

## COAL LAB 2

### Questions:

1. Implement all of these equations in assembly language.

- $47 + 39 + 60 + 85 + 64 + 540 - 0Ah$
- $30 - 9 + 186 - 150$
- $101110 + 50Ah + 6710d + 1010001 + F$
- $10001101 - D83h + 385 + 10 + 1111101 - E + F$

2. Write a program in assembly language that implements following expression:

- $edx = eax + 1 + ebx - ecx + 0Ah - 650 + 73d$
- $eax = 5ADh - ebx + 650 + 65d - 11110111 + 150$
- $ebx = 5ADh - eax + 65d + 730 - 11100101 + 7Bh$
- $ecx = 110010101101b + 45h - 730 + ebx - ecx + 1$

### Exercise 1

1)  $47 + 39 + 60 + 85 + 64 + 540 - 0Ah$

```
1  INCLUDE Irvine32.inc
2  .code
3  main PROC
4      mov eax, 47d
5      mov ebx, 39d
6      mov ecx, 60d
7      mov edx, 540
8      add eax, ebx
9      add eax, ecx
10     add eax, edx
11     add eax, 85d
12     add eax, 64d
13     sub eax, 0Ah
14     call writedec
15     call crlf
16     call DumpRegs
17     exit
18 main ENDP
19 END main
```

Output

```
Show output from: Build
Build started...
1>----- Build started: Project: Lab_02, Configuration: Debug Win32 -----
1>Assembling Test.asm...
1>Lab_02.vcxproj -> C:\Users\anas\source\repos\Lab_02\Debug\Lab_02.exe
***** Build: 1 succeeded, 0 failed, 0 up-to-date, 0 skipped *****
```

