COAL HOME TASK 4A:

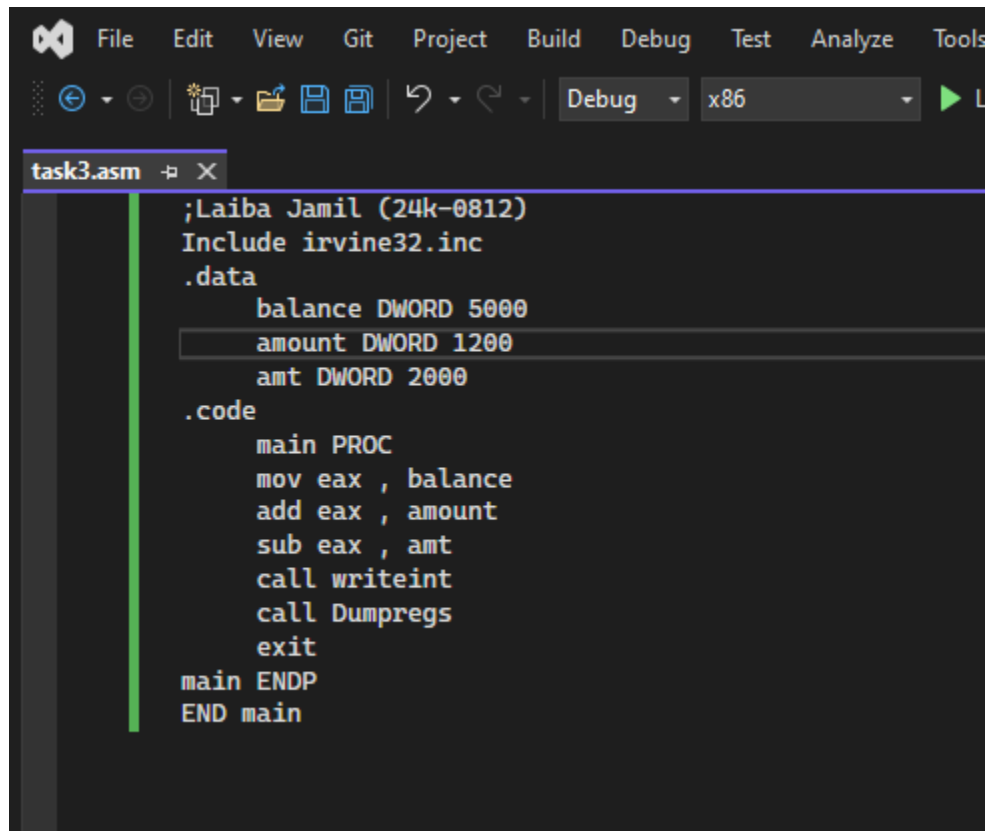## Task 1:

```
;Laiba Jamil (24k-0812)
Include irvine32.inc
.data
      s1 DWORD 45
      s2 DWORD 35
.code
      main PROC
      mov eax , s1
      mov ebx , s2
      mov ecx , s1
      mov edx , s2
      add eax , ebx
      sub ecx , edx
      call writeint
      call Crlf
      mov eax , ecx
      call writeint
      call Dumpregs
      exit
main ENDP
END main
```
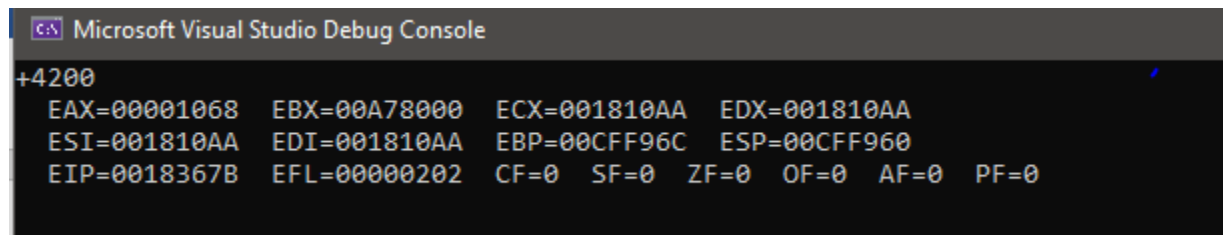
Microsoft Visual Studio Debug Console

```
+80
+10
  EAX=0000000A   EBX=00000023   ECX=0000000A   EDX=00000023
  ESI=00DE10AA   EDI=00DE10AA   EBP=00CFFF80   ESP=00CFFF74
  EIP=00DE3691   EFL=00000202   CF=0   SF=0   ZF=0   OF=0   AF=0   PF=0
```
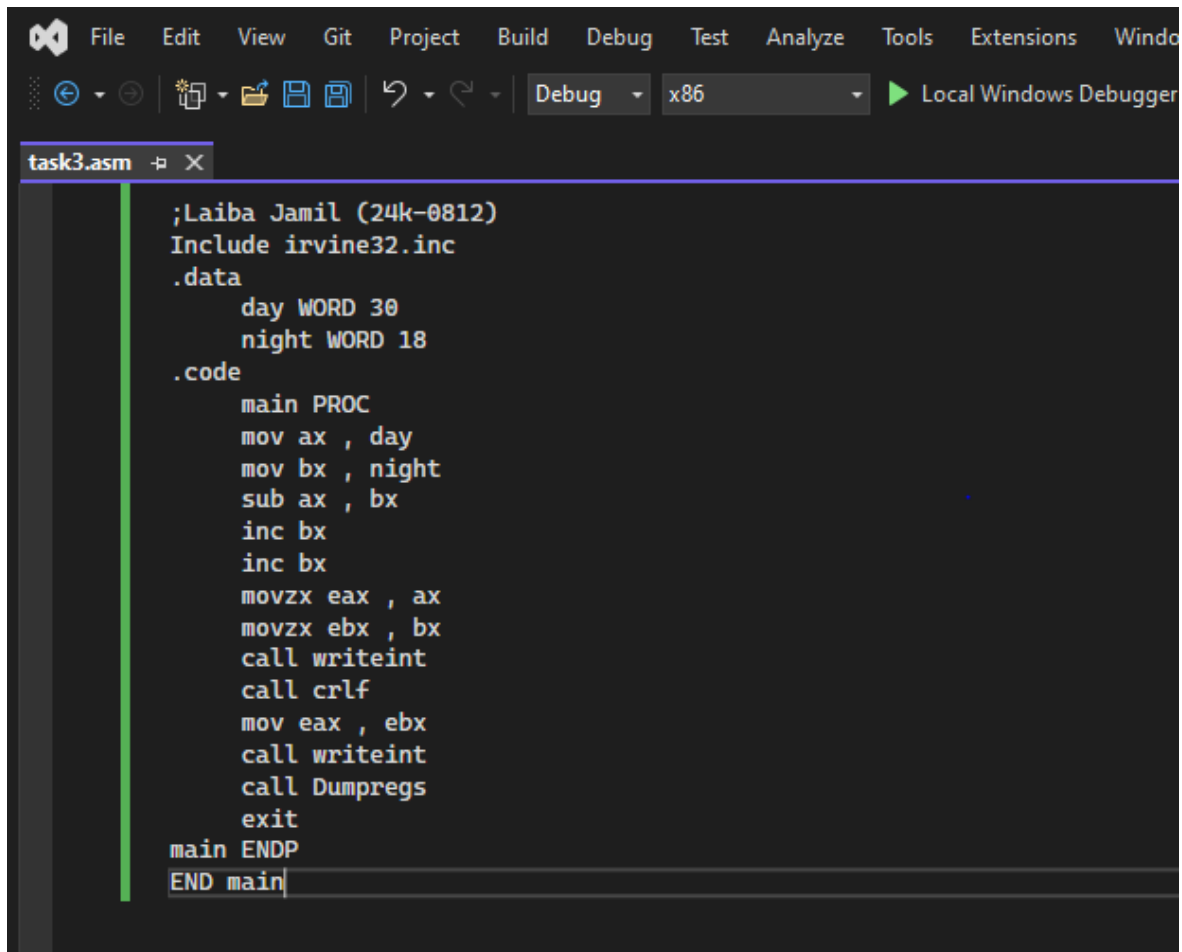
Task 2:


```asm
;Laiba Jamil (24k-0812)
Include irvine32.inc
.data
    balance DWORD 5000
    amount DWORD 1200
    amt DWORD 2000
.code
    main PROC
    mov eax , balance
    add eax , amount
    sub eax , amt
    call writeint
    call Dumpregs
    exit
main ENDP
END main
```
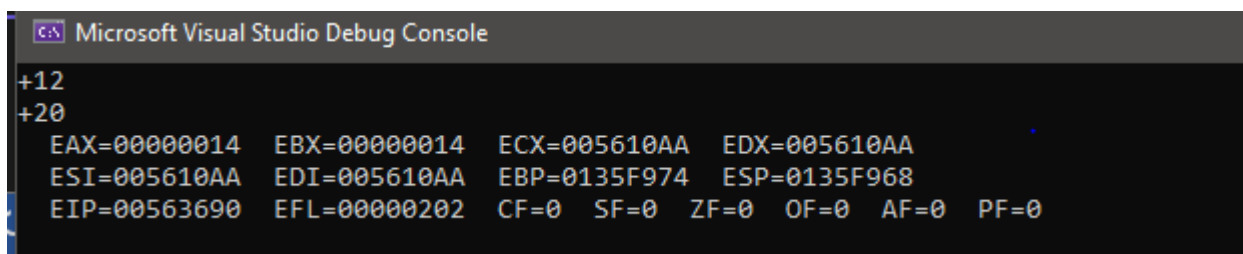


```
Microsoft Visual Studio Debug Console

+4200
  EAX=00001068  EBX=00A78000  ECX=001810AA  EDX=001810AA
  ESI=001810AA  EDI=001810AA  EBP=00CFF96C  ESP=00CFF960
  EIP=0018367B  EFL=00000202  CF=0  SF=0  ZF=0  OF=0  AF=0  PF=0
```
