University of Westminster

Department of Computer Science

6COSC001W Enterprise Application Development – CWK 1 (2020/21)

Module leader	Milos Kojic
Unit	Coursework 1 – Design and evaluation.
Weighting:	50%
Qualifying mark	30%
Description	Use of UML for the analysis and design of a domain problem. A report on the design decisions and the suitability of the design for implementation.
Learning Outcomes Covered in this Assignment:	This assignment contributes towards the following Learning Outcomes (LOs): - LO1 Identify and use appropriate software engineering principles to successfully design and develop a software project; - LO4 Assess how software quality issues impact on software design; - LO7 Autonomously manage a small project with respect to time and task management and be able to critically evaluate personal performance;
Handed Out:	12th October 2020
Due Date	2nd November 2020. Submission by 1:00pm
Expected deliverables	PDF report uploaded to Turnitin as pdf file.
Method of Submission:	Electronic submission on BB via a provided turnitin link close to the submission time. The file you upload should have the following naming format: <Cw1_StudentNumber_FullName.pdf> E.g. Cw1_w123456_JohnSmith.pdf
Type of Feedback and Due Date:	Feedback and marks 15 working days (3 weeks) after the submission deadline. All marks will remain provisional until formally agreed by an Assessment Board.

Assessment regulations

Refer to section 4 of the "How you study" guide for undergraduate students for a clarification of how you are assessed, penalties and late submissions, what constitutes plagiarism etc.

Penalty for Late Submission

If you submit your coursework late but within 24 hours or one working day of the specified deadline, 10 marks will be deducted from the final mark, as a penalty for late submission, except for work which obtains a mark in the range 40 – 49%, in which case the mark will be capped at the pass mark (40%). If you submit your

coursework more than 24 hours or more than one working day after the specified deadline you will be given a mark of zero for the work in question unless a claim of Mitigating Circumstances has been submitted and accepted as valid.

It is recognised that on occasion, illness or a personal crisis can mean that you fail to submit a piece of work on time. In such cases you must inform the Campus Office in writing on a mitigating circumstances form, giving the reason for your late or non-submission. You must provide relevant documentary evidence with the form. This information will be reported to the relevant Assessment Board that will decide whether the mark of zero shall stand. For more detailed information regarding University Assessment Regulations, please refer to the following website:**https://www.westminster.ac.uk/current-students/guides-andpolicies/academic-matters/academic-regulations**

Coursework Description

Problem Statement

Design software for a project management system. In this application you should be able to create companies, projects, users, and tickets. Assign projects to companies, users to projects and tickets to users. Allow users to be able to change the state of the ticket. Build a board that shows up tickets. Produce reports that show productivity of users and development progress. Predict the number of projects that each company will have, and the number of people needed to build these projects for any future date, based on historic data. Think of Jira or Trello.

Your task is to develop a design document for this application. You are also to produce a report describing the reasons for your design decisions and how suitable you deem your design is for implementation. You will then use this design to implement your application for CW2.

Higher marks will be awarded if you make use of and discuss the advantages and disadvantages of a design pattern such as MVC, MVVM, component architecture, etc.

The design document will consist of these sections:

Part A – Requirements

List the main functions that you will build into your product. Use Appendix A to get started. You should also produce designs for your forms.

Your objective is to list the functionality of your application. The requirements should answer the questions:

What does your product do? What activities can users perform while using it?

State the software/system requirements for the system using this style:

R1 The software shall allow the user to enter expenses for a certain date.
R1.1 The software must allow for the setting up of contacts.
R1.2 The software will provide a form for the entry of expenses.
R1.2.3 An option will be given to enter recurring or one off expenses.
R1.3 …
…

R2 Allow the user to produce a report.

R3 Allow the user to produce a prediction for a certain date .

Description: For each you may put a sentence or paragraph further describing the requirement. ... **and so forth.**

Record as many as you can. These are requirements so do not discuss how it shall be done just **what** needs to be done.

Additionally, you will need to list non-functional requirements:

NF1. The application must run on windows.

NF2 The application must be implemented using c# and WPF.

…

Marks Available 10%.

