Islamic University of Technology (IUT)

Electrical and Electronic Engineering Department

ASSIGNEMENT

Course No.: **EEE 4616** **Course Title:** Microprocessor and Assembly Language Programming Lab

Academic Year: 2022- 2023 **Semester:** Summer

1. Statement of the problem. [**Marks: 30** **COs:** CO1, CO2 **]**

On a sunny day in 1980, you and your friend went to a store and bought **n** number of items for your friend's home. Returning home, your friend was expected to report the list of items and their prices in an ascending order. The catch was, no notepad was in hand. Fortunately, your friend had a programmable 8086 processor kit with him and the friendly shopkeeper, skilled in typing, agreed to help with data entry. So your friend asked you, an efficient coder, to write an assembly code so that the processor would ask the shopkeeper to enter the name of each item and its price.
Upon listing all items name and price, you noticed that the prices were entered in a scattered manner. Learning this issue your friend again asked you to write a sorting algorithm based on either bubble sort or quick sort you had learned in the school.

Tasks

1. Compose an assembly program that receives input for item names and corresponding prices sequentially, storing the information.

2. Write down an assembly program to arrange the prices in ascending order and display the complete list of items with their names and sorted prices.

3. Employ Binary Search Algorithm to find out all the items name with price more than 20$.

Targets

1. Minimize the number of operations.

2. Minimize the number of memory operations.

Questions

1. Which sorting algorithm is better to use considering the architecture of 8086 microprocessor. [Proper commenting of code blocks is a must]

2. Make a list of different types of operations you have executed. [if an instruction has memory then memory operation or register then it's a register operation and so on.]

3. Is the Binary search algorithm efficient enough to find all the item names with price 20$? Does the architecture of 8086 have any impact on the efficiency of this search algorithm?

Self-Study:

1. Bubble Sort Algorithm
2. Quick Sort Algorithm.
3. Binary Search Algorithm.

Evaluation:

1. Prepare a concise report addressing the tasks and questions.

A proper report will present the overall problem, its demands, solutions, asked questions and additional comments in such a manner that will help anyone with basic knowledge of assembly can understand. Moreover, the code will have proper commenting to explain the workflow.

2. You have to show the execution of code physically in your respective class time in the first week after the 'Eid vacation.

3. You will be asked questions while you will present your code and report.

Mark Distribution:

1. Report: 10 Marks

2. Execution of Code: 10 Marks

3. Question Answer: 10 Marks.