ASSIGNMENT # 2

Computer Organization and Assembly Language

MUHAMMAD HASSAM KHAN

SID: 11141

Note: Attempt all Questions by making code and output

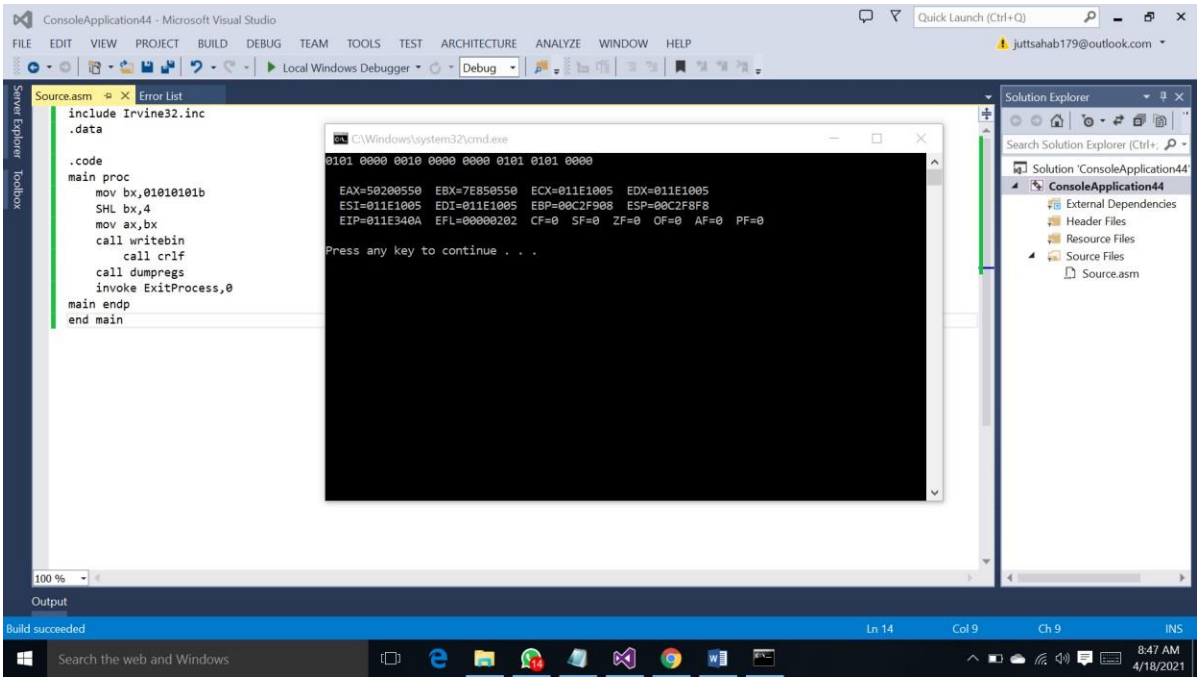
Question 1: **(2.5 Marks)**

Write assembly language code to multiply the value of BX by 4 using shift instructions and define which shift instruction causes multiplication of the destination operand.

CODE:

```
include  Irvine32.inc
.data

.code
main proc
        mov bx,01010101b
        SHL  bx,4
        mov ax,bx
        call   writebin
           call crlf
        call dumpregs
        invoke ExitProcess,0
main  endp
end  main
```

SCREENSHOT:



