CL1002
Programming Fundamentals

Lab 06
Tasks

NATIONAL UNIVERSITY OF COMPUTER AND EMERGING SCIENCES

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LAB EXERCISES

Task 1 – Airport Luggage Scanner

At an international airport, a smart luggage scanning system is used to automatically process every passenger's bag. As each bag goes through the scanner, the system checks if it contains any suspicious items. If a suspicious item is detected, the scanning immediately stops, and an emergency alert is raised for the security team. If no suspicious item is found, the system simply continues scanning the next bag until all bags are processed. After the last bag has been scanned without issues, the system displays a message saying, "All bags cleared successfully." Write a program using a loop to simulate this luggage scanning process.

Task 2 – Library Book Return Fine Tracker

A city library has implemented a digital fine system for late book returns. For every day a student is late in returning a book, the fine amount increases by Rs. 5. On the first late day, the fine is Rs. 5, on the second day Rs. 10, on the third day Rs. 15, and so on. The program should ask how many days late the book was returned and then calculate the total fine by simulating each day's addition. At the end, the program should display the complete fine amount to be paid. Write a program that uses a loop to compute the fine in this manner.

Task 3 – Elevator Simulation

A modern building elevator system starts from the ground floor and moves upward one floor at a time until it reaches the passenger's requested floor. At each floor, the elevator announces the floor number it has reached. Once the elevator arrives at the requested floor, it displays the message "You have arrived at your destination." If the requested floor number is invalid (for example, below 0 or above 50), the system should show an error before starting. Write a program using a loop to simulate this elevator journey.

Task 4 – Mobile Recharge Countdown

A prepaid mobile SIM card deducts Rs. 10 after every phone call. The balance is reduced call by call, and after each call, the system should display the new balance. This process continues until the balance falls below Rs. 10, in which case the user cannot make any more calls. At that point, the system should display the message "Recharge Required" and stop. Write a program that uses a loop to simulate this recharge countdown system.

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Task 5 – Online Exam Timer

In an online exam system, the exam timer counts down from the total time allocated to students. For example, if the exam duration is 30 minutes, the system should display the remaining time after each passing minute. The timer should keep counting down until it reaches zero, at which point the system automatically submits the exam and displays the message “Time Up – Exam Submitted.” Write a program using a loop to implement this timer simulation.

Task 6 – Smart Streetlight System

A smart city project is installing streetlights that turn on automatically at night. The system turns on lights one by one along a main road. If a light is detected as faulty, the system should skip it and move on to the next light. Once all lights have been processed, the system should display the message “Streetlight activation complete.” Write a program using a loop to simulate this smart streetlight process.

Task 7 – Fuel Pump Dispenser

At a petrol station, fuel is dispensed liter by liter into vehicles. The dispenser keeps track of the number of liters filled and the running total cost of fuel. The dispensing process continues until the customer’s requested number of liters has been filled. After filling is complete, the dispenser displays the total liters dispensed and the total cost. Write a program using a loop to simulate this fuel pump system.

Task 8 – Password Strength Validator

A secure system requires the user to create a password. The password must be at least 6 characters long. The user has a maximum of 5 attempts to enter a valid password. If the user enters a valid password within these attempts, the system confirms success and allows access. If all 5 attempts are used without success, the system displays the message “Account Locked.” Write a program using a loop to simulate this password validation process.

Task 9 – Train Ticket Checker

A train conductor is tasked with verifying the number of passengers in each compartment of the train. Each compartment can hold up to 10 passengers. The program should loop through all compartments and record the number of passengers. If a compartment is empty, the system should display “Compartment Empty” but continue checking the next compartments. At the end, the system should display the total number of passengers traveling on the train. Write a program using a loop to simulate this ticket checking process.

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Task 10 – Space Mission Fuel Burn Simulation

During a rocket launch, the spacecraft burns fuel in multiple stages. In each stage, 100 liters of fuel are consumed. The system should keep reducing the available fuel and display the remaining amount after every burn stage. Once the fuel drops below 100 liters, the rocket enters its "Final Stage." At this point, the system should display the message "Final Stage Reached" and stop the simulation. Write a program using a loop to model this fuel burn process.

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