National University of Computer and Emerging Sciences, Lahore Campus

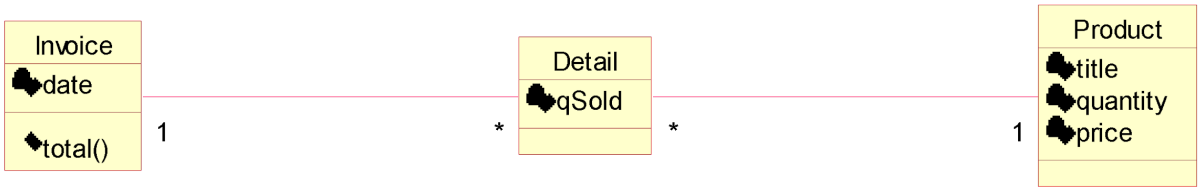
Course Name:	Software Design & Analysis	Course Code:	CS3004
Program:	BS (CS)	Semester:	Spring 2022
Duration:	One hour	Total Marks:	30
Paper Date:	09-May-2022	Weight:	
Section:	(All)	Page(s):	3
Exam Type:	Second midterm		

Student : Name:_____ **Roll No.**_____

Write your answers on this question paper; do not attach any additional sheet.

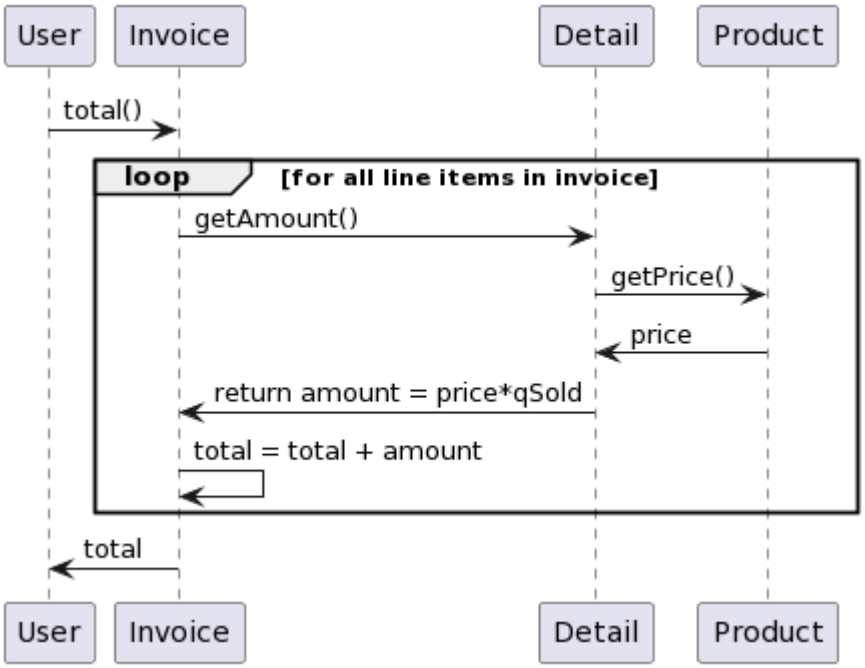
Question 1 [CLO 3 & 4]

Consider the following class diagram for a Point-of-Sale system:



The system prepares an invoice for each sale. An invoice tracks the products sold along with their quantity. Here "quantity" is the total quantity of the product, while "qSold" is the quantity-sold.

Now give a sequence diagram to show computation of the total amount of an invoice. If you like you may add any additional functions in the above classes.



