

CSCE 206 Fall2019 Lab: Assignment #4

Submission Deadline: 23:59, Nov 10, 2019, Sunday.

1. Follow the [submission guideline](#) to submit the assignment through eCampus.
2. Add comments to your code, including your name, UIN and the class section you are in with the block comments to the head of your code file.
3. **!!!Name your folder with UIN and Full Name then zip to submit!!!**

Question 1. Characters Convert & Reverse (50 points)

Write a C program to accept characters input. Convert all little letters to big letters and all big letters to little letters (25 points). Then reverse its order to output (25 points). Name your program file **Lab4_q1_code.c**.

Suppose all characters typed in have no space inside. For instance:

1. "aBcDef" is a characters with pure letters. Its conversion is expected to be "AbCdEF" and then its reversed order is expected to be "FEdCbA";
2. "BarackObama" is a characters with pure letters. Its conversion is expected to be "bARACKoBAMA" and then its reversed order is expected to be "AMABoKCARAb";
3. "I'm_in_TAMU_CollegeStation_77843" is another characters with letters, symbols, numbers. Its conversion is expected to be "i'M_IN_tamu_cOLLEGEStATION_77843". Its reversion is expected to be "34877_NOITATsEGELLOc_umat_NI_M'i".

Requirements are following:

1. **Not allowed** to use any other libraries as your head file except <stdio.h> or <math.h>. Write the conversion and reversion by yourself.
2. You can use **scanf** function to accept input.

Sample inputs/outputs:

```
Please type in the charaters :aBcDef
Convert little letter to big/big letter to little: AbCdEF
Reverse the converted characters: FEdCbA
```

```
Please type in the charaters :BarackObama
Convert little letter to big/big letter to little: bARACKoBAMA
Reverse the converted characters: AMABoKCARAb
```

```
Please type in the charaters :I'm_in_TAMU_CollegeStation_77843
Convert little letter to big/big letter to little: i'M_IN_tamu_cOLLEGEStATION_77843
Reverse the converted characters: 34877_NOITATsEGELLOc_umat_NI_M'i
```

Hint:

1. See Professor's Ch5 & Ch6 slides. Understand what a character is and what the ASCII is;
2. See Professor's Ch5 & Ch6 slides. Figure out how a C characters terminates;
3. Write a conversion and make it function well;
4. Then write a reversion based on your conversion and make it function well.

Question 2. Decimal Converter (50 points)

Hex is the fundamental how a computer stores and addresses its data in memory. Write a C program to accept characters of a nonnegative hex number and then convert it to its corresponding integer number (decimal) on screen. Name your program file **Lab4_q2_code.c**.

Requirements are following:

1. **Not allowed** to use any other libraries as your head files except `<stdio.h>` or `<math.h>`.
Write the conversion function by yourself.
2. Use **scanf** function to accept input and input type must be stored as a character array variable.
3. Probably you will need **switch** statement during your conversion.

For the hex number, *A, B, C, D, E, F* is 10, 11, 12, 13, 14, 15, respectively. Here are three instances of converting a hex number to its corresponding decimal:

$$(B0)_{16} = B \times 16^1 + 0 \times 16^0 = 11 \times 16^1 = 176 ;$$

$$(2C3D)_{16} = 2 \times 16^3 + C \times 16^2 + 3 \times 16^1 + D \times 16^0 = 2 \times 16^3 + 12 \times 16^2 + 3 \times 16^1 + 13 \times 16^0 = 11325 ;$$

$$(FEA16)_{16} = F \times 16^4 + E \times 16^3 + A \times 16^2 + 1 \times 16^1 + 6 \times 16^0 = 15 \times 16^4 + 14 \times 16^3 + 10 \times 16^2 + 1 \times 16^1 + 6 \times 16^0 = 1042966 .$$

Sample input/output:

```
Please input a hex number: B0
Its corresponding decimal is 176
```

```
Please input a hex number: 2C3D
Its corresponding decimal is 11325
```

```
Please input a hex number: FEA16
Its corresponding decimal is 1042966
```

Hint:

1. Check professor's slide Ch3, Ch5, Ch6. Figure out how to use if/else/switch and while/do-while statements. Also figure out how to properly convert a double or float type to a integer;
2. Try to read C characters of hex number first;
3. Then try to separate each letter from the hex number you read;
4. Convert each hex number to its correct decimal with its corresponding power and then sum them together.