

**Bachelor of Science in Computing**

**Software Engineering**

**Year 2022-23 / Semester 2**

Internal Examiner: Wei Ren

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External Examiner: Maria Barry

Date: 24/04/2023

Duration: 2 Hours

Time: 10:00-12:00

Exam Weighting: 60%

Exam Delivery: Computer

**Instructions**

1. This paper contains 1 section with 1 question.
2. You must attempt all parts of the question.
3. All questions are marked out of 100.
4. Please write all answers on the script provided.
5. Clearly number all questions.
6. This is an open-book exam.

***Please do not turn over this page until instructed to do so****. The use of programmable or text storing calculators is expressly forbidden. Please note that where a candidate answers more than the required number of questions, the examiner will mark all questions attempted and then select the highest scoring ones.*

**Question 1**

Please answer the question based on the following scenario: You are managing a software development team that has been invited by “Dorset Bank” to develop an operating system for their ATM machines. The ATM machines should allow clients to withdraw money at any time and deposit cash or checks. Additionally, the machines should display the client's account balance. You have 4 weeks to do this project.

1. Select a development method for this project and provide the reason for your choice, (e.g. waterfall development method, agile development method, etc.).

I will select Agile methodology.

I would select this method because is an interactive and flexible method and it allows the team to be able to make changes quickly if the user wants to change something. This method is good for a team to work together and collaborate with each other to get the better result.

In case the user wants to do any change while the system is developing, this method allows to make changes and be able to redirect the development team to the new way.

**[14 marks]**

1. Provide a comprehensive list of the steps involved in the software development process.

There are different steps to follow in the software development process, such us:

1. Know the requirements that the user wants for the operating system and the different functionalities that they want on it.
2. Create the design and the different database schedules for the operative system.
3. Start implementing the different parts of the system in code, writing with the better coding language for it.
4. Do test to make sure that all in the project works as it should do it and check if the different requirements that the user wants are done.
5. Deploy the system to make sure all goes well and make it accessible to the user that are going to use this system.
6. Offer support to the operative system and make updates of it to make sure all continues well and solve any problem that can appear.

**[5 marks]**

1. Write a requirement document based on the client's previous requirements, including functional requirements, interface requirements infrastructure requirements.

Functional requirements:

* The user should be able to withdraw money at any time from the ATM machine.
* The user should be able to deposit cash or checks in the ATM machine to top-up the bank account.
* The user should be able to see the account balance of their bank account from the ATM machines.
* The user should be able to change the language of the ATM machine, in case he doesn’t speak the original language.

Interface requirements:

* The design should be easy to use to allow every customer to use it.
* The screen should fix to the ATM machines.

Infrastructure requirements:

* The operative system should have security to ensure all the details of the user are save and nobody can access to it.

**[25 marks]**

1. Create a Use Case Diagram.

**[6 marks]**

1. Create a Gantt Chart to manage development process.

|  |  |  |  |
| --- | --- | --- | --- |
| **What to do?** | **Start day** | **End day** | **Days** |
| Create the design for the system. | 08/05/2023 | 13/05/2023 | 6 days |
| Develop the different parts. | 14/05/2023 | 24/05/2023 | 11 days |
| Implement security and support. | 25/05/2023 | 29/05/2023 | 5 days |
| Do test of the different parts of it. | 30/05/2023 | 03/06/2023 | 5 days |
| Deploy and give the project to the user. | 04/06/2023 | 06/06/2023 | 3 days |

**[10 marks]**

1. Provide an example code snippet, in any programming language, that includes the class name, function name, and any other necessary variables, to demonstrate how to achieve the goals of this project. You do not need to include the implementation details of the functions. Please show class diagrams or template code.

**Code done in java with two classes:**

Class user();

public int userID;

public String userName;

public int userPin;

public float accountBalance;

public void user(userID, userPin){

}

Class ATM();

user user = new user();

public float balanceAcc;

public float amount;

public void checkUser(int userId, int userPin){

}

public void withdraw(float amount){

}

public void deposit(float amount){

}

public void seeBalance(int userID){

}

**[20 marks]**

1. Provide a detailed explanation of the validation and verification process that should be followed to ensure the successful completion of this project.
   1. Do test of the different functionalities of the project by individual, to make sure all work well.
   2. Do test for the different functionalities, but this time checking if they work one with each other and there are no problems.
   3. Show to the user to check if all the requirements that they want are done and if it works as they want.
   4. Check the security and the different security branches that could be in the project to make sure all work correctly.
   5. When new changes or updates are done, check if all the previous functionalities still work properly.

**[15 marks]**

1. Create a repository on GitHub and upload your answers to it. Please note that the answers on GitHub will not be considered for marking, so it is essential to submit all your answers to Moodle before the exam deadline.

https://github.com/GuillermoRS1/FinalExam\_Software\_71235.git

**[5 marks]**

**[Total 100 marks]**