Build succeeded

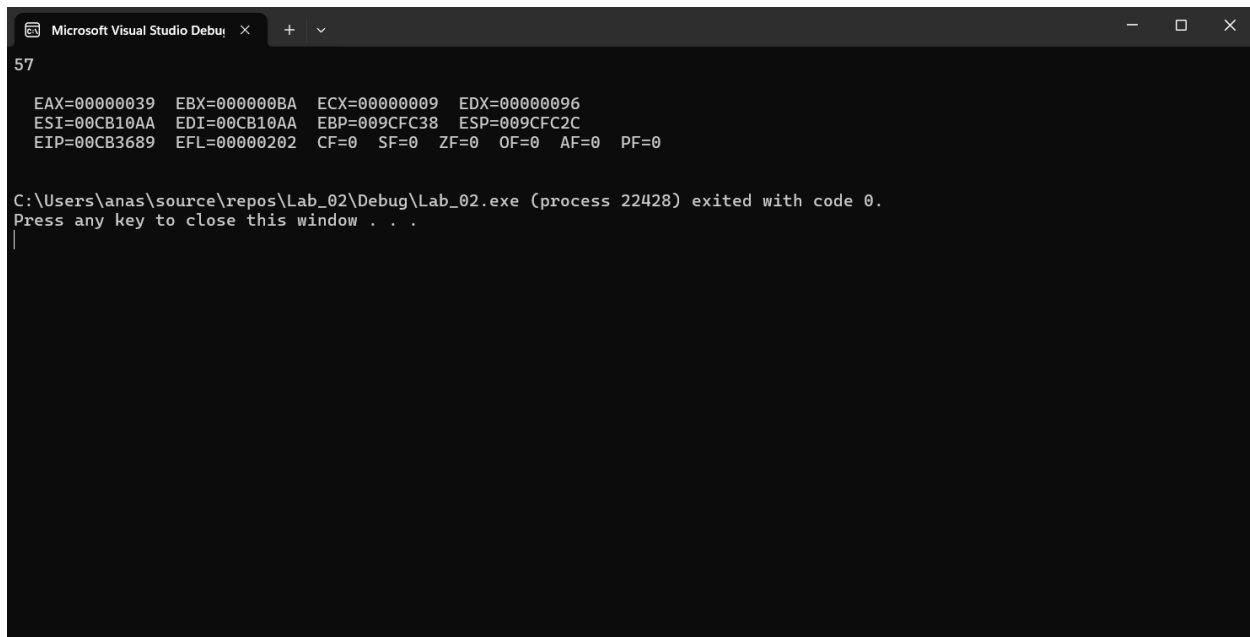
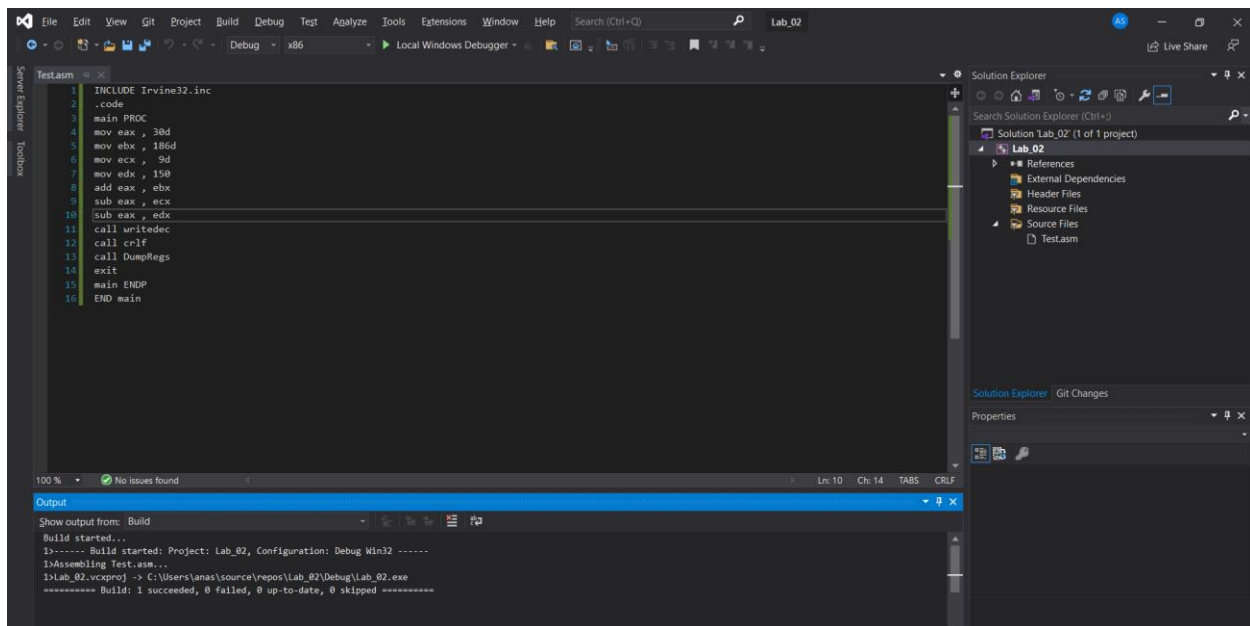
```
Microsoft Visual Studio Debug Console
329
EAX=00000149 EBX=00000027 ECX=0000003C EDX=0000002C
ESI=00A210AA EDI=00A210AA EBP=00FDF894 ESP=00FDF888
EIP=00A23692 EFL=00000202 CF=0 SF=0 ZF=0 OF=0 AF=0 PF=0

C:\Users\anas\source\repos\Lab_02\Debug\Lab_02.exe (process 18484) exited with code 0.
Press any key to close this window . . .
```

Code:

```
INCLUDE Irvine32.inc
.code
main PROC
mov eax , 47d
mov ebx , 39d
mov ecx , 60d
mov edx , 54o
add eax , ebx
add eax , ecx
add eax , edx
add eax , 85d
add eax , 64d
sub eax , 0Ah
call writedec
call crlf
call DumpRegs
exit
main ENDP
END main
```

