University:	University of East Anglia	1 Oct 2012 – 30 Sep 2015																							
	Notre Dame High School, Norwich	1 Sep 2008 – 30 Jun 2011																							
Friends																									
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Table 1. Attributes derived from a generic Facebook profile

COURSEWORK 01 (C1W1) – DELIVERABLES IN DETAIL

The **individual** requirements analysis report accounts for 70% of the module mark. This is entirely your work.

You must submit **one PDF** file via the link on the ISAD157 DLE.

Documents must be uploaded by the deadlines shown on the DLE. Ensure you do not leave uploading to the last minute or you may face a penalty if the server upload speed is too slow. Double check the submitted file was correctly uploaded. A second late will see your mark capped at 40%. It is recommended that you upload the day before, earlier if possible.

In addition to being structured appropriately with an introduction, the evaluation and a conclusion, your report must also contain the following:

- UML Diagrams to represent the whole model
 - Use Case Diagram
 - Class Diagram
 - Activity Diagram
 - Sequence Diagram
 - State Diagram
- Entity Relationship Diagrams
 - Initial
 - The results of normalization
 - Final
- SQL Query statements required to create the tables in your database and their corresponding primary and foreign keys. The statements must be in plain text format and not in the format used by MySQL Workbench. Screenshots taken from the MySQL Workbench or any other editor or software package, or queries submitted in the wrong format will not be marked and a zero will be awarded for this element.
- Link to Git account containing your code with a Readme file that describes the nature of the repository. Do not leave the readme file without content.
 - Both members of staff for the module must be added as collaborators.

REPORT

Your report must be presented as a PDF document and the overall length of the report (excluding references and appendices) must not exceed 2,000 words (+/- 10% as per University regulations). Your report must contain an appropriate introduction and conclusion section in addition to the evaluation of your requirements models and implementation.

Although you are expected to make significant use of printed and online literature in researching and producing your materials, it is not acceptable for you to simply copy and paste material from other sources (small quotes are acceptable, but they must be clearly indicated as being quotes and the source must be referenced appropriately). You are reminded that the University has a Plagiarism policy and you must abide by it.

There is help for writing professional reports given at the WRASSE site <https://wrasse.plymouth.ac.uk/> in addition to a large number of resources in the library.

ENTITY RELATIONSHIP DIAGRAM (ERD)

You must create an initial Entity Relationship Diagram (ERD) for your proposed Facebook database, using Table 1 as your starting point. This initial ERD should only include entities and relationships that can be justified from reasonable assumptions. Make sure that all one-to-one and many-to-many relationships are resolved prior to the submission. You must state your assumptions.

You must create the Final ERD where you name the 3NF relations and draw the ERD using the taught notation of soft boxes and crows feet. Ensure that the ERD offers an accurate representation of the database. Inconsistencies between the ERD and the actual database will be penalised.

NORMALISATION

Produce the Third Normal Form (3NF) from the sample shown in Table 1. Normalise the attributes in Table 1 to Third Normal Form (3NF) showing all intermediate stages, namely: Un-normalised Form (UNF), First Normal Form (1NF) and Second Normal Form (2NF). Be careful to highlight the attributes used for keys. You are welcome to declare additional attributes which you may consider indispensable, but you will have to justify the presence of additional attributes in your solution.

Optimisations to the results of 3NF are welcome, but not essential. Additional marks will NOT be granted for optimising the results of 3NF, thus optimising may not be worth your effort.

DIAGRAMS

It is recommended that you use draw.io as a tool and embed your diagrams into your report. Do not draw diagrams manually and scan them in.

DATABASE

Use the actual and anonymised Facebook data provided as test data. You must import all the data provided into the database that you submit. Be aware that some data is missing and you will have to create it in order to populate your database. The database must be hosted on the server provided by the module.

SAMPLE CODE

Your sample code must be clearly in your git repository

The readme file for your repository must be appropriately completed.

No previous versions of the code should be present in a .zip or other compressed format.

Good coding standards are expected which include:

- Logical naming conventions for variables, methods and classes.
- Commenting where appropriate.

NB: If we cannot access your material from the date of submission we may not be able to mark it!

Anonymous marking cannot be used for this assignment due to the peer review activities needing to be traceable

PRESENTATION 01 (P1W1) DELIVERABLES

You must be available to attend a presentation viva during the last two weeks of teaching as shown in the important dates section above. You will be allocated a time slot following the submission of the report. These will be during the course of your normal practical sessions and every attempt will be made to keep to your normal day of attending, **however this cannot be guaranteed**.

The presentation must not differ from the report you have submitted during the previous week.

You have 5 minutes to give an overview of your requirements modelling activities and 5 minutes to answer questions. You may use Powerpoint for a presentation if you feel this will help you, but it is just as acceptable to use your submitted report as a prompt. You will be expected to have good knowledge of what you have written and which items you have on which pages.