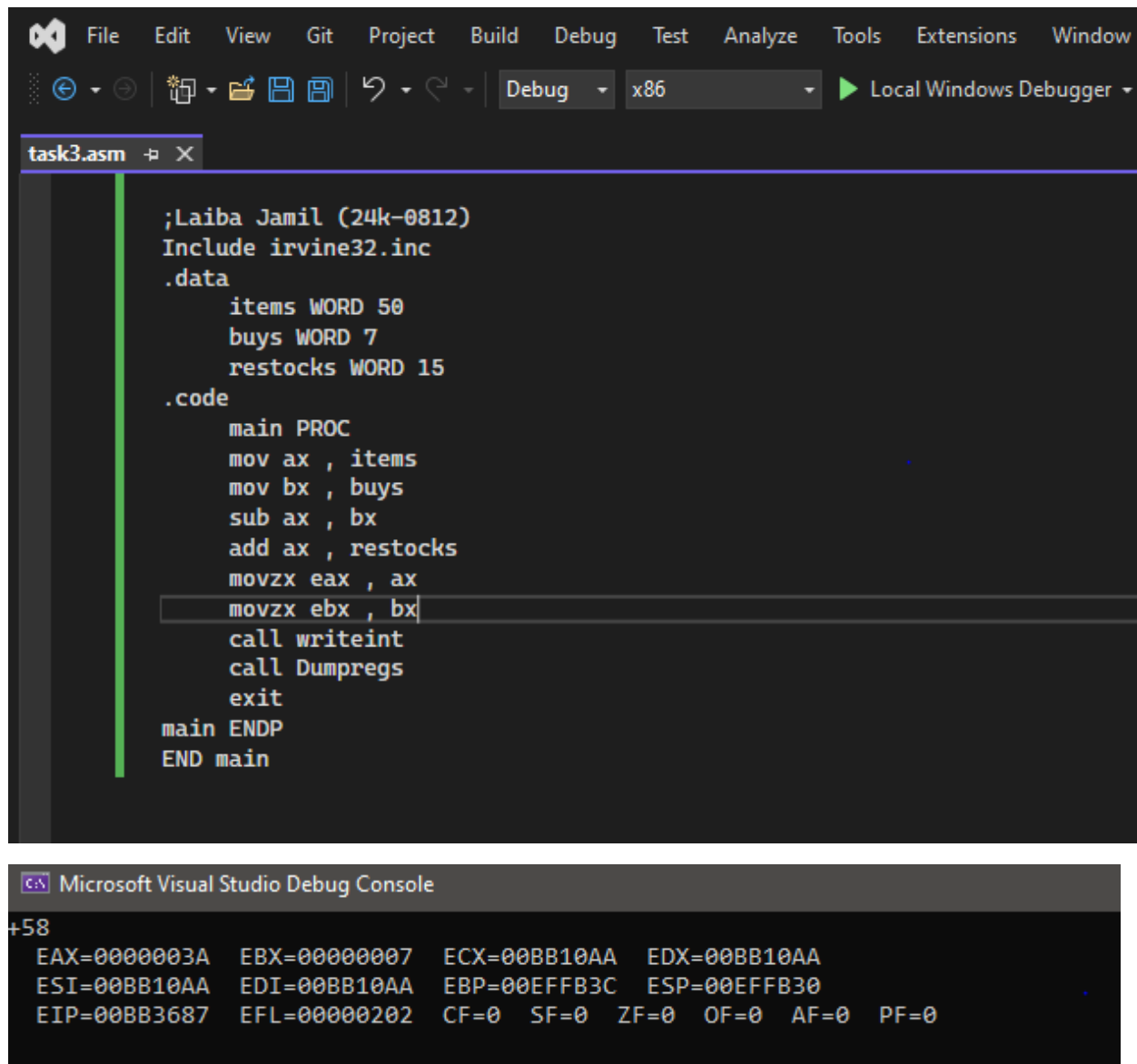
Task 3:


```asm
;Laiba Jamil (24k-0812)
Include irvine32.inc
.data
    day WORD 30
    night WORD 18
.code
    main PROC
    mov ax , day
    mov bx , night
    sub ax , bx
    inc bx
    inc bx
    movzx eax , ax
    movzx ebx , bx
    call writeint
    call crlf
    mov eax , ebx
    call writeint
    call Dumpregs
    exit
main ENDP
END main
```



```
Microsoft Visual Studio Debug Console

+12
+20
  EAX=00000014  EBX=00000014  ECX=005610AA  EDX=005610AA
  ESI=005610AA  EDI=005610AA  EBP=0135F974  ESP=0135F968
  EIP=00563690  EFL=00000202  CF=0  SF=0  ZF=0  OF=0  AF=0  PF=0
```
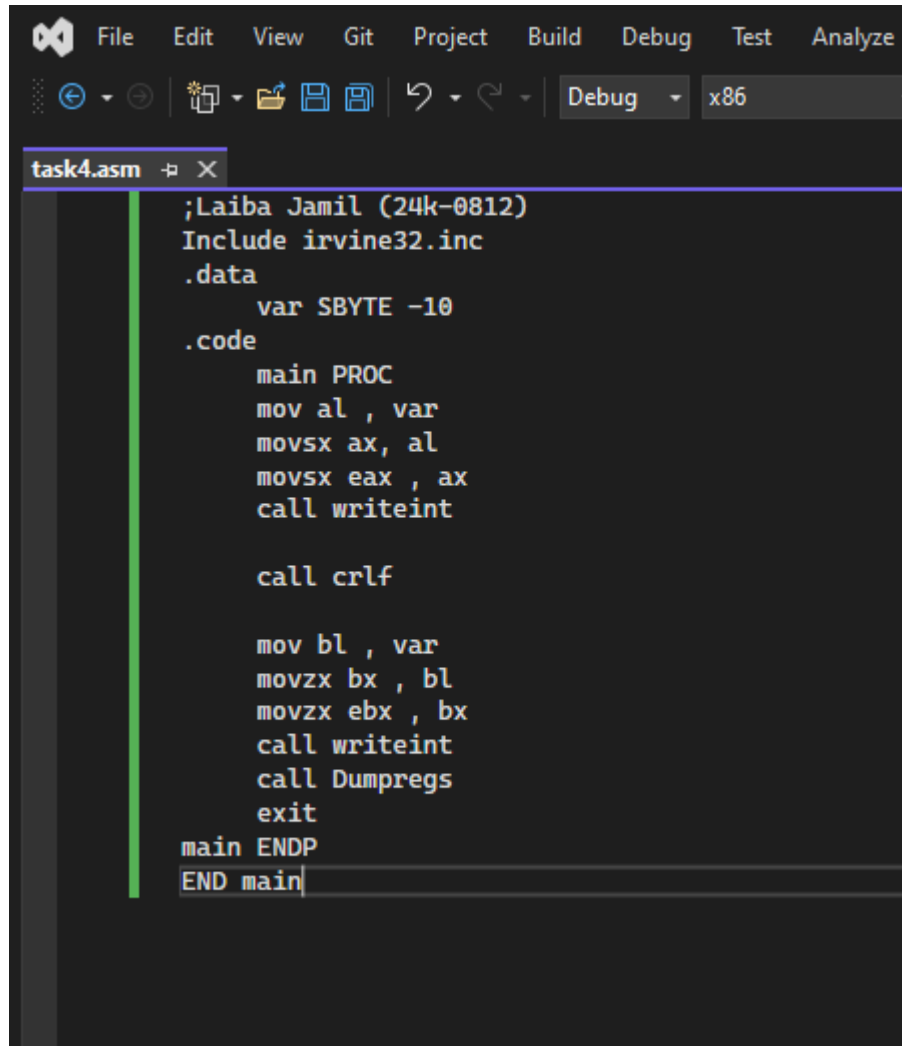
Task 4:

```asm
;Laiba Jamil (24k-0812)
Include irvine32.inc
.data
    items WORD 50
    buys WORD 7
    restocks WORD 15
.code
    main PROC
    mov ax , items
    mov bx , buys
    sub ax , bx
    add ax , restocks
    movzx eax , ax
    movzx ebx , bx
    call writeint
    call Dumpregs
    exit
main ENDP
END main
```

Microsoft Visual Studio Debug Console

```
+58
  EAX=0000003A   EBX=00000007   ECX=00BB10AA   EDX=00BB10AA
  ESI=00BB10AA   EDI=00BB10AA   EBP=00EFFB3C   ESP=00EFFB30
  EIP=00BB3687   EFL=00000202   CF=0   SF=0   ZF=0   OF=0   AF=0   PF=0
```
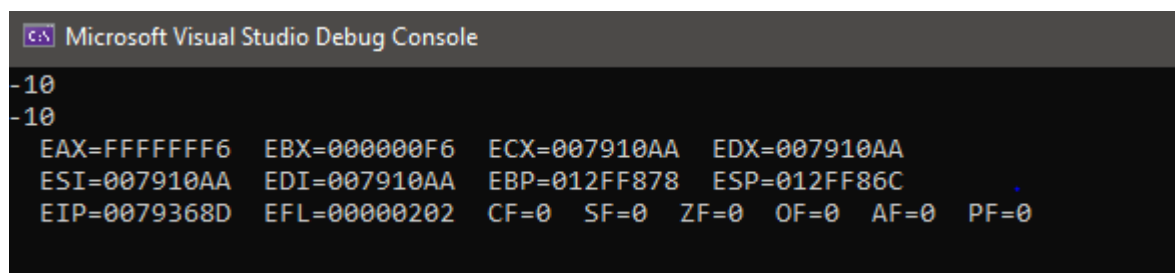
Task 5:


```asm
;Laiba Jamil (24k-0812)