2)  $30 - 9 + 186 - 150$

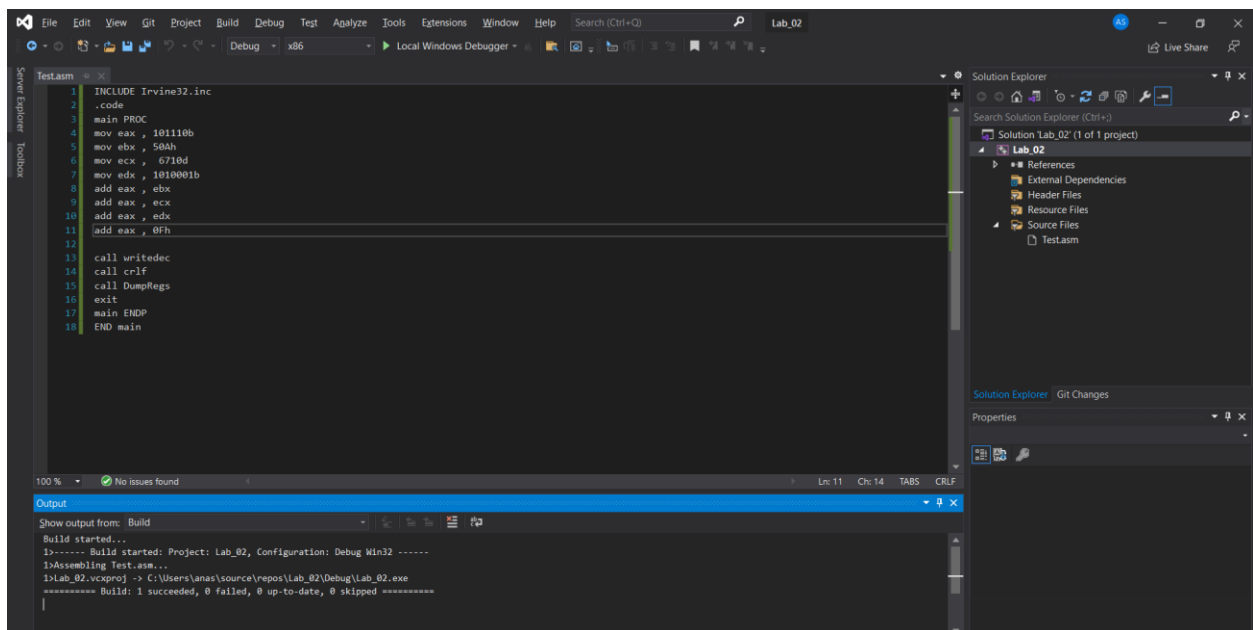


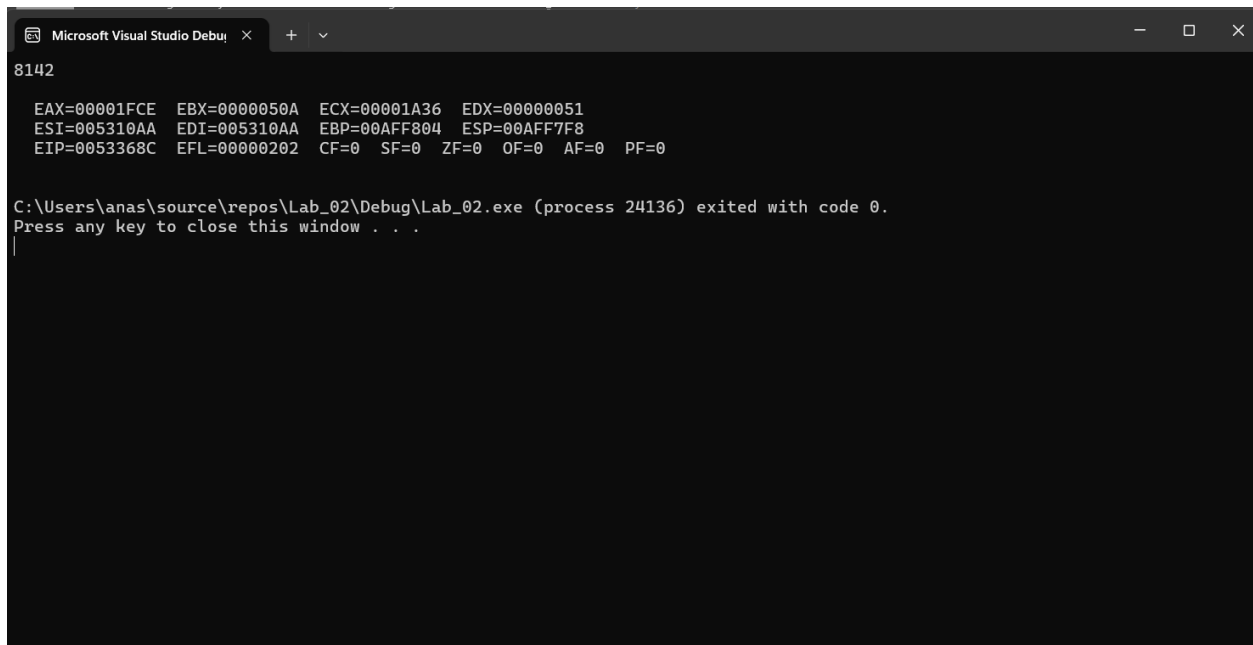
Code:

```
INCLUDE Irvine32.inc
.code
main PROC
mov eax, 30d
mov ebx, 186d
mov ecx, 9d
mov edx, 150
add eax, ebx
sub eax, ecx
sub eax, edx
call writedec
call crlf
```

```
call DumpRegs
exit
main ENDP
END main
```