Given the time period is very tight, you are expected to be ready at the minute your time starts. Any late arrivals will have the time deducted from their 10 minutes slot and is highly likely to have a detrimental impact on your final grade. Students will therefore be expected to arrive at the start of the practical time and to set up ready. Do not wait until your presentation time to enter the room.

It is also strongly recommended that you plan what you will say in your 5 minutes and practice it.

Useful Links

The University provides support for student wellbeing via <https://www.plymouth.ac.uk/about-us/teaching-and-learning/guidance-and-resources/student-support-services>. Please pay particular attention to the following two sections:

- Referencing and also Plagiarism policy. <https://www.plymouth.ac.uk/student-life/your-studies/essential-information/regulations/referencing>
- Extenuating circumstances. <https://www.plymouth.ac.uk/student-life/your-studies/essential-information/exams/exam-rules-and-regulations/extenuating-circumstances>

Please refer to all the lecture content & further study resources on the [DLE](#).

Marking Rubric : Coursework

LO	Description	Total Mark (%)
1	<ul style="list-style-type: none">• Requirements have been appropriately identified.• Assumptions are clearly given.• Expected UML diagrams are present in the report• UML diagrams are used appropriately	30
2	<ul style="list-style-type: none">• ERD is appropriate• Normalisation is appropriate• Models match implementation	20
3	<ul style="list-style-type: none">• SQL statements are appropriate• SQL runs and provides output as expected• All expected elements are provided within the SQL statements• Format is as instructed• Tables are present on hosted MySQL server	30
4	<ul style="list-style-type: none">• Evaluation is appropriate and has been carried out to an appropriate depth• Writing is of appropriate quality.• Report has been structured correctly	20

Marking Rubric : Presentation

LO	Description	Total Mark (%)
1	<ul style="list-style-type: none">• Presentation clearly identifies key requirements	30
2	<ul style="list-style-type: none">• Presentation clearly identifies ERD and normalisation approach	20
3	<ul style="list-style-type: none">• Presentation clearly identifies the SQL and implementation	30
4	<ul style="list-style-type: none">• Presentation discusses evaluation appropriately.	20

Boundary	Diagrams	Implementation	SQL	Presentation
Fail Does not meet learning outcomes.	Diagrams have major elements missing or substantial errors.	Code does not work and would never have worked.	SQL statements are not correct. SQL statements do not run when imported into MySQL database. Fatal flaws observed in structure	Student does not attend presentation or rambles and is not coherent
3 rd (40-49) Ok – but only just	Diagrams are readable but only by an expert. All diagrams expected are present. Report is not well organised – and there are a few minor errors Evaluation weak.	SQL shows a very basic application, has very little depth.	SQL statements run and create tables in MySQL database. Structure of SQL statements indicate some flaws.	Student presentation weak but attempted, only shows a partial understanding of what has been created. Student waffles and is not really coherent. Basic elements for marking rubric provided.
2:2 (50-59) Some good elements but doesn't do all it should.	Majority of diagrams conform to modelling conventions. Models are as expected. All elements present. Evaluation ok.	There is evidence of understanding of the code. SQL and code match the models.	SQL statements run appropriately. Expected aspects are contained within the SQL.	Student has some good elements to the presentation but there are some weak areas demonstrated. Good attempt at presentation but evidence of lack of practice. Elements for marking rubric provided and not basic.
2:1 (60-69) Does all it should, is good, but plays safe	Models easy to understand and read. Format of models appropriate. Report layout logical and well structured. Evidence of evaluation clearly shown.	Code and SQL covers the requirements as expected. Code and SQL of good quality. Student understands code and how they put it together.	SQL well written. Expected aspects are contained within the SQL and meet the requirements fully.	Student has planned well, sticks to time and answers questions effectively. Clear evidence of planning and clear structure to presentation Good evidence for elements for marking rubric provided.

<p>1st (70+)</p> <p>Shows self-discipline self-led learning and wide reading. Is excellent.</p>	<p>Models well organized and report easy to follow. Adheres to good practice expectations.</p> <p>Excellent modelling structures in place, clear evidence of quality approaches and robust evaluation</p> <p>Requirements design shows student has carried out substantial self-led learning.</p> <p>Requirements modelling goes beyond what has been taught in module</p>	<p>All requirements illustrated in concise fashion but with enough code to demonstrate how models applied.</p> <p>The SQL and interfaces are of a very high standard</p> <p>The quality of the work is outstanding with no significant flaws. It demonstrates a good level of competence and depth</p>	<p>SQL excellent and adheres to best practice.</p> <p>Substantial self-led learning demonstrated.</p> <p>No significant flaws and demonstrates very high level of competence and depth.</p>	<p>Student provides excellent presentation, is timely and articulates their model well.</p> <p>Very clear evidence of self-led learning and excellent knowledge of the topic area.</p> <p>Questions answered exceptionally well.</p> <p>Excellent elements for marking rubric provided.</p>
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