Include irvine32.inc
.data
    var SBYTE -10
.code
    main PROC
    mov al , var
    movsx ax, al
    movsx eax , ax
    call writeint

    call crlf

    mov bl , var
    movzx bx , bl
    movzx ebx , bx
    call writeint
    call Dumpregs
    exit
main ENDP
END main
```
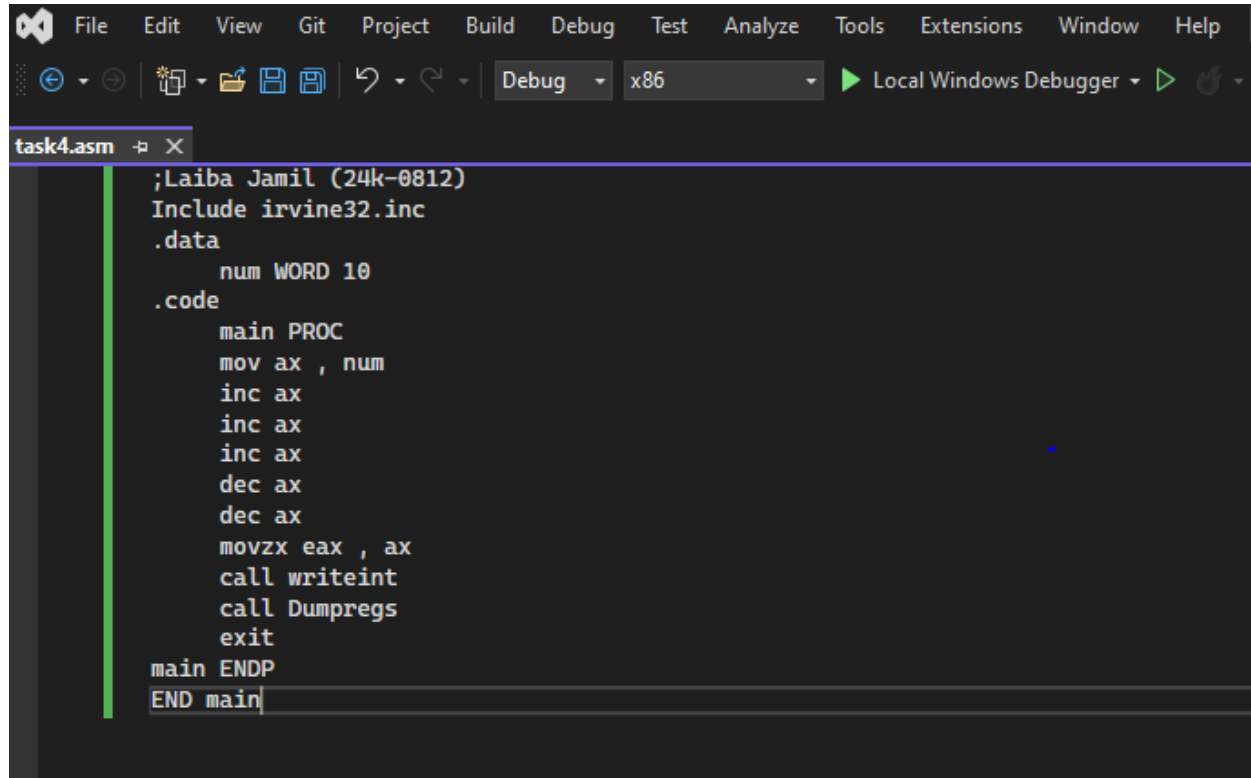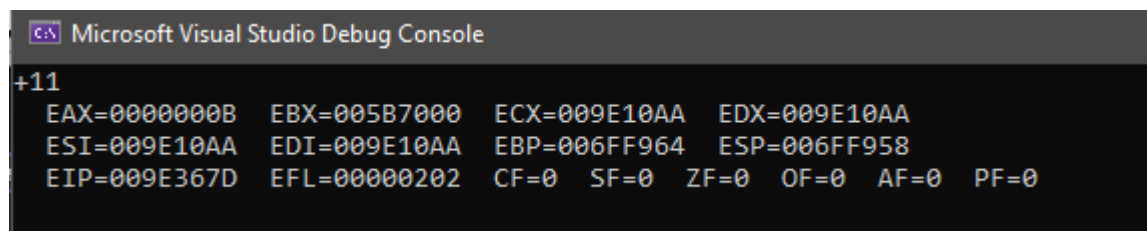
```
Microsoft Visual Studio Debug Console
-10
-10
 EAX=FFFFFFF6  EBX=000000F6  ECX=007910AA  EDX=007910AA
 ESI=007910AA  EDI=007910AA  EBP=012FF878  ESP=012FF86C
 EIP=0079368D  EFL=00000202  CF=0  SF=0  ZF=0  OF=0  AF=0  PF=0
```

Task 6:


```asm
;Laiba Jamil (24k-0812)
Include irvine32.inc
.data
    num WORD 10
.code
    main PROC
    mov ax , num
    inc ax
    inc ax
    inc ax
    dec ax
    dec ax
    movzx eax , ax
    call writeint
    call Dumpregs
    exit
main ENDP
END main
```



```
+11
  EAX=0000000B  EBX=005B7000  ECX=009E10AA  EDX=009E10AA
  ESI=009E10AA  EDI=009E10AA  EBP=006FF964  ESP=006FF958
  EIP=009E367D  EFL=00000202  CF=0  SF=0  ZF=0  OF=0  AF=0  PF=0
```

Task 7:
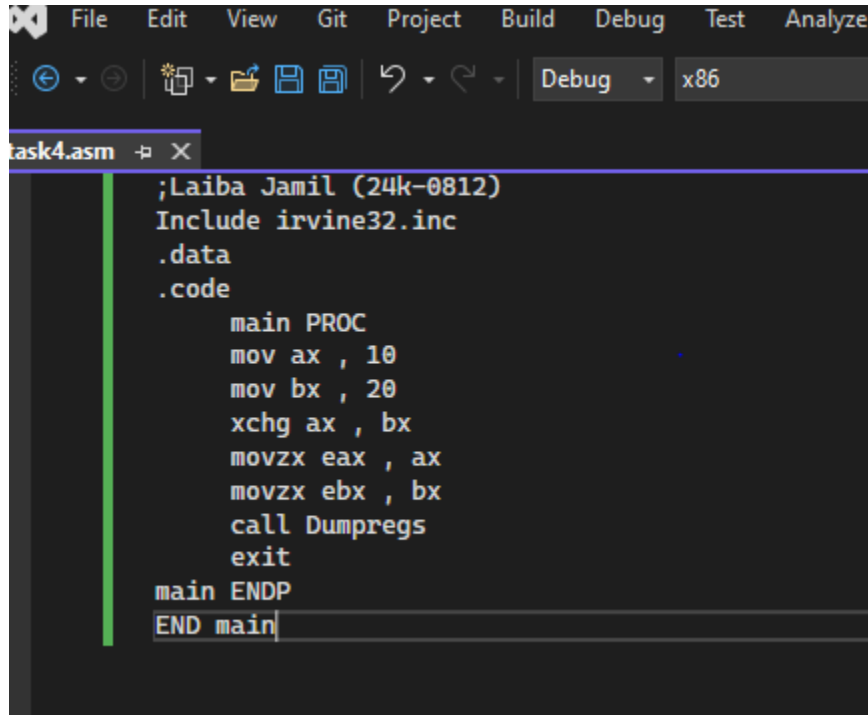
```asm
;Laiba Jamil (24k-0812)
Include irvine32.inc
        PI = 3
.data
    num WORD 4
.code
    main PROC
    mov eax , PI
    movzx ebx , num
    imul eax , ebx
    call writeint
    call Dumpregs
    exit
main ENDP
END main
```