Part B – Use Case Diagrams

1) Based on your requirements document, draw one or more use case diagrams for the system. Note: The use of correct UML is important here. ***Marks Available 5%.***

2) For each use case – create a use case description for the main flow (see Appendix B **for the template on which to base these)** ***Marks Available 10%.***

Part C – Classes

1) In consideration of your use case descriptions, discover as many classes as possible and record these in a CRC (Classes, Responsibilities, and Collaborations) table. (See **Appendix C** for a template) ***Marks Available 10%.***

2) Draw a domain model for the system (**see lecture notes for an example**). You do not need to put in any attributes or methods but you must label all associations and use correct UML when describing generalisations and aggregations etc. ***Marks Available 15%.***

Part D – Collaboration

For each Use Case draw an analysis sequence diagram (see Appendix D for example). ***Marks Available 15%.***

Part E – Activity

Derive an algorithm for the prediction of the number of projects and the number of people needed at a given date based on historic data. Draw a *detailed* activity diagram to describe the calculation. This should be detailed enough for you to produce a coded algorithm for your CW2. ***Marks Available 15%.***

It is important that you be as concise as possible with your design, you will be required to implement and deploy your design for the second coursework.

Part F – Self assessment form and Report

1. Completion of the self assessment form. Marks will be awarded on how well you describe what has been achieved for each section. 5%

2. A 500 to 1000 word evaluation of the suitability of your design for implementation. What are the strengths and what is lacking. Think about how you would react if you were a manger and someone gave you this design. 15%

Marks Available 20%.

Coursework Marking scheme

The Coursework will be marked based on the following marking criteria:

Criteria	Mark per component	Mark provided	Comments
PART A Requirements	**10**		
PART B Use cases			
- Diagram	5		
- Descriptions	10		
PART C Classes			
- CRC	10		
- Domain model	15		
PART D Collaboration	15		
PART E Activity	**15**		
PART F Evaluation			
- Self assessment form	5		
- Suitability for implementation	15		
Total	**100**		

APPENDICES

Appendix A

This tool will allow an individual user to see the status and description of each task for the projects the user is working on.

User Interface

This will be built as a .NET C# application. You are free to design the user interface as you wish but here are the minimal requirements. The interface **must at least have these views**:

1) CRUD (Create, read, update and delete) + list, for at least three entities
2) A report page – showing all projects and tickets completed for a chosen date range.
3) A page that enables the user to see their predictions at a certain date.

It is up to you how you design your pages. We are purposely not giving you a design example to avoid everyone having the same design. You are advised to create mockups and storyboards and modify them iteratively as you develop your design document.

Your design decisions should be included in your report.

Storage of run time data

You need to have at least one view that should be a **programmatic dynamic interface**, meaning that the UI is dynamically generated based on the options that the user selects on the UI. Once the user has finished you need to save all the data in some persistent form: database, JSON, etc. When the application is run again (after closing) the system shall use the data to populate the displays to appear as you left it before. When writing to or reading the data, the activity should be threaded (to enable the interface to be usable while writing to an external store).

Appendix B

Use Case Scenario Template
(Use sections that are appropriate for your design)

Use Case: **<Enter Use Case name here>**
<Enter a short name for the Use Case using an active verb phrase.
e.g. Withdraw Cash, Register Customer, Rent Video, Calculate Sales Tax, etc.>

Id: UC-- <Enter value of Id here>
Note: Enter a unique numeric identifier for the Use Case. e.g. UC-001>

Description
<Enter description here>

Note: Briefly describe this use case. e.g.
Enter a name and description for a task.

Primary Actor
<List the Primary actor here>

<List the Actor who's goal is being satisfied by this Use Case and has the primary interest in the outcome of this Use Case. e.g. Student>

Supporting Actors (if any)

<List supporting actors here>

<List the Actors who have a supporting role in helping the Primary Actor achieve his or her goal.
e.g. Customer, Store >

Stakeholders and Interests (if any)

<List Stakeholders and their interests here>

<List the various entities who may not directly interact with the system but they may have an interest in the outcome of the use case. Identifying stakeholders and interests often helps in discovering hidden requirements that are not readily apparent or mentioned directly by the users during discussions.

Pre--Conditions

<List Pre--Conditions here>

<List the system state/conditions that must be true before this Use Case can be executed. e.g. User must have at least one project entry.>

Post Conditions

Success end condition

<List success end condition here>

Note: Enter the successful end condition of the Use Case where the Primary Actor's goal is satisfied.
e.g. The number of tasks is updated.

Trigger

Note: The event that starts this Use Case Example: the user wishes to enter date for the prediction.

<List Use Case trigger here>

Main Success Scenario

Note: Enter the Main flow of events. i.e. The steps narrating/illustrating the interaction between Actors and the System. Describe Actor's actions/stimuli and how the system responds to those stimuli. Describe the 'happy path/day' scenario, meaning the straight and simple path where everything goes 'right' and enables the primary actor to accomplish his or her goal. Main flow/path should always end with a success end condition.

1. User selects an option to create a new task.
2. User enters details for the task. System checks if the input is valid.
3. User enters number of entries.
4. User enters details for each entry.
5. System creates new tasks.
6. System displays updated list of tasks

Variations

<Enter variations here>

A variation would be if the user has the option to enter tasks one at a time with an 'Add' button for example.

