

COAL Lab

(EL2003)

Date: October 17th 2024

Course Instructor(s)

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Lab Mid Exam (B)

Total Time: 90 minutes

Total Marks: 20

Total Questions: 04

Semester: Fall-2024

Campus: Karachi

Dept: Computer science

- Create separate text files for each question and paste your solution code and create a word file for all screen shots of your outputs.
- Create a ZIP folder of all your files and copy it in the local storage with the title K23-xxxx_A.
- Submission is on local storage that can be accessed using win+r keys and entering \\172.16.5.43 address in the dialog box.
- Enter your username as khifast\K23xxxx and its assigned password.

CLO # 2:

Q1.

[5 marks]

You are tasked with writing an assembly language program for an expense tracker that monitors expenses across two categories over two months. The system will analyze and adjust expenses based on user input. The system should work with signed and unsigned values and perform various arithmetic and logical operations.

1. Start by defining two signed 8-bit integers (expenseCategoryA and expenseCategoryB) representing expenses in two different categories. Define an unsigned 16-bit integer (totalIncome) to store the total income received.
2. Load the values of expenseCategoryA and expenseCategoryB into registers, ensuring the 8-bit signed integers are extended to 32-bit registers using sign-extension. Also, load the value of totalIncome and zero-extend it to a 32-bit register.
3. Calculate the total expenses by adding the values of expenseCategoryA and expenseCategoryB.
4. After calculating total expenses, increment the expense in Category A (expenseCategoryA) by a fixed amount (e.g., 10).

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- ✓5. Swap the values of expenseCategoryA and expenseCategoryB in the registers to simulate a stock error.
- ✓6. Subtract total expenses from totalIncome to find out how much money is left after accounting for expenses.
- ✓7. If the remaining income is negative, negate it to indicate a deficit and store the result in a register.
- ✓8. Output the final results: the total expenses, adjusted expenses for Category A, and the remaining income (indicating whether it is a surplus or deficit).

CLO # 2:

Q2.

[5 marks]

Consider yourself a customer creating a library account. Write an assembly program that inputs the user's name and their preferred genre of books. The program should generate a random library card number for the user. Finally, display the user's assigned library card number in a message box. What is the output in the Message Box? Explain.

CLO # 2:

Q3.

[5 marks]

Develop an Order Tracking System for a bakery that offers three types of cakes. Each week, the bakery owner records the number of cakes sold for each type and computes the total sales across four weeks. The system will store sales data for each cake type in four separate arrays, one for each week, using indexed addressing for efficient access. The user will input the sales count for each cake type over the four weeks, saving each count in the respective index of the corresponding week's array. After all counts are entered, the program will calculate the total cakes sold by summing the corresponding values in each array, also using indexed addressing. Finally, display the total sales count for each cake type to the user with a formatted message, ensuring no loops are used.

CLO # 2:

[5 marks]

Q4.

Write an assembly program to construct the following pattern.

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8 8 8
8 8 8
8 8 8
8 8 8
9 9 9 9 9 9
9 9 9 9
9 9 9
9
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