CIS 231 PROGRAMMING ASSIGNMENT 3: STANDARD INPUT

This assignment has 2 experiments. In the first experiment you will learn how to read one Ascii character from standard input of the tutorialspoint assembly online development environment and then print the Ascii character back to the console. In the second experiment you will modify the program from experiment 1 to convert an uppercase character to lowercase (without valid input checking)

EXPERIMENT 1: Read a character from standard input

OBJECTIVE: Learn how to read an Ascii character from standard input.

PROCEDURE: Enter the following code into the tutorialspoint NASM assembler

```
1  section .data   ;Data segment
2      userMsg db  'Please enter a character: '    ;Ask the user to enter a char
3      lenUserMsg  equ $ - userMsg             ;The length of the message
4      dispMsg db  'You have entered: '        ;Message for echo
5      char    db  0xff                        ;char default value 0xff
6      cr_lf   db  0xA, 0xD                    ;carriage return / line feed
7      lenDispMsg  equ $ - dispMsg             ;Length of Message for echo
8
9  section .text
10     global _start
11     _start:
12     ;User Prompt - 'Please enter a character: '
13     mov eax, 4          ;sys_write system call number
14     mov ebx, 1          ;stdout file descriptor
15     mov ecx, userMsg    ;message to write
16     mov edx, lenUserMsg ;message length
17     int 0x80            ;call kernel
18
19     ;Read and store the user input
20     mov eax, 3          ;sys_read system call number
21     mov ebx, 2          ;std_in file descriptor
22     mov ecx, char
23     mov edx, 1          ;5 bytes can be read
24     int 0x80
25
26     ;Output the message 'The entered number is: '
27     mov eax, 4
28     mov ebx, 1
29     mov ecx, dispMsg
30     mov edx, lenDispMsg
31     int 0x80
32
33     ;Exit code
34     mov eax, 1
35     mov ebx, 0
36     int 0x80
```

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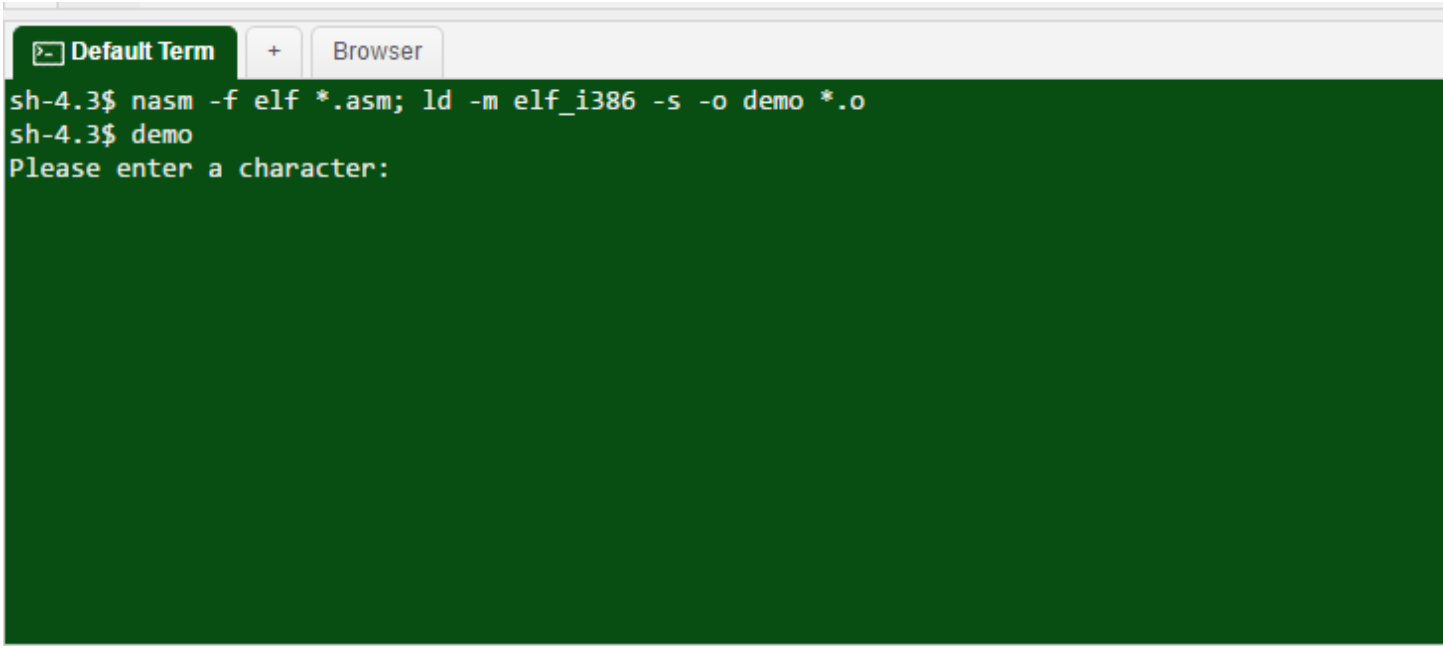
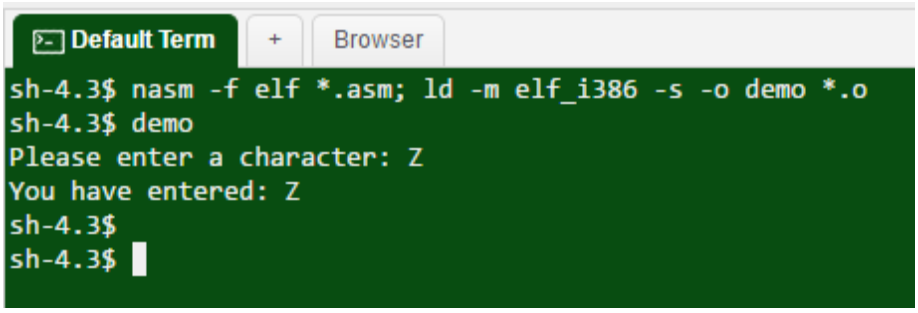
1. Once you have typed in the given program click Compile
2. If the program compiles without any errors click Execute (otherwise fix bugs and repeat step 1)
3. Once the program is running, a prompt will be displayed in the console. Click anywhere within the console window to have your keyboard stroke captured by the program



4. Enter a single keyboard character followed by the Enter key, the character you have entered will be displayed back to the console following the display message as it appears below:



5. If your program works correctly according to what appears in the image above, proceed to experiment 2

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EXPERIMENT 2: Convert Uppercase Character to Lowercase

Find the code base for experiment 2 at the following link:

https://cerritos.instructure.com/files/151373/download?download_frd=1

Lines 32, 33, and 34 have comments with clues as to how to complete the program.

```
31      ;convert character to uppercase
32                          ;put uppercase variable value into register A low byte
33                          ;add hex 20 to register A low byte value
34                          ;put register A low byte into lowercase variable
```

Your task is to complete the three lines of code to make the program work correctly

WHAT TO TURN IN:

After correct operation of your program in Experiment 2 has been verified:

1. Save your assembly source file
2. Upload your assembly source file to Programming Assignment 3 submission box on Canvas
3. Have a great day!