**Question 1:**

**BAHRIA UNIVERSITY (KARACHI CAMPUS)**

**ASSGINMENT # 2 (CLO 2) – SPRING 2021**

# Introduction to Software Engineering (SEN-120)

Class: **BSE 2(B)** **Submission Deadline: 6th April, 2021**

Course Instructor: **Engr. Mobeen Nazar** Max Marks:**10**

Using your knowledge of how an ATM is used, list down some of details that could serve as a basis for understanding the requirements (Functional & Non-Functional) for an ATM system.   
  
**ATM SYSTEM:**   
 ATM stands for (**Automatic Teller Machine**). It is a computer-based machine, connected to a network, that offers basic functions to users, access to bank account (balance, bank transfers) and retrieval of money.  
  
**Uses:**   
  
**Insert ATM Card  
Enter Pin**(After validation of the PIN. The user selects one of the six options representing a banking service.)   
**Withdrawal:** The user withdraws cash from the ATM.   
**Deposit:** Deposit cash into the ATM.   
**Bill Payment:** The user selects payment & enter bills into the ATM that are to be paid. The user also can enter up to 3 bills in one transaction.  
**Account Update:** The user selects account update, and a balance is displayed for the account.  
**Print Transaction Record:** ATM prints a record after a transaction.  
**Exit:** User completes session with ATM and retrieves card.   
  
 **Functional Requirements:** These requirements are observable task or process that must be performed by the system under development. Example (Must process withdrawals and dispense cash to the customer).  
  
#) The card reader determines the account number from the card.  
#) The User is prompted to enter a PIN after a card is entered.  
#) The keypad accepts input from the user.  
#) A menu is displayed to the user with the options.  
#) The cash dispenser is aware of the cash amount available.  
#) The cash dispenser can dispense cash.  
#) A transaction record can be printed upon demand.  
#) The card is ejected when the session is completed.  
#) Transactions can be cancelled at any prompt by the user pressing the CANCEL button.  
  
**Non Functional Requirements:** These systems are qualities or standard that the system under development must have or completely with, which are not tasks that will be automated by the system. System must be secured against Trojan attacks.  
#) A PIN must be entered within 20 seconds.  
#) The user must enter the PIN correctly within three attempts.  
#) ATM suspends further access using a particular card if the associated PIN is entered incorrectly 3 times in succession.  
#) ATM must be secure.  
#) The cash dispenser can be opened and refilled with cash.  
#) The printer can be opened and refilled with paper.   
#) ATM can be shut down and restarted.

**Question 2:**

Explain & Illustrate V- Model, what is the key thing that is focused in this Process-Model?  
  
  
**V-Model** The V-model is an SDLC model where execution of processes happens in a sequential manner in a V-shape. It is also known as **Verification and Validation model**. In this, each phase of SDLC must complete before the next phase starts. It follows a sequential design process same as the waterfall model. Testing of the device is planned in parallel with a corresponding stage of development.  
  
**Verification:** It involves a static analysis method (review) done without executing code. It is the process of evaluation of the product development process to find whether specified requirements meet.  
  
**Validation:** It involves dynamic analysis method (functional, non-functional), testing is done by executing code. Validation is the process to classify the software after the completion of the development process to determine whether the software meets the customer expectations and requirements. So, V-Model contains Verification phases on one side of the Validation phases on the other side. Verification and Validation process is joined by coding phase in V-shape. Thus, it is known as V-Model.  
  
**The various phases of Verification Phase of V-model  
  
Business requirement analysis.  
System Design.  
Architecture Design.  
Module Design.  
Coding Phase.  
  
The various phases of Validation Phase of V-model  
 The key thing that is focused on V-Model Process Model is testing. In this process model, there are four testing phases.**  
**Unit Testing:** In the V-Model, Unit Test Plans (UTPs) are developed during the module design phase. These UTPs are executed to eliminate errors at unit level. A unit is the smallest entity which can independently exist, e.g., a program module. Unit testing verifies that the smallest entity can function correctly when isolated from the rest of the units.

**Integration Testing:**  
 Integration test plans are developed during the Architectural Design Phase. These tests verify that groups created and tested independently can coexist and communicate among themselves.  
  
**System Testing:** System Tests Plans are developed during System Design Phase. Unlike Unit and Integration Test Plans, System Tests Plans are composed by the client’s business team. System Test ensures that expectations from an application developer are met.  
  
**Acceptance Testing:** Acceptance testing is related to the business requirement analysis part. It includes testing the software product in user atmosphere. Acceptance tests reveal the compatibility problems with the different systems, which is available within the user atmosphere. It conjointly discovers the non-functional problems like load and performance defects within the real user atmosphere.  
  
**Advantages:** Simple and easy to use. Testing activities like planning, test designing happens well before coding. This saves a lot of time. Hence higher chance of success over the waterfall model.  
  
**Disadvantages:** Software is developed during the implementation phase, so no early prototypes of the software are produced. The V Model should be used for small projects where requirements are clearly defined and fixed.