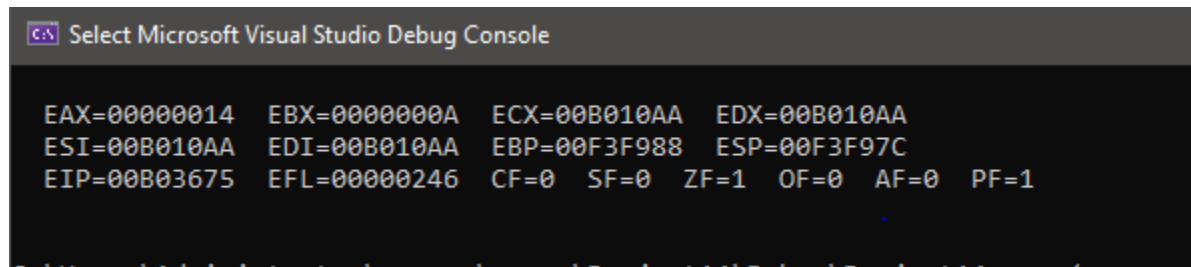
Microsoft Visual Studio Debug Console
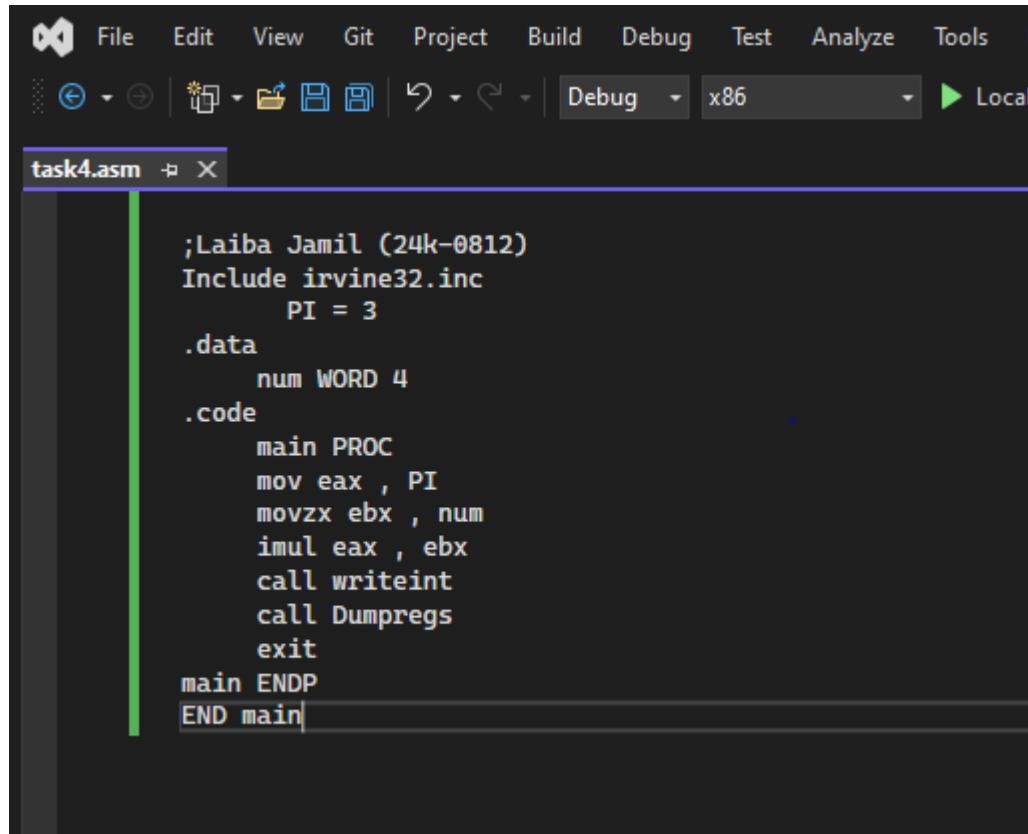
```
+12
  EAX=0000000C  EBX=00000004  ECX=001F10AA  EDX=001F10AA
  ESI=001F10AA  EDI=001F10AA  EBP=00AFFEB4  ESP=00AFFEA8
  EIP=001F3679  EFL=00000202  CF=0  SF=0  ZF=0  OF=0  AF=0  PF=0
```

Task 8:
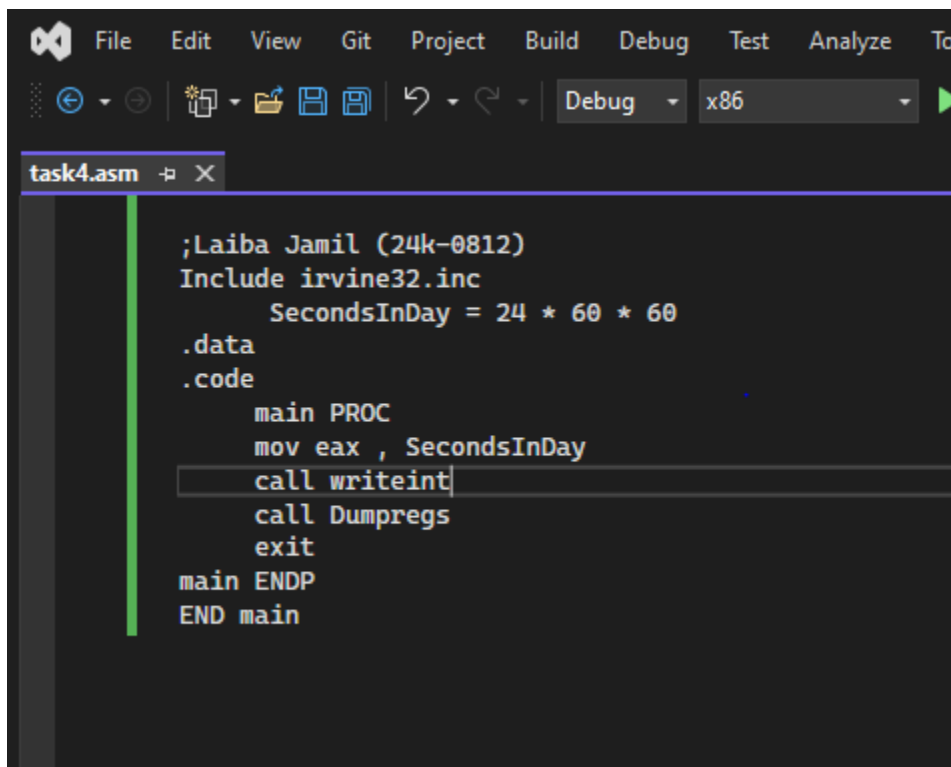

```asm
;Laiba Jamil (24k-0812)
Include irvine32.inc
.data
.code
    main PROC
    mov ax , 10
    mov bx , 20
    xchg ax , bx
    movzx eax , ax
    movzx ebx , bx
    call Dumpregs
    exit
main ENDP
END main
```
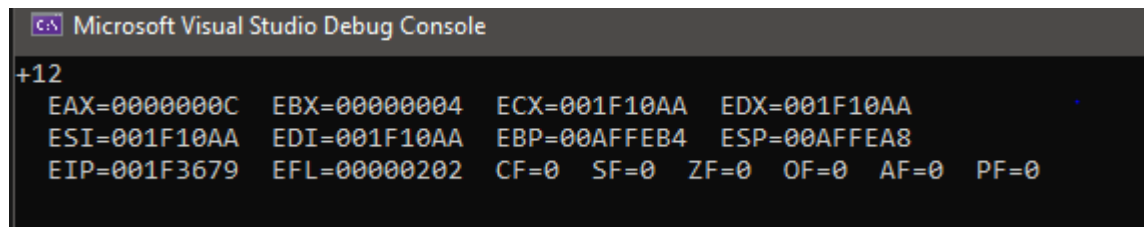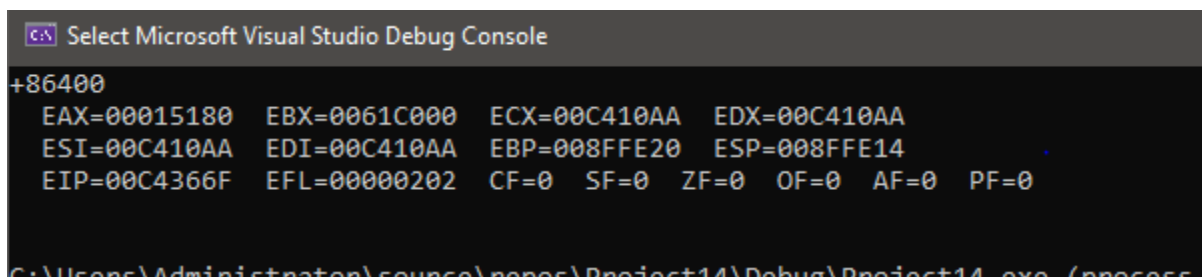


```
Select Microsoft Visual Studio Debug Console

 EAX=00000014   EBX=0000000A   ECX=00B010AA   EDX=00B010AA
 ESI=00B010AA   EDI=00B010AA   EBP=00F3F988   ESP=00F3F97C
 EIP=00B03675   EFL=00000246   CF=0  SF=0  ZF=1  OF=0  AF=0  PF=1
```

Task 9:

Debug   x86

task4.asm

```
;Laiba Jamil (24k-0812)
Include irvine32.inc
        SecondsInDay = 24 * 60 * 60
.data
.code
    main PROC
    mov eax , SecondsInDay
    call writeint
    call Dumpregs
    exit
main ENDP
END main
```
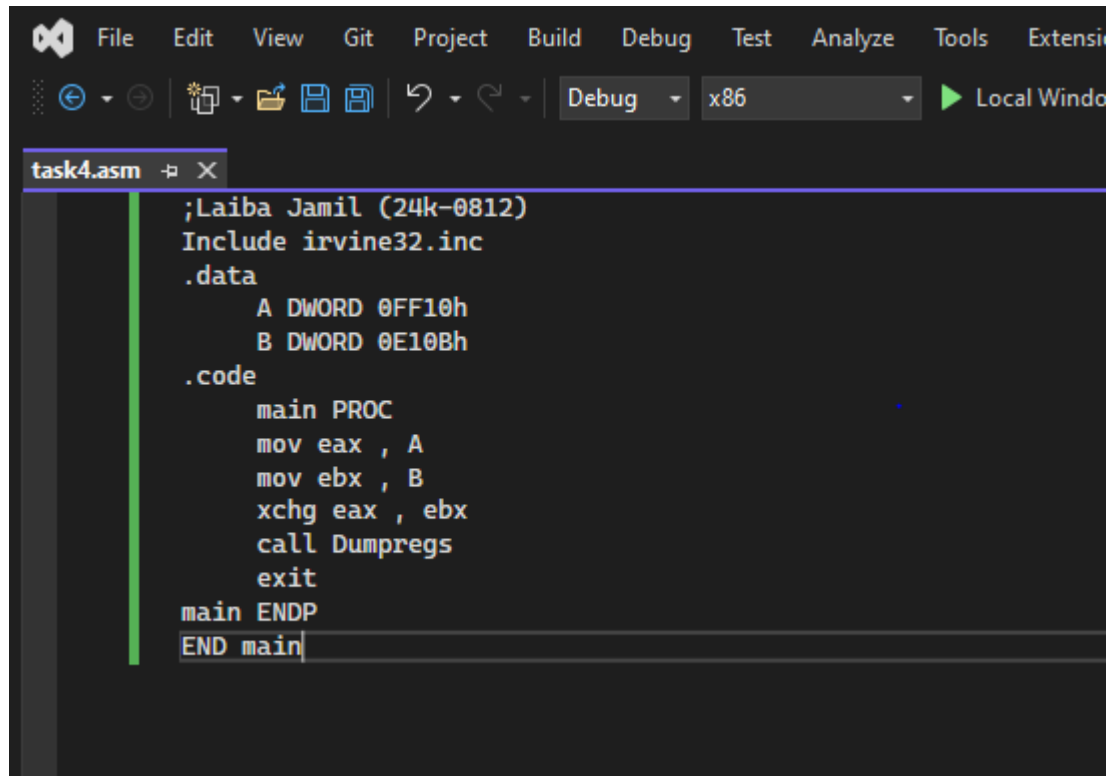
Select Microsoft Visual Studio Debug Console
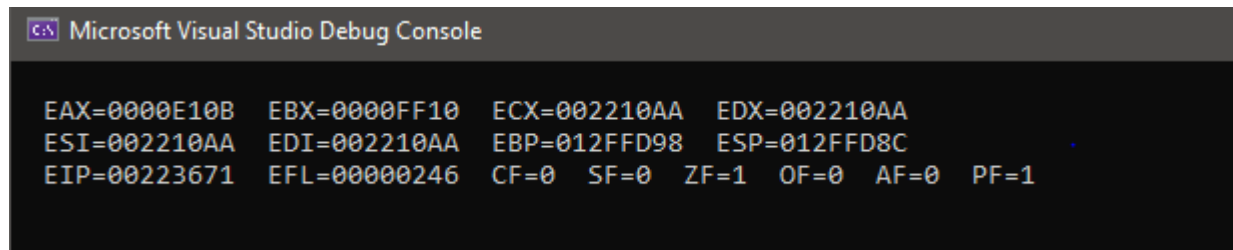
```
+86400
 EAX=00015180   EBX=0061C000   ECX=00C410AA   EDX=00C410AA
