CPSC 240: Computer Organization and Assembly Language
Assignment 06, Fall Semester 2023

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1. Download the “CPSC-240 Assignment06.docx” document.
2. Design the "print.asm" program to calculate the sum of "1+2+3+…+99" and displays the result in a terminal window.

```
Calculates    1+2+3+...+99 and displays the result in a terminal window
char str1[] = "1+2+3+...+99=";
register short cx = 1;
short sum = 0;
char ascii[5] = "0000\n";
for(cx=1; cx<=99; cx++)
        sum += cx;
ascii = itoa(sum);
cout << str1 << ascii;
```

3. Assemble the "print.asm" file and link the "print.o" file to get the "print" executable file.
4. Run the "print" file to display the conversion results of ascii in Terminal Emulator window.
5. Insert source code (print.asm) and simulation results (Terminal Emulator window) at the bottom of the document.
6. Save the file in pdf format and submit the pdf file to Canvas before 23:59 pm on 10/26/2023.

[Insert print.asm source code here]

```
 1 ; ex6_coutSum.asm
 2 ; Calculates  1+2+3+...+9 and displays the result in a terminal window
 3 ; char str1[] = "1 + 2 + 3 +...+ 99 = ";
 4 ; char ascii[3] = "00\n";
 5 ; short sum;
 6 ; register char cx = 1;
 7 ; for(cl=1; cl<=99; cl++)
 8 ;    sum += cl;
 9 ; ascii = itoa(sum);
10 ; cout << str1 << ascii;
11
12 section .data
13 str1    db      "1 + 2 + 3 +...+ 99 = "
14 ascii   db      "0000", 10
15
16 section .bss
17         sum     resw    1
18
19 section .text
20         global _start
21 _start:
22         ; calculates 1+2+3+...+9
23         mov     cx, 1
24 next1:
25         add     word[sum], cx                   ;sum += cl
26         inc     cx                              ;cx++
27         cmp     cx, 99                          ;compare cx with 9
28         jbe     next1                           ;if(cx<=9) goto next1
29
30         ; ascii = itoa(sum)
31         mov     rcx, 3
32         mov     ax, word[sum]                   ;al = [sum]
33 next2:
34         mov     dx, 0                           ;ah = 0
35         mov     bx, 10                          ;bl = 10
36         div     bx                              ;ah=(ah:al)%10, al=(ah:al)/10
37         add     byte[ascii+rcx], dl             ;ascii+0 = ah + 30h
38         dec     rcx
39         cmp     rcx, 0
40         jge     next2
41
42         ; cout << str1
43         mov     rax, 1                          ;SYS_write
44         mov     rdi, 1                          ;where to write
45         mov     rsi, str1                       ;address of str1
46         mov     rdx, 21                         ;21 character to write
47         syscall                                 ;calling system services
```

```
GNU DDD 3.3.12 (x86_64-pc-linux-gnu), by Dorothea LReading symbols from print...
(gdb)
```

[Insert print simulation result (Terminal Emulator Window) here]

```
student@tuffix-vm:~$ cd print
bash: cd: print: No such file or directory
student@tuffix-vm:~$ cd Desktop
student@tuffix-vm:~/Desktop$ cd print
student@tuffix-vm:~/Desktop/print$ ./print
1 + 2 + 3 +...+ 99 = 4950
student@tuffix-vm:~/Desktop/print$
```

[Insert print simulation result verification here]

$$\sum_{x=1}^{99} x$$

Evaluate the series using the formula.

4950

Tap to view steps...

Not the answer you were looking for?

Tap for more options...

```cpp

#include <iostream>

using namespace std;

int main()
{
   int sum = 0;
for(int cx=1; cx<=99; cx++)
{
    sum += cx;
}


cout << sum << endl;
    return 0;
}

```

```
4950


...Program finished with exit code 0
Press ENTER to exit console.
```