3)  $101110 + 50Ah + 6710d + 1010001 + F$



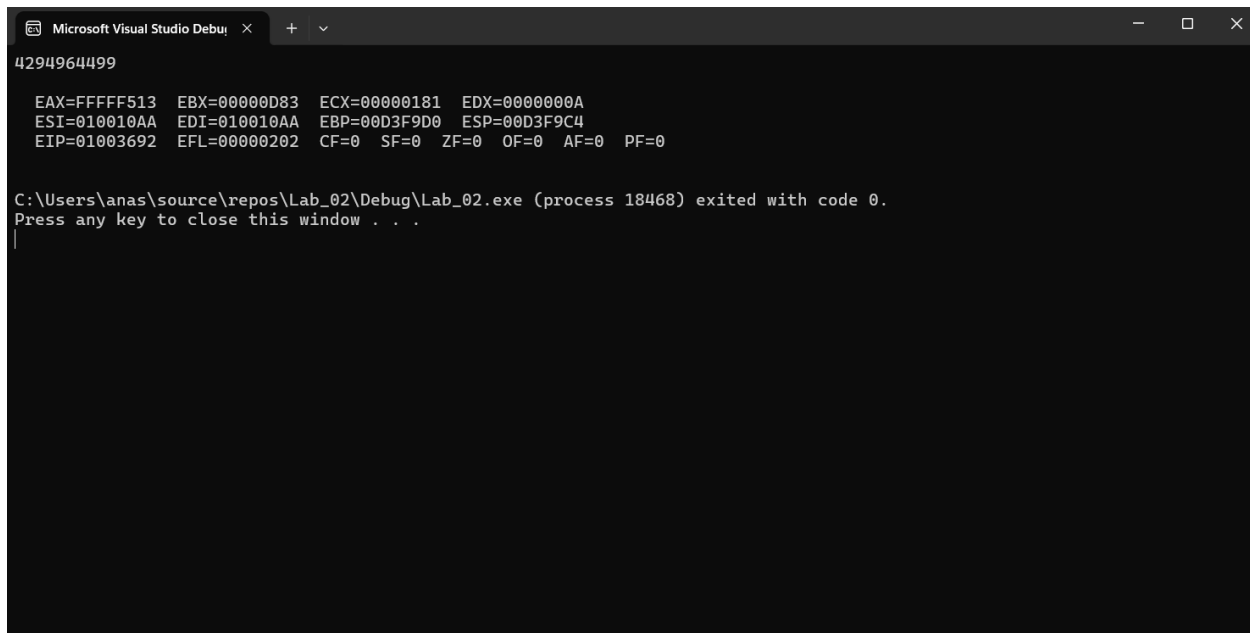
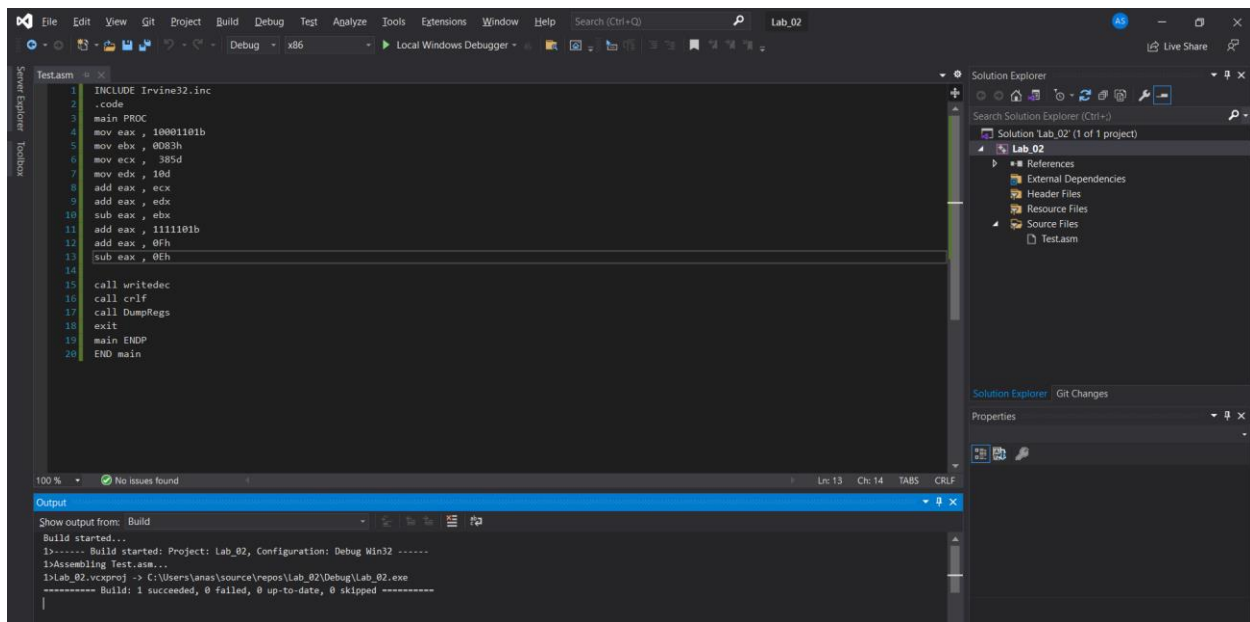


