CIS 231 PROGRAMMING ASSIGNMENT 6: SUM OF DIGITS

Make a program to calculate the sum of the digits in a decimal quantity

```
sh-4.3$ demo
Enter numeric digits: 123
The sum of digits is: 6
sh-4.3$ demo
Enter numeric digits: 456

The sum of digits < 9
sh-4.3$ demo
Enter numeric digits: 45
The sum of digits is: 9
sh-4.3$ demo
Enter numeric digits: 1212
The sum of digits is: 6
sh-4.3$ demo
Enter numeric digits: 1143
The sum of digits is: 9
sh-4.3$
```

1st program execution.
Input from keyboard is 123 then Enter Key
Sum = 1 + 2 + 3 = 6

2nd program execution.
Input from keyboard is 456 then Enter Key
Sum = 4 + 5 + 6 = 15
The sum is greater than 9

3rd program execution.
Input from keyboard is 45 then Enter Key
Sum = 4 + 5 = 9

4th program execution.
Input from keyboard is 1212 then Enter Key
Sum = 1 + 2 + 1 + 2 = 6

5th program execution.
Input from keyboard is 1143 then Enter Key
Sum = 1 + 1 + 4 + 3 = 9

OBJECTIVE: Write a program that will *read a multi-digit quantity* through standard input and *if the sum of digits in the quantity is less than 10 the sum will be displayed* in standard output. The program will prompt for a number once and will terminate once it has been detected that the Enter Key was pressed. (This lab does not include valid input checking)

PROCEDURE: The C code that is shown below demonstrates how the program will be structured:

```c
#include <stdio.h>

char num = 0xff, sum = 0;

int main()
{
    printf("Enter numeric digits: ");
    do{
        num = getchar();
        if(num == 0x0a)
            break;
        sum += num&0x0f;
    }while(1);
    if(sum>9)
        printf("\nThe sum of digits < 9\n");
    else
    {
        printf("\nThe sum of digits is: ");
        putchar(sum|0x30);
        putchar(0x0a);
    }
    return 0;
}
```

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The program shown above runs an infinite loop that will only end when the press of the enter key has been detected. Upon exit of the infinite do-while loop, the sum is checked to see if it is greater than 9 in which case a message is displayed to indicate the sum is greater than 9, otherwise if the sum is less than 9 then the sum is Ascii encoded and written to standard output.

In NASM, to create this program use of the **compare** instruction (**cmp**) and appropriate conditional jumps must be used.

See pcasm-book.pdf **chapter 2.2 Control Structures** for information about compare and conditional jump instructions. Also see the follow example of a loop in NASM: dowhile.asm

A skeleton code named pa6skeleton.asm is given on Canvas for you to complete this assignment. Comments in the skeleton code give clues as to what instructions and operations you can perform to complete the assignment. Each code comment describes one instruction.

(There are many versions of the same code that will work for this assignment)

WHAT TO TURN IN:

After correct operation of your program in has been verified:

1. Save your assembly source file
2. Upload your assembly source file to Programming Assignment 6 submission box on Canvas
3. Have a great day!