Question 2: **(2.5 Marks)**

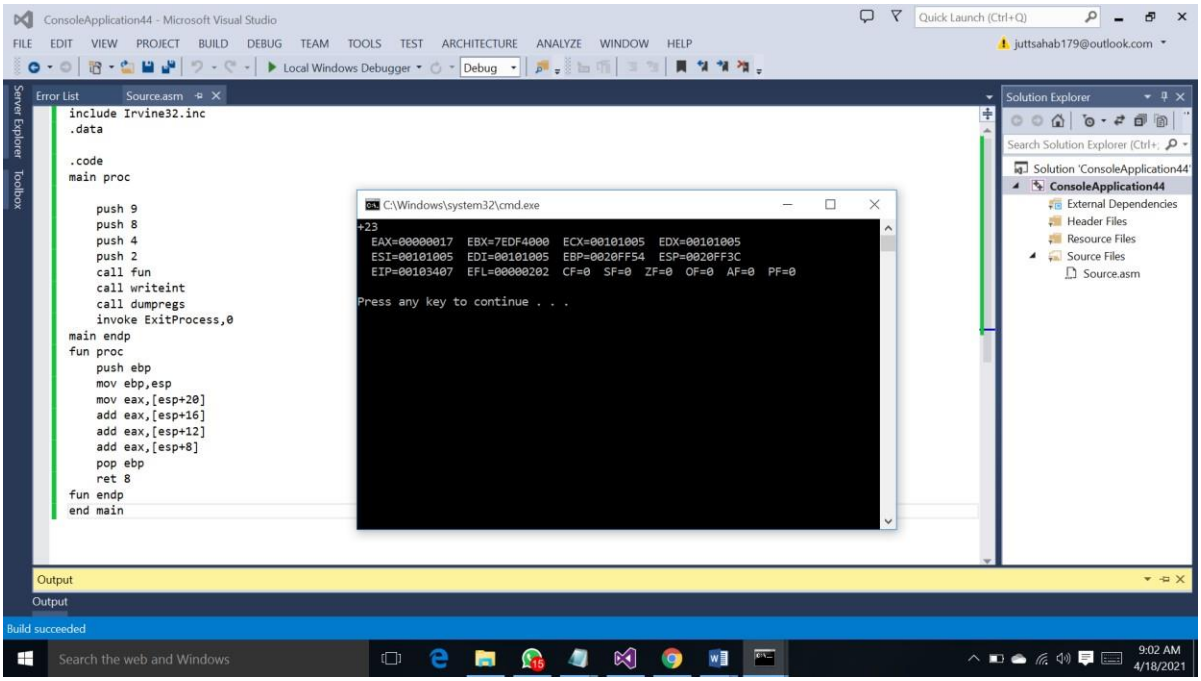
Write an assembly language program which finds the sum of the digits of your roll number using stack. *e.g.*
If your roll number is 13240
the answer should be "10".

CODE:

```
include  Irvine32.inc
.data

.code
main proc

        push 9
        push 8
        push 4
        push 2
        call fun
        call writeint
        call dumpregs
        invoke ExitProcess,0
main  endp
fun  proc
        push  ebp
```

```
        mov  ebp,esp
        mov eax,[esp+20]
        add eax,[esp+16]
        add eax,[esp+12]
        add eax,[esp+8]
        pop  ebp
        ret 8
fun endp
end main
```

SCREENSHOT:



Question 3: **(2.5 Marks)**

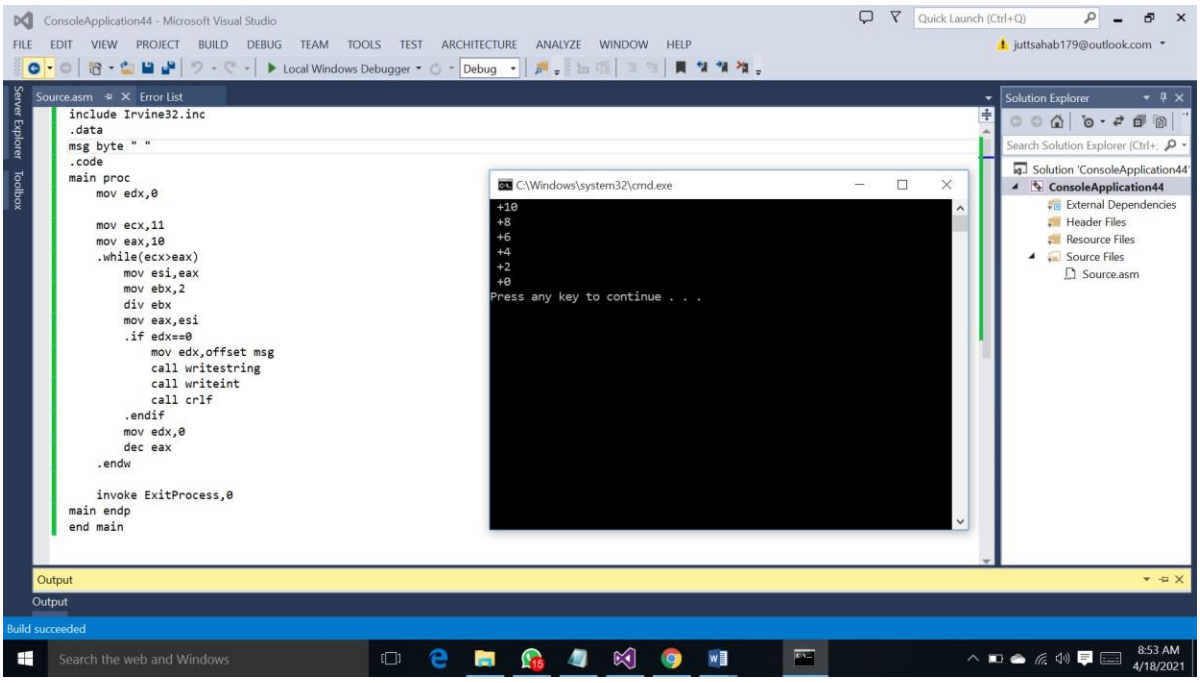
Write an assembly language program that prints values from 10 – 0 (only even) using while loop.

