CL1002
Programming Fundamentals

Lab 09
Tasks

NATIONAL UNIVERSITY OF COMPUTER AND EMERGING SCIENCES

Fall 2025

Amna Mubarak

LAB EXERCISES

Task 1 — Stationery Shop Management System

A local stationery shop wants to automate its daily sales operations. The shop sells multiple items such as pens, notebooks, and erasers.
Currently, the shopkeeper keeps records manually, but now wants a program to store and process this information digitally.

The shopkeeper maintains a **2D array** where each row represents an item,
the first column stores the **item name**, and the second column stores the **price**.

The program should allow the shopkeeper to perform several operations through a **menu-driven system**, where each option is implemented using a **function**:

1. **Add Items and Prices:** Enter new items with their prices.
2. **Fetch List of Items:** Display all available item names.
3. **Edit Price of an Item:** Search for an item and update its price.
4. **View All Items and Prices:** Display every item with its price.
5. **Generate a Receipt:** Let the user enter purchased items and quantities. The program calculates the total amount and prints a simple receipt.

If the total bill exceeds Rs. 5000, a discount can be applied.

Task 2 — Calendar Task Manager

A digital planner stores user tasks for all 12 months of the year. Each month is represented by an array, where each element stores a task for that day.

The user should be able to perform the following operations through **functions**:

1. **Add a Task:** Enter a month number, day, and task description.
2. **Remove a Task:** Specify a date to remove the existing task.
3. **View All Tasks:** Display all scheduled activities for the year.

To demonstrate functionality, some example tasks such as “Pay bills” or “Doctor appointment” can be preloaded in the program.
When a task is removed, the program should show the updated task list.

Amna Mubarak

Task 3 — Secure Password Generator

A security application needs to help users generate strong passwords. The program will begin by asking the user for basic personal details:

- Name
- Gender
- Contact number

After collecting details, it will ask for:

1. Minimum password length
2. Number of digits
3. Number of special characters

A fixed list of special characters is stored in an array:
['#', '$', '%', '&', '@', '!', '*', '+', '-', '?']

The program will use **functions** to:

- Combine parts of the name and contact number,
- Add random characters from the special character array using the rand() function,
- Ensure the final password meets the chosen length.

Finally, the password is displayed to the user.

Task 4 — Student Result Evaluation System

A school wants to compute the results of students based on their marks in multiple subjects.
Each student's marks are stored in a **1D array** for 5 subjects.

The program should be divided into **functions** that perform the following tasks:

1. **Input Marks:** Enter marks for 5 subjects.
2. **Calculate Total and Average:** Compute and return the total and average marks.
3. **Assign Grades:** Determine the grade based on average marks (A, B, C, or F).
4. **Display Result:** Show marks, total, average, and grade neatly.

Task 5 — Restaurant Order and Billing System

A local restaurant wants to build a small digital ordering system.
The program will show a **menu** of 5 food items, each with a fixed price.

Customers can order multiple items in a single session. The system should:

1. Display the menu.
2. Allow the customer to select items and quantities.
3. Calculate the total amount.
4. Apply a discount if the total bill exceeds Rs. 2000.
5. Print a bill showing the selected items, total price, discount (if any), and the net payable amount.

The entire menu and billing operations should be written using **functions**, and a **switch-case menu** can be used for navigation.

Task 6 — Fitness Progress Tracker

A fitness app helps users monitor their weekly performance.
The program records calories burned each day for 7 days in a **1D array**.

The system should:

1. Input the calories burned for each day.
2. Calculate total and average calories for the week.
3. Identify the most active day.
4. Display feedback messages such as "Excellent Progress", "Good Effort", or "Needs Improvement".

All calculations and outputs should be handled by separate **functions**.

Task 7 — Movie Review and Rating System

A streaming platform collects viewer ratings for 5 movies.
Each rating is an integer between 1 and 10, stored in a **1D array**.

The program should:

1. Ask the user to input ratings for all 5 movies.
2. Calculate the average rating for each.
3. Classify movies into performance categories: Excellent, Good, Average, or Poor.

Amna Mubarak

4. Display a summary showing each movie's rating and its category.

Task 8 — Shopping Discount Calculator

A retail store offers different discounts based on the total purchase amount.
The customer enters prices of items one by one, and the system calculates the total bill.

The program should:

1. Accept item prices until the user enters 0 to stop.
2. Compute the total purchase amount.
3. Apply a discount:
    - 20% if total > 5000
    - 10% if total between 3000 and 5000
    - No discount if below 3000
4. Display the total, discount, and final payable amount.

Task 9 — Displaying Array Elements Using Pointers

A program is required to store the marks of 5 students and display them using **pointers**.
Instead of using normal array indexing (like arr[i]), the program will use pointer notation (*(ptr + i)).

The program should:

1. Take marks of 5 students as input.
2. Display all marks along with their memory addresses.
3. Print the total and average marks.

Task 10 — Swapping Two Numbers Using Pointers

A simple calculator program needs to exchange the values of two variables without using a temporary variable.
The swapping will be performed using a function that takes **pointer parameters**.

The program should:

1. Ask the user to enter two integer values.
2. Pass their addresses to a swap() function.
3. Display the values before and after swapping.