Code:

```
INCLUDE Irvine32.inc
.code
main PROC
    mov eax, 101110b
    mov ebx, 50Ah
    mov ecx, 6710d
    mov edx, 1010001b
    add eax, ebx
    add eax, ecx
    add eax, edx
    add eax, 0Fh

    call writedec
    call crlf
    call DumpRegs
    exit
main ENDP
END main
```

4)  $10001101 - D83h + 385 + 10 + 1111101 - E + F$



Code:

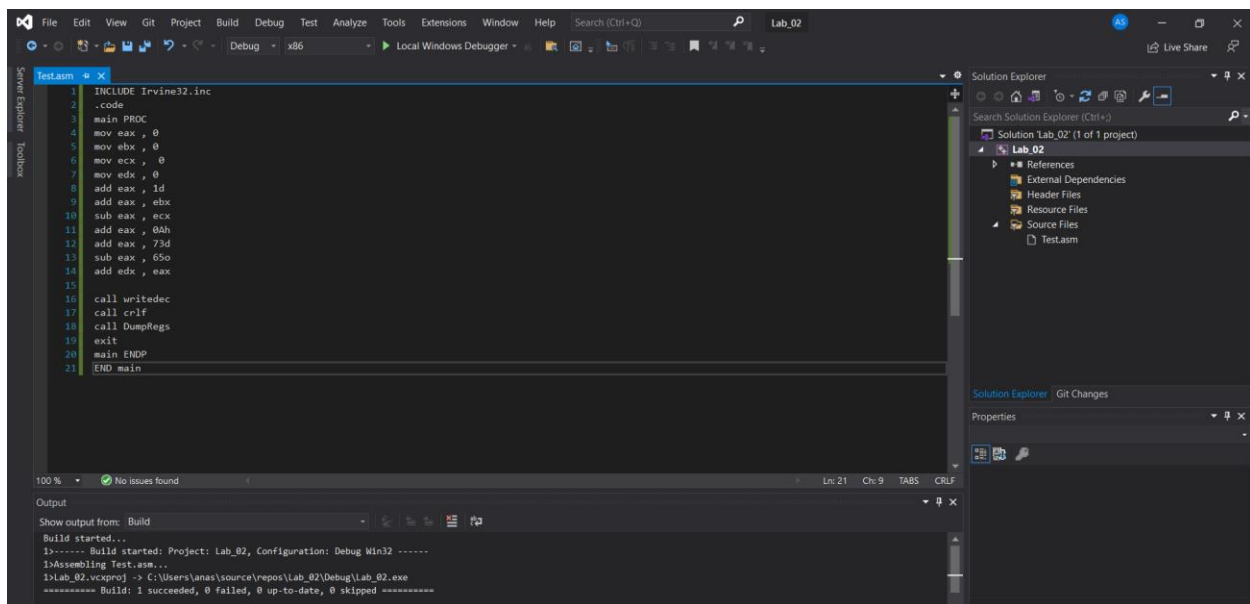
```
INCLUDE Irvine32.inc
.code
main PROC
mov eax, 10001101b
mov ebx, 0D83h
mov ecx, 385d
mov edx, 10d
add eax, ecx
add eax, edx
sub eax, ebx
add eax, 1111101b
add eax, 0Fh
```

```
sub eax , 0Eh
```

```
call writedec  
call crlf  
call DumpRegs  
exit  
main ENDP  
END main
```