 ESI=00C410AA   EDI=00C410AA   EBP=008FFE20   ESP=008FFE14
 EIP=00C4366F   EFL=00000202   CF=0  SF=0  ZF=0  OF=0  AF=0  PF=0

C:\Users\Administrator\source\repos\Project14\Debug\Project14.exe (process
```

Task 10:

```asm
;Laiba Jamil (24k-0812)
Include irvine32.inc
.data
    A DWORD 0FF10h
    B DWORD 0E10Bh
.code
    main PROC
    mov eax , A
    mov ebx , B
    xchg eax , ebx
    call Dumpregs
    exit
main ENDP
END main
```

Microsoft Visual Studio Debug Console

```
EAX=0000E10B   EBX=0000FF10   ECX=002210AA   EDX=002210AA
ESI=002210AA   EDI=002210AA   EBP=012FFD98   ESP=012FFD8C
EIP=00223671   EFL=00000246   CF=0   SF=0   ZF=1   OF=0   AF=0   PF=1
```

Task 11:

i)


```asm
;Laiba Jamil (24k-0812)
Include irvine32.inc
.data
    val1 BYTE 10h
    val2 WORD 8000h
    val3 DWORD 0FFFFh
    val4 WORD 7FFFh

    msg1 BYTE "After incrementing val2: " ,0
    msg2 BYTE "After subtracting val3 from EAX:     " ,0
    msg3 BYTE "After subtracting val4 from val2:    " ,0
    msg4 BYTE "Value of BL after moving val1:       " ,0
.code
    main PROC
    mov ax , val2
    inc ax
    movzx eax , ax
    mov edx , OFFSET msg1
    call WriteString
    call writehex            ; printing in hexadecimal after msg
    call crlf                ;next line
    mov edx , OFFSET msg1
    call WriteString