Question 2 [CLO 3 & 4]

Consider the following use case description:

Use case: Withdraw cash

System: ATM

Steps:

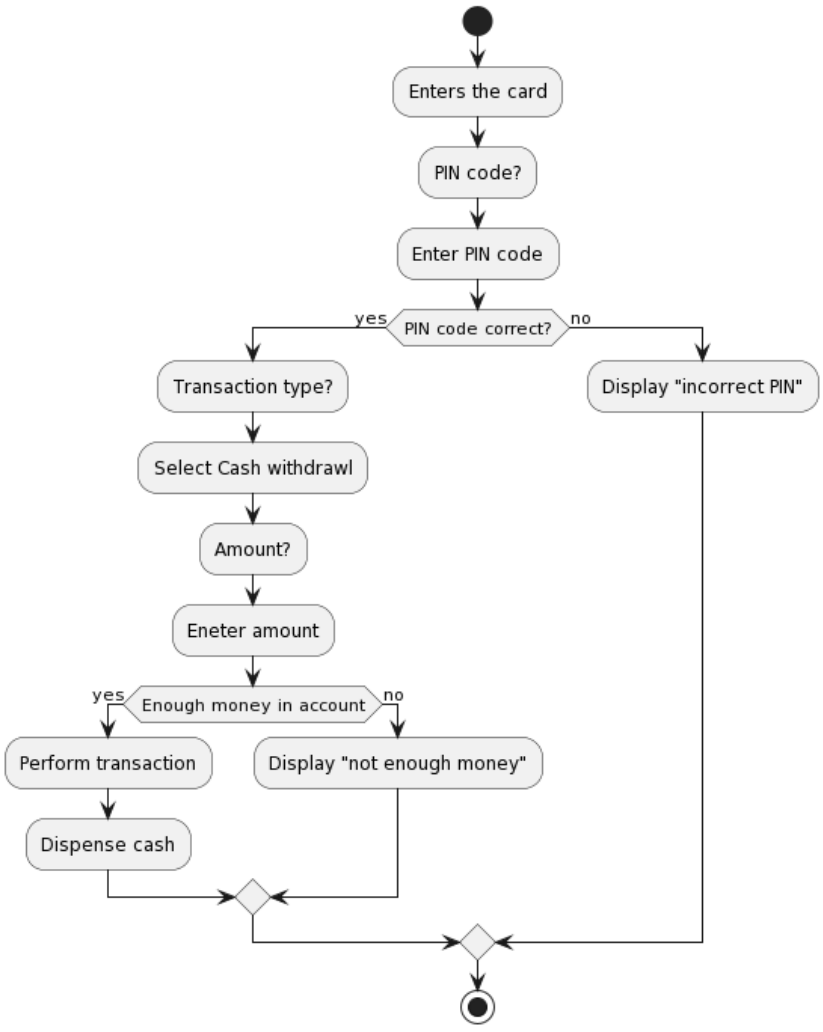
i. User enters the card
ii. System prompts for the PIN code
iii. User enters the PIN code
iv. System asks for type of transaction
v. User selects "Cash withdrawal" option
vi. System asks for amount of money
vii. User enters a number
viii. System performs the transaction and dispenses cash

Alternate paths:

iv (b) If the PIN code is incorrect the system generates an appropriate error, and halts the transaction

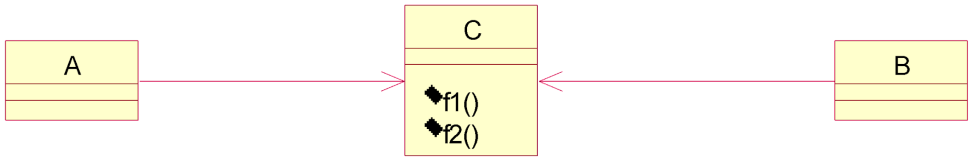
viii (b) If there is not enough money in the user's account the system shall display an error and shall cancel the transaction

Now your task is to give an Activity diagram to graphically depict the above use case.



Question 3 [CLO 2 & 5]

Consider the following class diagram:



Situation is that the class A uses function f1 only, while the class B uses function f2 only. Secondly in future we may need to replace the class C with another class D or E, which also provides functions f1 and f2. Now redesign the system in the light of the SOLID principles.