

ECE160: Foundations of Computer Engineering I

Homework #3 Solution (Spring 2023)

(40 points)

Problems:

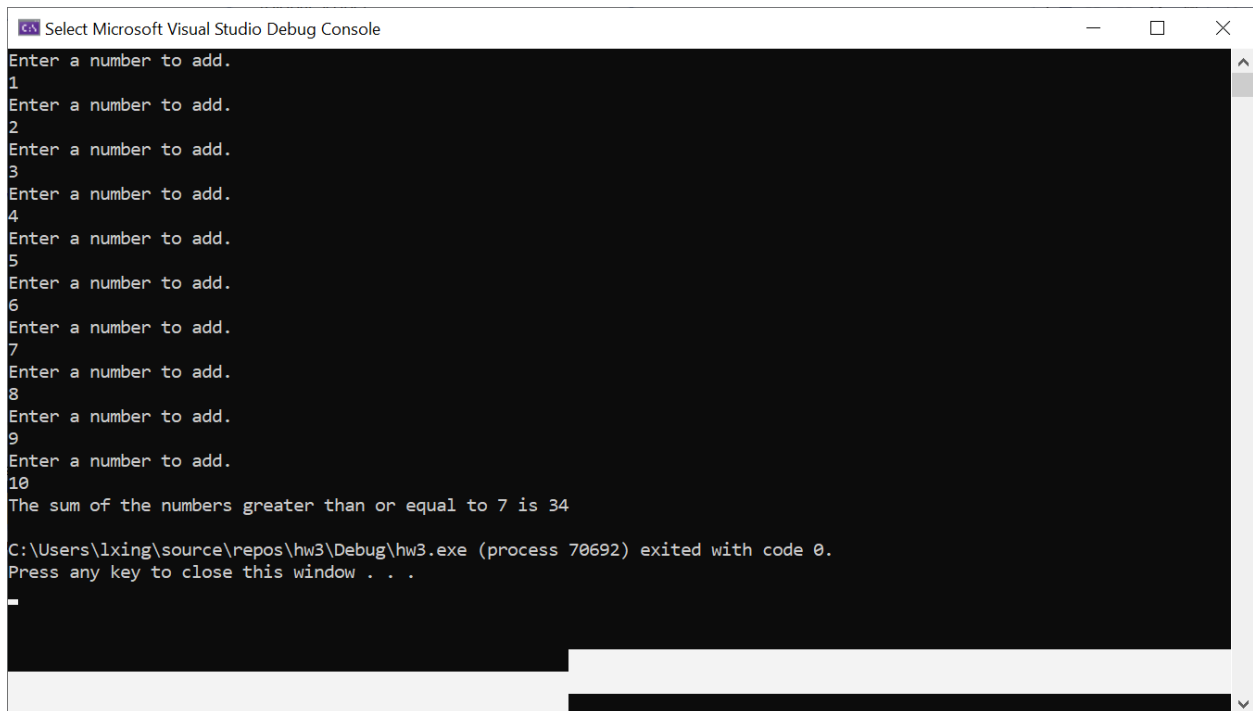
1. Write a complete C program that can perform the following consecutive tasks **(20 points)**:
 - a. **(8 points)** reads 10 integers from the keyboard. You are required to use a while loop to read the numbers.
 - b. **(9 points)** computes the sum of all the input integers that are greater than or equal to 7, and
 - c. **(3 points)** prints the sum.

An Example Solution:

```
#include <stdio.h>
void main(void)
{
    int x=0;
    int counter=1;
    int sum=0;

    while(counter<=10)
    {
        printf("Enter a number to add.\n");
        scanf_s("%d", &x);
        if (x>=7)
            sum+=x;
        counter++;
    }
    printf("The sum of the numbers greater than or equal to 7 is %d\n", sum);
}
```

Testing:



```
Select Microsoft Visual Studio Debug Console
Enter a number to add.
1
Enter a number to add.
2
Enter a number to add.
3
Enter a number to add.
4
Enter a number to add.
5
Enter a number to add.
6
Enter a number to add.
7
Enter a number to add.
8
Enter a number to add.
9
Enter a number to add.
10
The sum of the numbers greater than or equal to 7 is 34
C:\Users\lxing\source\repos\hw3\Debug\hw3.exe (process 70692) exited with code 0.
Press any key to close this window . . .
```

2. Write a program that prints the following two patterns separately one below the other. Use (nested) for loops to generate the patterns. All asterisks (*) should be printed by a single printf statement of the form printf("***"); (20 points; 10 points per pattern)

```
*
**
***
****
*****
*****
*****
****
***
**
*
```

Example Solution#1:

```
#include <stdio.h>

void main(void)
{
    int a;
    int b;

    for (a=1; a<=6; a++)
    {
        for (b=1; b<=a; b++)
        {
            printf("***");
        }
        printf("\n");
    }

    printf("\n\n");

    for (a=1; a<=6; a++)
    {
        for (b=1; b<=(7-a); b++)
        {
            printf("***");
        }
        printf("\n");
    }
}
```

Example Solution#2:

```
#include <stdio.h>

void main(void)
{
    int a;
    int b;

    for (a=1; a<=6; a++)
    {
```

```
        for (b=1; b<=a; b++)
        {
            printf("*");
        }
        printf("\n");
    }

printf("\n\n");

    for (a=6; a>=1; a--)
    {
        for (b=1; b<=a; b++)
        {
            printf("*");
        }
        printf("\n");
    }

}
```

Testing/Output:

```
Microsoft Visual Studio Debug Console
*
**
***
****
*****
*****

*****
****
***
**
*

C:\Users\lxing\source\repos\hw3\Debug\hw3.exe (process 79428) exited with code 0.
Press any key to close this window . . .
```