    call writeint            ;printing in decimal after msg
    call Dumpregs
    exit
main ENDP
END main
```



```
Microsoft Visual Studio Debug Console
After incrementing val2: 00008001
After incrementing val2: +32769
  EAX=00008001  EBX=003B1000  ECX=001110AA  EDX=00116009
  ESI=001110AA  EDI=001110AA  EBP=0053FADC  ESP=0053FAD0
  EIP=00113693  EFL=00000202  CF=0  SF=0  ZF=0  OF=0  AF=0  PF=0
```
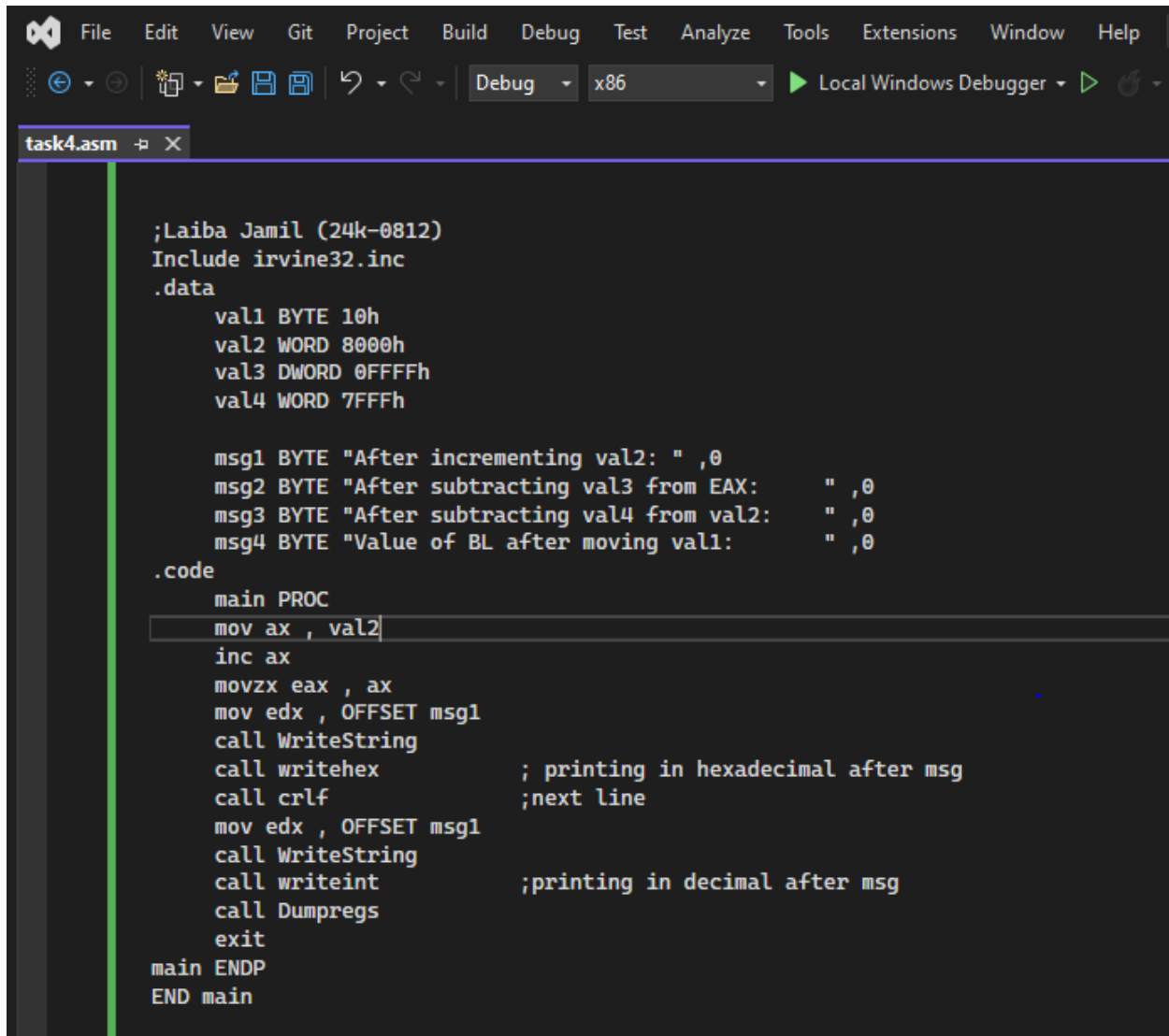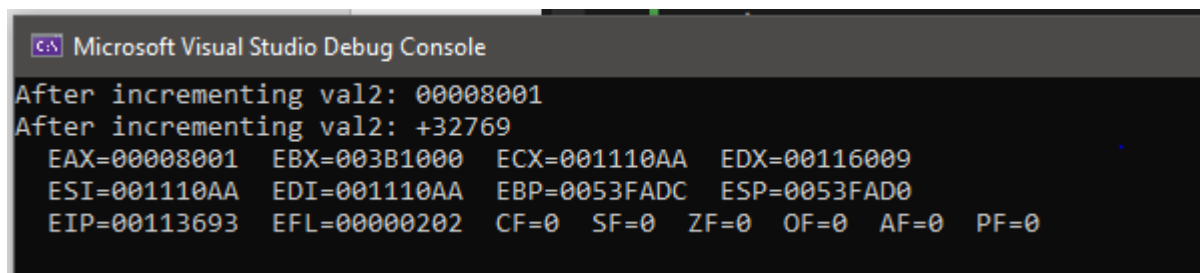
ii)

```asm
;Laiba Jamil (24k-0812)
Include irvine32.inc
.data
    val1 BYTE 10h
    val2 WORD 8000h
    val3 DWORD 0FFFFh
    val4 WORD 7FFFh

    msg1 BYTE "After incrementing val2: " ,0
    msg2 BYTE "After subtracting val3 from EAX: " ,0
    msg3 BYTE "After subtracting val4 from val2:    " ,0
    msg4 BYTE "Value of BL after moving val1:       " ,0
.code
    main PROC
    mov ebx , val3
    sub eax ,   ebx             ; subtracting val3 from whatever is in EAX
    mov edx , OFFSET msg2
    call WriteString            ; printing in hexadecimal after msg
    call writehex

    call crlf                   ;for new line
    mov edx , OFFSET msg2
    call writestring
    call writeint               ; printing in decimal after msg
    call Dumpregs
    exit
main ENDP
END main
```
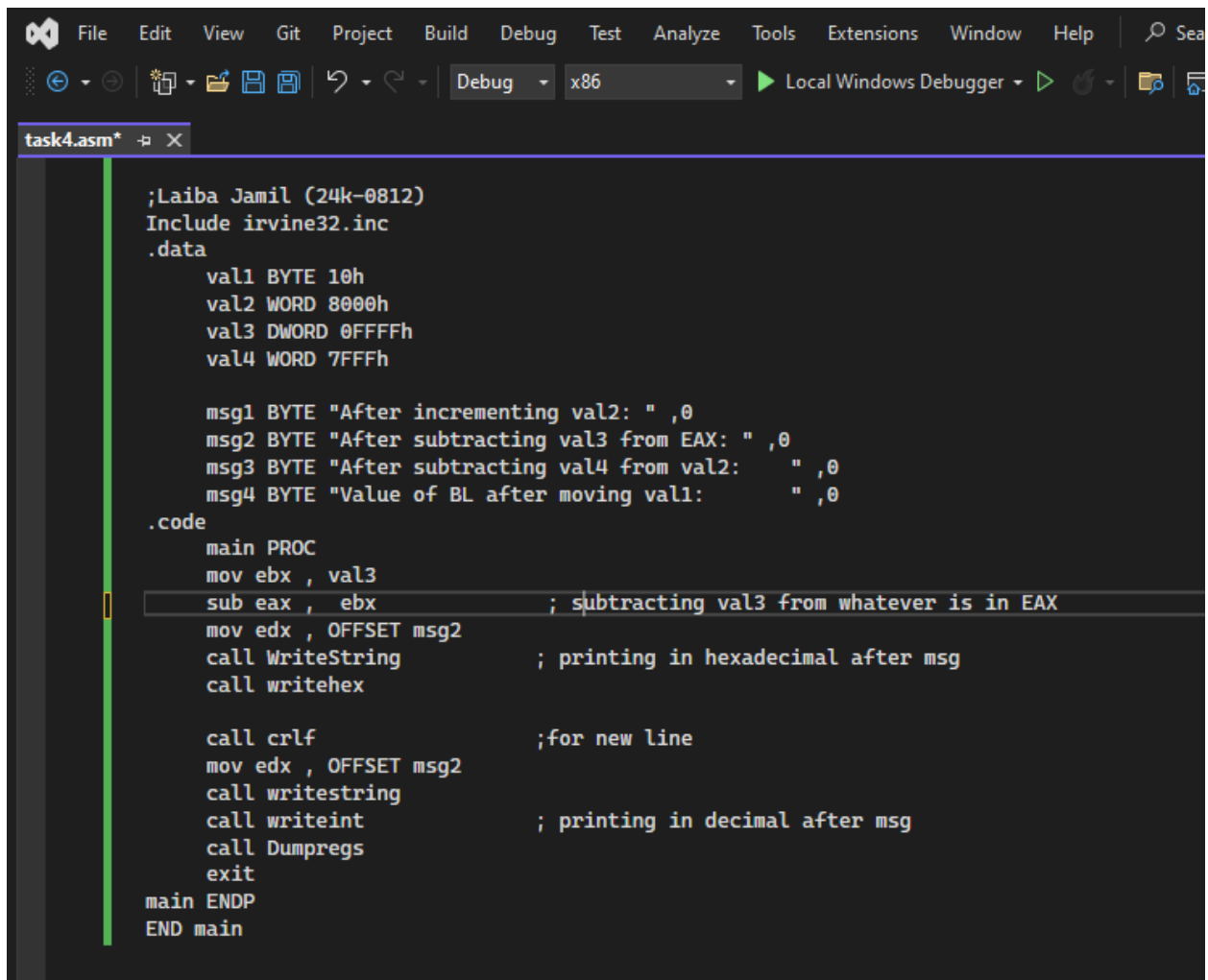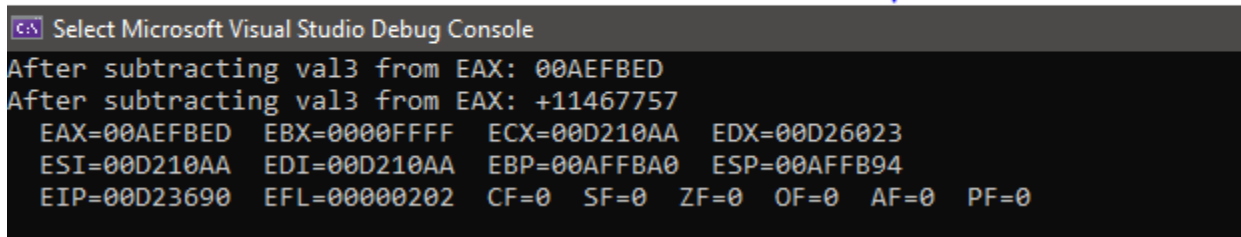
