National University of Computer and Emerging Sciences

Lahore Campus

Fundamentals of Software Engineering (CS2004)

Sessional-II Exam

Date: April 06th 2024

Course Instructor(s)

Ms. Ansa Liaqat

Total Time (Hrs):	**1**
Total Marks:	**40**
Total Questions:	**2**

22L-7556 Roll No

BDS-4A Section

Student Signature

Do not write anything on the question paper except the information required above.

Instructions:

1. Read the question carefully, understand the question, and then attempt your answers in the provided answer booklet.
2. Verify that you have **Two (2)** printed page of the question paper including this page. There are **Two (2)** questions.

CLO#3: Learn to model the requirements of software system

Question 1: **[6+9=15 Marks]**

Remote Pair Programming System

Pair programming is an agile software development technique in which two programmers work together at one work station. One types in code while the other reviews each line of code as it is typed in. The person typing is called the driver. The person reviewing the code is called the observer. The two programmers switch roles frequently (possibly every 30 minutes or less). Suppose that you are asked to build a system that allows Remote Pair Programming. That is, the system should allow the driver and the observer to be in remote locations, but both can view a single desktop in real-time. The driver should be able to edit code and the observer should be able to "point" to objects on the driver's desktop. In addition, there should be a video chat facility to allow the programmers to communicate. The system should allow the programmers to easily swap roles and record rationale in the form of video chats. In addition, the driver should be able to issue the system to backup old work.

To do: Propose a set of classes that could be used in the above system and present them in a class diagram.

Note: You only need to include entity objects in your class diagram.

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CLO#3: Learn to model the requirements of software system

Question2: **[10+15=25 Marks]**

JazzN!ghts is a famous Jazz festival, held in Zurich every year. Since its first edition in 1986, it has gone through several major changes regarding its structure, length and location, but the tickets have always been sold in a traditional way: through two events agencies. The organizers decided to completely modernize the tickets selling system and created the following concept.

From this year on, the tickets will be sold in three distinct ways: traditionally, i.e. by the two events agencies, in electronic format directly on the festival website, and through SBB. All parties will have access to the same unique tickets database of the new system, to avoid double selling. A partnership with the SBB railway company needs to be set up, such that SBB can sell combi-tickets including both the festival admission fee and the train ride to the festival venue at reduced price, from anywhere in Switzerland. This way, more music fans would have easier and cheaper access to JazzN!ghts. Moreover, the system will have to be extended to support not only German, but also English, French and Italian. Since tickets will also be sold online, SecurePayment Inc. will be contracted to provide and ensure the security of the online payment service. The JazzN!ghts event manager will take care and negotiate all these details with the involved parties.

Additionally, upon arrival at the festival venue, each participant has to self-check in at a touch screen terminal, which scans the barcodes on his/her ticket and issues a bracelet with an electronic chip. This can be used to load money, such that whenever (s)he wants to purchase snacks or beverages, (s)he does not have to use cash any more, thus reducing waiting times. This measure was initiated by the program manager and will be deployed by WristSolutions Inc. Lastly, according to the cantonal laws, the way the payment transactions are performed has to be audited by an external company at the end of the festival, since this is a public event, where the municipality of Zurich is also involved - allowing free use of the public space.

Question 2: Part a

Draw a context diagram of the new JazzN!ghts tickets selling system. Make sure you label the actors, the relationships between them as well as their relationships to the system.
Note: Do not forget to document your assumptions, if you make any.

Question 2: Part b

Identify all the use cases in the JazzN!ghts case study and represent them in a UML use case diagram.
Note: Do not forget to document your assumptions, if you make any.