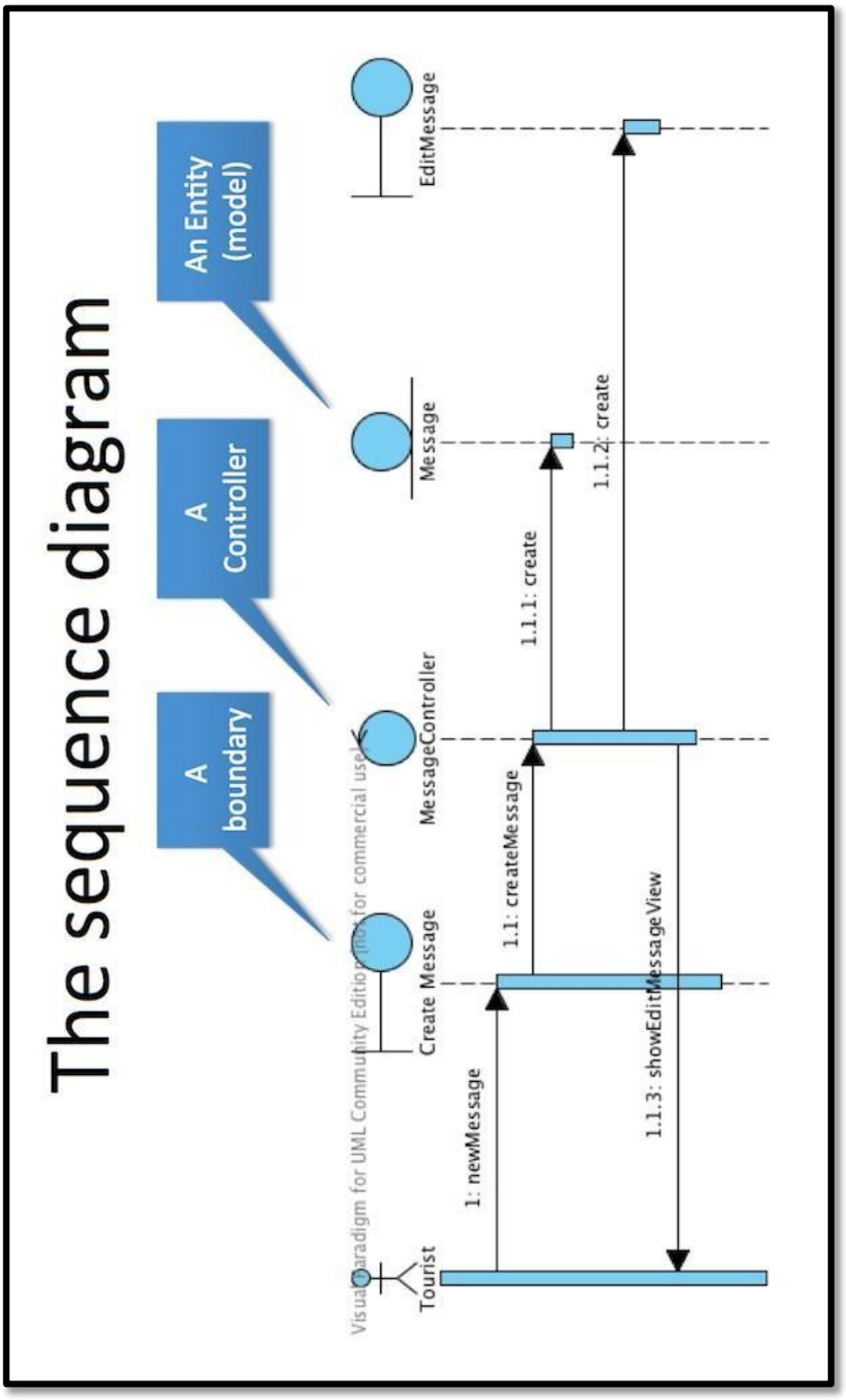
Appendix C

Please note, you do not have to use MVC, you can use any design pattern you think is suitable for your design.

Class Name	**Type**	**Responsibility**	**Collaborations**
Payment	Model	Holds details of payments such as name, address, …	Expense
IncomeDetailsView	View (Form)	View for creating or updating income details	IncomeDetailsViewController

This a minimal example CRC. Should be detailed and unambiguous.

Appendix D


The sequence diagram
A boundary
A Controller
An Entity (model)
Tourist
Create Message
MessageController
Message
EditMessage
1: newMessage
1.1: createMessage
1.1.1: create
1.1.2: create
1.1.3: showEditMessageView
Visual Paradigm for UML Community Edition [not for commercial use]