Select Microsoft Visual Studio Debug Console

```
After subtracting val3 from EAX: 00AEFBED
After subtracting val3 from EAX: +11467757
 EAX=00AEFBED  EBX=0000FFFF  ECX=00D210AA  EDX=00D26023
 ESI=00D210AA  EDI=00D210AA  EBP=00AFFBA0  ESP=00AFFB94
 EIP=00D23690  EFL=00000202  CF=0  SF=0  ZF=0  OF=0  AF=0  PF=0
```

iii)

```asm
;Laiba Jamil (24k-0812)
Include irvine32.inc
.data
    val1 BYTE 10h
    val2 WORD 8000h
    val3 DWORD 0FFFFh
    val4 WORD 7FFFh

    msg1 BYTE "After incrementing val2: " ,0
    msg2 BYTE "After subtracting val3 from EAX: " ,0
    msg3 BYTE "After subtracting val4 from val2: " ,0
    msg4 BYTE "Value of BL after moving val1:      " ,0
.code
    main PROC
    mov ax , val2
    mov bx , val4
    movzx eax , ax
    movzx ebx , bx
    sub eax , ebx
    mov edx , OFFSET msg3
    call Writestring
    call writehex                    ; printing in hexadecimal after msg

    call crlf                        ; for newline
    mov edx , OFFSET msg3
    call Writestring
    call writeint                    ;printing in decimal after msg
    call Dumpregs
    exit
main ENDP
END main
```
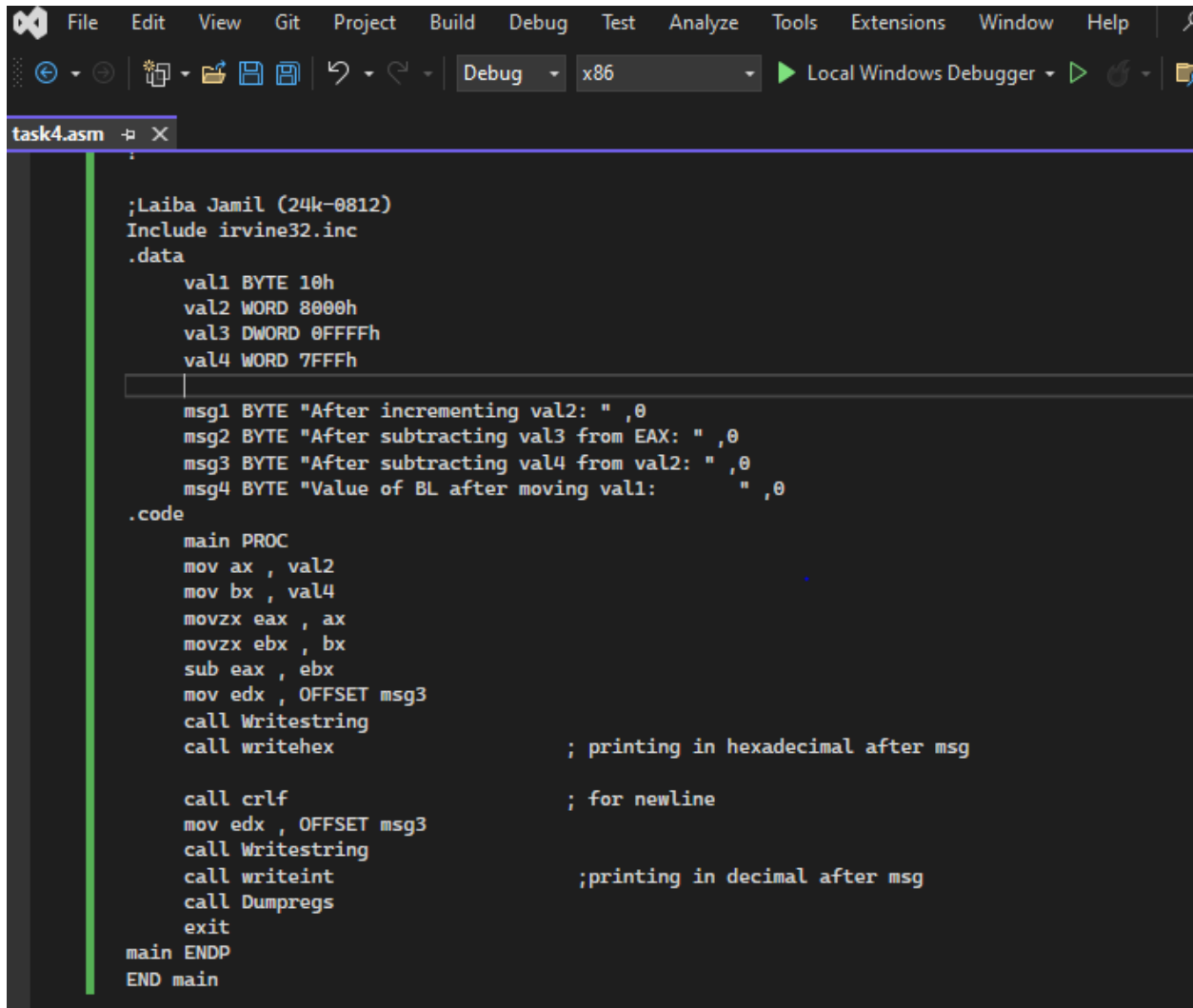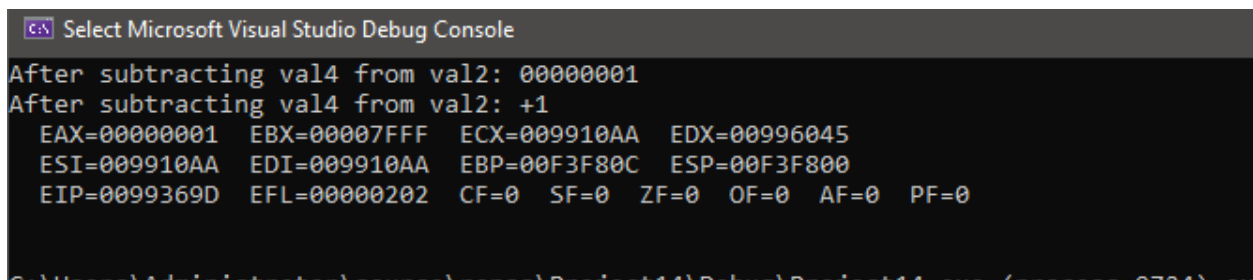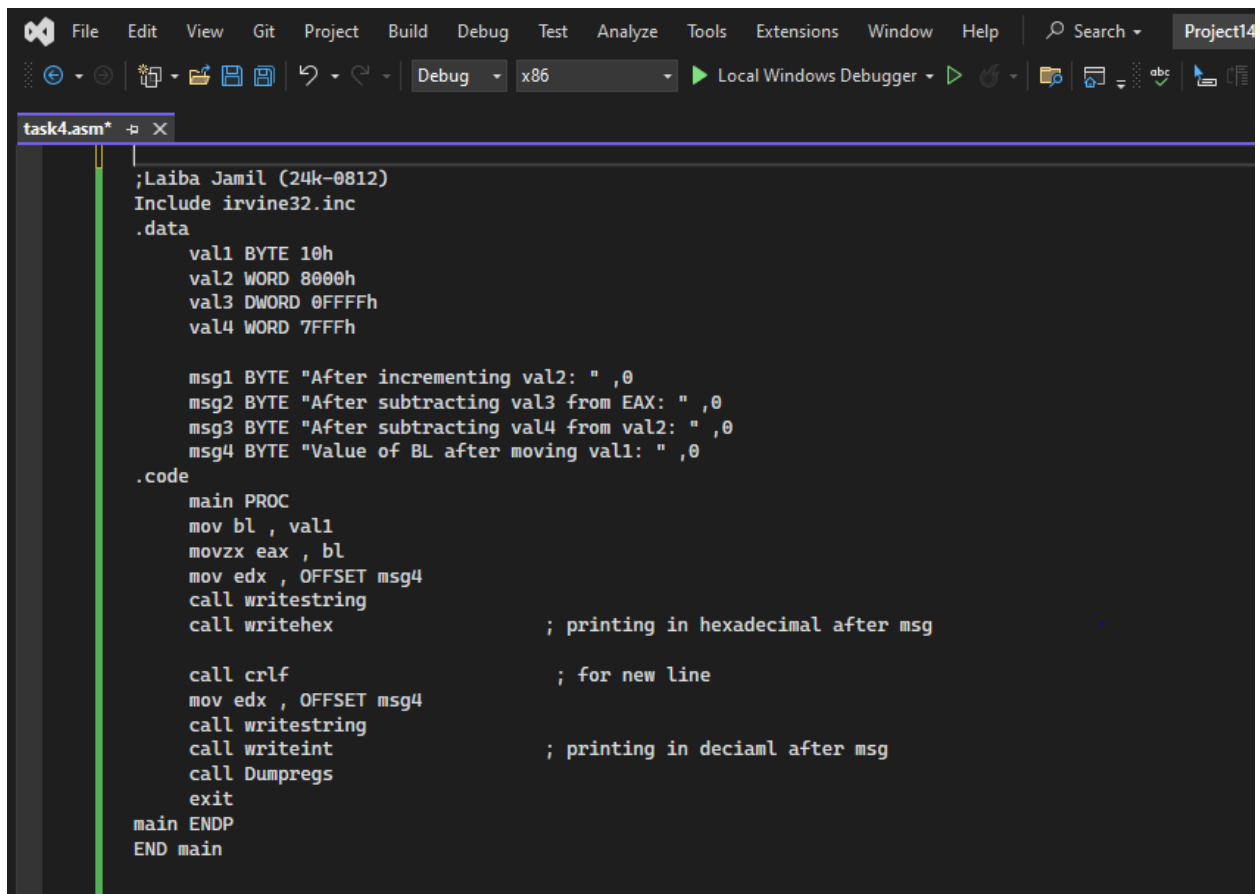
Select Microsoft Visual Studio Debug Console

```
