

National University of Computer and Emerging Sciences, Lahore Campus



Course: Software Engineering
Program: BS (Computer Science)
Duration: 30 Minutes
Quiz Date: 21-March-23
Section: 6D

Course Code: CS-3009
Semester: Spring 2023
Total Marks: 10
Roll No.
Name:

Question 1:

(5 Marks)

Provide a functional decomposition of the below mentioned system.

Suppose a company wants to develop a mobile app for managing personal finances. The app should allow users to track their expenses, set budgets, and view reports and analytics.

Using the functional decomposition diagram, the development team can identify the different components required for the finance management app. For example, the expense tracking component will allow users to enter and categorize their expenses, set reminders for recurring expenses, and view their spending history.

The budgeting component will allow users to set budget limits for different categories, track their progress towards their budget goals, and receive notifications when they exceed their budget.

The report and analytics component will provide users with visualizations and summaries of their financial data, allowing them to track their financial health over time and identify areas for improvement.

Finally, the user account and authentication component will handle user registration, login, and authentication, as well as enabling users to manage their personal information and view their account settings.

Finance Management App

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+-- Expense Tracking Component

| |

| +-- Enter and Categorize Expenses

| +-- Set Reminders for Recurring Expenses

| +-- View Spending History

|

+-- Budgeting Component

| |

| +-- Set Budget Limits for Different Categories

| +-- Track Progress Towards Budget Goals

| +-- Receive Notifications when Exceeding Budget

|

+-- Report and Analytics Component

| |

| +-- Visualize Financial Data

| +-- Summarize Financial Health over Time

| +-- Identify Areas for Improvement

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+-- User Account and Authentication Component

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+-- User Registration and Login

+-- Authentication

+-- View Account Settings

+-- Manage Personal Information

Question 2: Describe the following Architectural Style?

(5 Marks)

Architectural Style	Publish-Subscribe
Description	<p>It is a messaging pattern in which publishers produce messages and broadcast them, without knowing who or how many subscribers there are. Subscribers, on the other hand, receive messages from the message broker, to which they have subscribed, without knowing who the publishers are.</p> <p>This architecture style decouples the producers of messages from the consumers, making it easy to add new producers or consumers without affecting the existing system. It also enables the creation of a scalable, distributed system by allowing multiple subscribers to receive the same message, and it provides a flexible communication model that supports asynchronous communication between components.</p>
When to use	<p>Event-driven systems Distributed systems Real Time messaging Microservices architectures Social networks</p>
Advantages	<p>Decoupling of components Scalability Asynchronous communication Loose coupling Fault tolerance Easy to extend</p>

Disadvantages	Complexity increases Latency in delivering messages Does not maintain message ordering Message loss Difficult to test Security issues: Need to prevent from message tempering and unauthorized access
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