Experiment 2 – Memory and variable operations

2020-2021 Spring

Preliminaries:

1. Students who will attend to this experiment are assumed to know:
   - Usage of registers on 8086
   - Usage of memory operations on 8086
   - Usage of variables on 8086
   - Usage of addressing modes on 8086
   - Usage of emu8086
2. Study related topics from course slides and the textbook
3. Run example codes from slides and textbook
4. Study instruction set for 8086
5. Always comment your code!!

Work:

1. Write an assembly code that takes 10 characters of input from user using keyboard and writes the result to variable on memory named "indata". After getting all characters, your code should switch case of characters(lowercase to uppercase, uppercase to lowercase) and write the results to another variable in memory named "outdata".

   You have to test it with **your name** and **your hometown** with mixed up cases, such as "AhMEtsiVaS". Adjust the character count according to your needs.

   Example: Input: AhMEtsiVaS , Output: aHmeTSIvAs

   Hint: Consider ASCII table for switching case of characters.

   Hint: You can use "int 16h" to get input from user.

   Hint: You can use "int 21h" to print characters to screen.

2. Consider a variable named "somewords" that holds words delimited with space character(0x20 in hexadecimal). Write an assembly code that converts only the first letter of each word to uppercase. Result should be put in the same variable. You may optionally print the result to screen. **You should use passive and active electronic components as words in your code and variable.**

   Example: Variable "somewords" may be defined as such:
   `somewords db "apple raspberry orange banana",'$'`
   Result should be:
   `Apple Raspberry Orange Banana`

3. Consider the variable named "somewords" that holds words in previous quiestion. Use stack operations to reverse the whole string "somewords". Result should be written to the same variable. **You should use passive and active electronic components as words in your code and variable.**

   Example: Variable "somewords" may be defined as such:
   `somewords db "apple raspberry orange banana",'$'`
   Result should be:
   `ananab egnaro yrrebpsar elppa`

4. (Optional) Write down the names of registers that can be used in "Indirect addressing mode" .

5. (Optional) Write down the names of registers that can not be used in "Immediate addressing mode".

6. (Optional) Write down the names of registers that can not be written to in any addressing mode.

   Don't report anything in preliminary work for optional questions. You will be responsible for all questions during experiment.

Notes :

- **You should prepare a preliminary work report with the answers of the questions on the "Work" part.**
- **All answers should be in English, it may be better to put your assembly codes in a Text box for better readability, code parts has to use a Type Writer font like `Courier New`.**
- **Each answer code file should be uploaded to the system seperately. You should also upload a proper report containing all answers and results together with your comments.**