After subtracting val4 from val2: 00000001
After subtracting val4 from val2: +1
  EAX=00000001  EBX=00007FFF  ECX=009910AA  EDX=00996045
  ESI=009910AA  EDI=009910AA  EBP=00F3F80C  ESP=00F3F800
  EIP=0099369D  EFL=00000202  CF=0  SF=0  ZF=0  OF=0  AF=0  PF=0
```
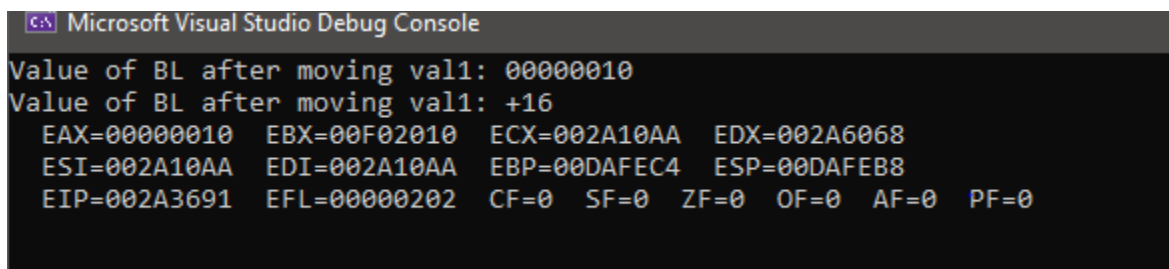
iv)

```asm
;Laiba Jamil (24k-0812)
Include irvine32.inc
.data
    val1 BYTE 10h
    val2 WORD 8000h
    val3 DWORD 0FFFFh
    val4 WORD 7FFFh

    msg1 BYTE "After incrementing val2: " ,0
    msg2 BYTE "After subtracting val3 from EAX: " ,0
    msg3 BYTE "After subtracting val4 from val2: " ,0
    msg4 BYTE "Value of BL after moving val1: " ,0
.code
    main PROC
    mov bl , val1
    movzx eax , bl
    mov edx , OFFSET msg4
    call writestring
    call writehex                ; printing in hexadecimal after msg

    call crlf                    ; for new line
    mov edx , OFFSET msg4
    call writestring
    call writeint                ; printing in deciaml after msg
    call Dumpregs
    exit
main ENDP
END main
```

```
Microsoft Visual Studio Debug Console
Value of BL after moving val1: 00000010
Value of BL after moving val1: +16
  EAX=00000010  EBX=00F02010  ECX=002A10AA  EDX=002A6068
  ESI=002A10AA  EDI=002A10AA  EBP=00DAFEC4  ESP=00DAFEB8
  EIP=002A3691  EFL=00000202  CF=0  SF=0  ZF=0  OF=0  AF=0  PF=0
```