



University of Colombo School of Computing

SCS 1304 - Problem Solving Strategies and Computation Approaches

Lab Sheet 01

Abstraction and Decomposition.

Read the following description of an online food delivery system.

Imagine you are creating a system for ordering food online. This system will make it easy to order food from different restaurants and have it delivered to your door. The system will have several parts.

The **User Interface** will include features for user registration and login, allowing users to sign up to create an account and log in. Users should be able to browse a list of available restaurants and view their menus. The interface should also support order placement, where users can select items from the menu, add them to their cart, and place an order. For payments, the system should support various methods, ensuring payments are secure and providing payment confirmations. Additionally, users should be able to track the status of their orders in real-time, from preparation to delivery.

The **Restaurant Management** section will allow restaurants to register and create profiles on the system. Restaurants need to manage their menus, including adding, updating, and removing items. They should also be able to receive and manage orders placed by users.

The **Order Management** part is responsible for processing user orders, ensuring they are correctly logged and sent to the appropriate restaurant. This includes maintaining real-time status updates of each order, covering stages such as preparation, dispatch, and delivery.

Payment Processing is crucial for handling secure transactions. The system should support various payment methods, including credit/debit cards and digital wallets, and ensure that all transactions are secure and accurately recorded. Payment confirmations should be provided to users.

Delivery Management involves managing the assignment of delivery personnel to orders, optimizing delivery routes to ensure timely delivery, and providing real-time tracking for users to monitor their delivery progress.

Finally, **System Administration** involves administrative functionalities for managing users and their permissions, overseeing restaurant registrations and profiles, and analyzing data for improving the service. This includes analyzing user preferences, popular items, and delivery times.

Answer the following questions based on the above description.

- 01.** Identify and describe the high-level requirements for the online food delivery system. Provide at least three examples and explain why they are appropriate abstractions.
- 02.** Identify at least five modules and describe their responsibilities. How does this decomposition help in managing the complexity of the system?
- 03.** In what ways can abstraction and decomposition help improve the scalability and maintainability of the online food ordering system over time?
- 04.** Design a simple flowchart depicting the process of a user placing an order on an online food delivery system, considering both cash and card payment methods, with the option to cancel the order before finalization.

Consider the process below to draw flowchart.

Starting with the user logging into their account and browsing available restaurants, the flowchart should encompass steps such as selecting items, reviewing the order, and deciding on the payment method (cash or card). If the user decides to cancel the order at any point, they should be able to do so before finalizing the payment. Once the payment is processed securely, the order should be transmitted to the restaurant for preparation. If cash payment is selected, payment is made upon delivery, tracking the delivery progress, and concluding with the user receiving the order. Capture all these steps in a comprehensive flowchart that reflects the entire process from start to finish.

Complete the following quizzes as homework.

<https://www.bbc.co.uk/bitesize/guides/zp92mp3/test>

https://www.propofs.com/quiz-school/story.php?title=pp-computational-thinking_5yj

<https://www.knowitalnninja.com/quizzes/computational-thinking-aqa/>