National University of Computer and Emerging Sciences
Karachi Campus

Software Design and Architecture (SE2002)

Date: April 5th 2024

Course Instructor(s)

Syeda Rubab Manzar

Sessional-II Exam

Total Time (Hrs):	1
Total Marks:	30
Total Questions:	2

Roll No   Section   Student Signature

Do not write below this line

Attempt all the questions. Attempt all questions according to the sequence, any question answered other than the right sequence will NOT be graded!!

CLO # 3: Design and Implement OOD models and refine them to reflect implementation detail

Question 1: [10]

A customer schedules an appointment with an eye doctor for an examination. The eye doctor conducts the examination and prepares the prescription based on the results. The customer then visits the eyeglass store to select a frame and lenses for their glasses. The eyeglass store constructs the glasses according to the customer's preferences. After the glasses are ready, the customer tries them on. If the glasses fit properly, the customer pays for them and takes them home. However, if the glasses don't fit correctly, the eyeglass store adjusts the fit accordingly. The customer tries the glasses again, and this process is repeated until the glasses fit satisfactorily. Additionally, if the customer fails to visit the eyeglass store within a month of the examination, they are required to undergo another examination before proceeding with the selection and fitting of glasses.

Draw swim lane activity diagram for the above scenario.

CLO # 4: Apply and use UML to visualize and document the design of software systems.

Question 2: [2*10=20]

a) The Customer types the name of an author on the Search Page and then presses the Search button. The system ensures that the customer typed a valid author name. If the customer did not type a valid author name, the system displays an error message to that effect and prompts the customer to type a search phrase until the customer provides a valid author name. For valid author name, the system searches the Catalog and retrieves the important details about all of the Books with which that Author is associated, and creates a Search Results object with that information. Then the system displays the list of Books on the Search Results Page, with the Books listed in reverse chronological order by publication date, and an Add to Shopping Cart button. The Customer presses the Add to Shopping Cart button for a particular Book. The system passes control to the Add Item to Shopping Cart use case.

Design sequence diagram for the above use case using Jacobson notation.

b) Consider a vending machine that dispenses drinks. Assume the vending machine performs following sequence of events:

- The vending machine starts in the Idle state.
- A user inserts a coin and the machine transitions to the AcceptingCoins state at time t=0
- The machine remains in the AcceptingCoins state for 10 units of time And then the machine transitions to the SelectingDrink for 5 units of time.
- Once a drink is selected, the machine transitions to the DispensingDrink state and remains there for 15 units of time before returning to the Idle state.

Draw a UML timing diagram representing the transitions between vending machine states along with the duration spent in each state.

Best of luck!!!!!!!!!!