ACS Applied Computer Science

THE UNIVERSITY OF WINNIPEG

APPLIED COMPUTER SCIENCE

ACS-2906-001
Computer Architecture and System Software

Fall 2024

Assignment 2

Due date: November 10th, 11:59 pm **Total marks: 40**

Assignment Files:

The file Assignment2_handout.zip contains the following files:

- 8086_instruction_set.html: This is a a reference of the 8086 instruction set containing all of the instructions you will need for this assignment
- A2Q*.asm: Template file for each question
- debug.exe: This is the debugger used in class
- Input and Output (I O) in 8086 Assembly Language.htm: This is a reference for IO operations
- INT_21_DOS_Function_Dispatcher: This is a reference to all of the DOS functions available to your assembly program.
  - Hint, look at 9 and A.
- Intel_Defined_CPU_Exception_Table: Not really needed for this assignment. Basically, FYI.
- link.exe: Program linker
- masm.exe: Program compiler

Compiling and running your code:

All three of the source code files included in the handout can be compiled and executed. To execute your program, perform the following steps from the command line:

1. masm *progNam*.asm (hit enter at the subsequent prompts). Verify that there were no errors or warnings.
2. link *progNam* (hit enter at the subsequent prompts). Verify that there were no errors or warnings.
3. *progNam*.exe

Questions

1) Input

Problem: Write an X86-series assembly language program that reads a string from the user and stores it in the data segment. Assume the length of the string will be 20 characters or less (don't forget about the carriage return) and that the user will never enter more than 20 characters.

Sample Execution: There should be input at the command line and nothing else. You do not need to prompt the user for input.

2) Output

Problem: Modify your solution to Question 2. Prompt the user for input, and then respond to their input by echoing it to the command line.

Sample Execution: A sample execution of the program looks like the following.

```
Enter a string (max 20 char.)
012345678901234567890
The string you entered is:
012345678901234567890
```

Evaluation

Questions are worth 20 marks. 12 of the 20 marks are for correct output and algorithm implementation. The other 8 marks are style points based on subjective evaluation of the quality of your solutions and your comments.

Hand in instructions

Include your name and student number in all files. Comment, comment, comment! **Up to 5 marks will be deducted for students that do not follow instructions or submit poorly formatted work**. Submit your submission through Nexus. Only submit your .asm files and ensure they will compile before submission.