National University of Computer and Emerging Sciences

Laboratory Manual

for

Computer Organization and Assembly Language Programming

Course Instructor	Aleena Ahmad
Lab Instructor	Sana Ejaz
Semester	Fall 2024

Department of Computer Science

FAST-NU, Lahore, Pakistan

OBJECTIVES:

- How to implement Conditional jumps.
- How to implement Unconditional jumps.
- How to implement sorting using jumps.

Instructions:

- Run and debug the programs, ensuring that they behave as expected.
- Submit work in a single Word file with Code and screenshots. No asm, lst , or com. (Do not submit a zip folder).
- Document your observations and note any issues encountered during implementation in the same word document as the code and screen shots.

Task 1: Write an assembly language program that compares two numbers stored in memory. If the first number is greater than the second, jump to a label that increments the first number by 1. Otherwise, jump to a label that decrements the first number by 1.

Hint: Use CMP, JG (jump if greater), and JMP instructions.

Task 2: Write a program that continuously loops through a series of instructions until a specific condition is met. For this task, increment a counter until it reaches a certain value, and then use an unconditional jump to exit the loop.

Hint: Use JMP for the unconditional jump and CMP for condition checking.

Task 3: Implement a bubble sort algorithm to sort an array of 5 numbers in ascending order using conditional and unconditional jumps.
arr dw 5, 3, 8, 4, 1.

Task 4: **Implement a selection sort algorithm to sort an array of 6 numbers in descending order. Use jumps for the comparison and swapping logic.**

Hint: Use two loops.