CODE:

```
include  Irvine32.inc
.data
msg byte "  "
.code
```

```
main  proc
        mov  edx,0

        mov ecx,11
        mov eax,10
        .while(ecx>eax)
                mov esi,eax
                mov ebx,2
                div    ebx
                mov  eax,esi
                .if edx==0
                        mov edx,offset msg
                        call writestring
                        call writeint
                        call crlf
                .endif
                mov edx,0
                dec  eax
        .endw

        invoke ExitProcess,0
main  endp
end  main
```

SCREENSHOT:



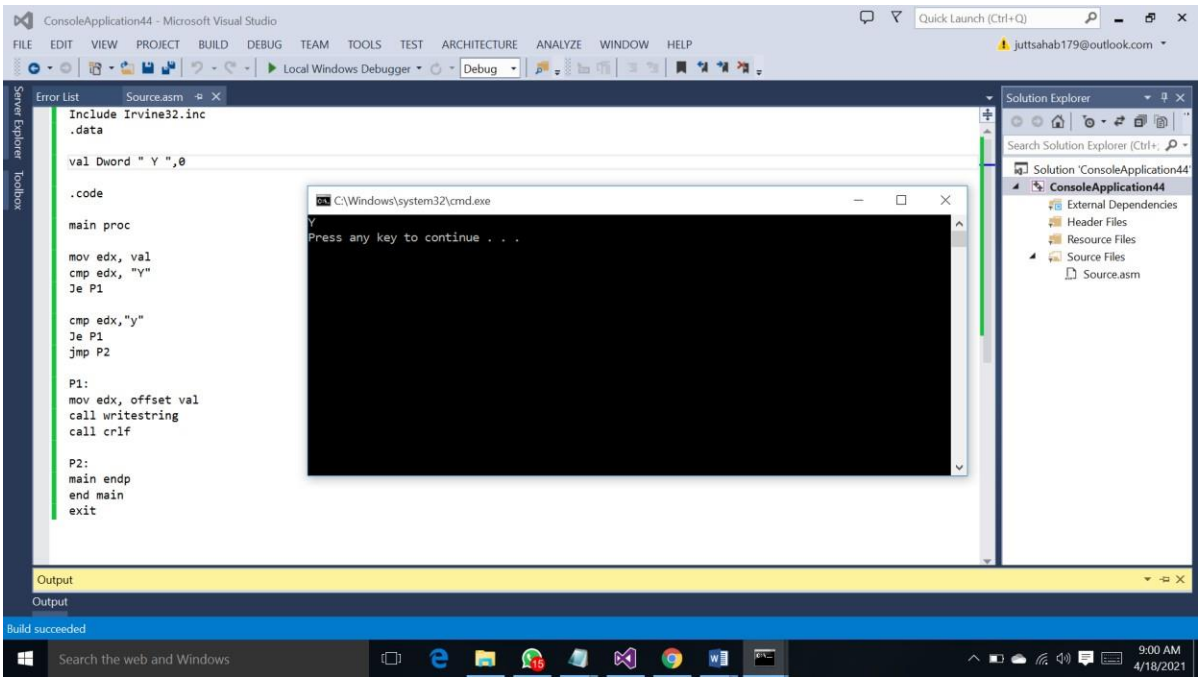
Question 4: **(2.5 Marks)**

Write an assembly language program that reads a character and prints it only if it is ‘y’ or ‘Y’ using (If-Else Structure).

CODE:

```
Include  Irvine32.inc
.data

val Dword " Y ",0

.code

main proc

mov edx, val
cmp edx, "Y"
Je  P1

cmp  edx,"y"
Je  P1
jmp  P2

P1:
mov edx, offset val
call writestring
call  crlf

P2:
main endp
end main
exit
```

SCREENSHOT:


ConsoleApplication44 - Microsoft Visual Studio
Quick Launch (Ctrl+Q)
FILE EDIT VIEW PROJECT BUILD DEBUG TEAM TOOLS TEST ARCHITECTURE ANALYZE WINDOW HELP
juttsahab179@outlook.com
Local Windows Debugger
Debug
Error List
Source.asm
Include Irvine32.inc
.data
val Dword " Y ",0
.code
main proc
mov edx, val
cmp edx, "Y"
Je P1
cmp edx,"y"
Je P1
jmp P2
P1:
mov edx, offset val
call writestring
call crlf
P2:
main endp
end main
exit
C:\Windows\system32\cmd.exe
Y
Press any key to continue . . .
Solution Explorer
Search Solution Explorer (Ctrl+;
Solution 'ConsoleApplication44'
ConsoleApplication44
External Dependencies
Header Files
Resource Files
Source Files
Source.asm
Output
Output
Build succeeded
Search the web and Windows
9:00 AM
4/18/2021