## Exercise 2

1)  $edx = eax + 1 + ebx - ecx + 0Ah - 650 + 73d$



```
Microsoft Visual Studio Debug
31
EAX=0000001F  EBX=00000000  ECX=00000000  EDX=0000001F
ESI=005A10AA  EDI=005A10AA  EBP=00BFFE40  ESP=00BFFE34
EIP=005A3695  EFL=00000202  CF=0  SF=0  ZF=0  OF=0  AF=0  PF=0

C:\Users\anas\source\repos\Lab_02\Debug\Lab_02.exe (process 14608) exited with code 0.
Press any key to close this window . . .
```

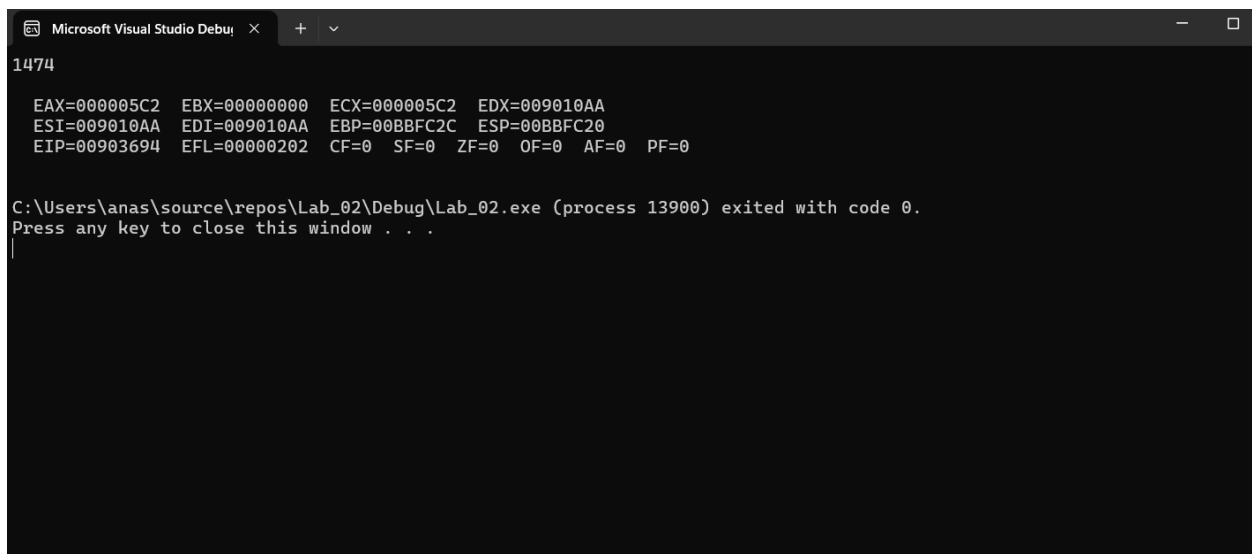
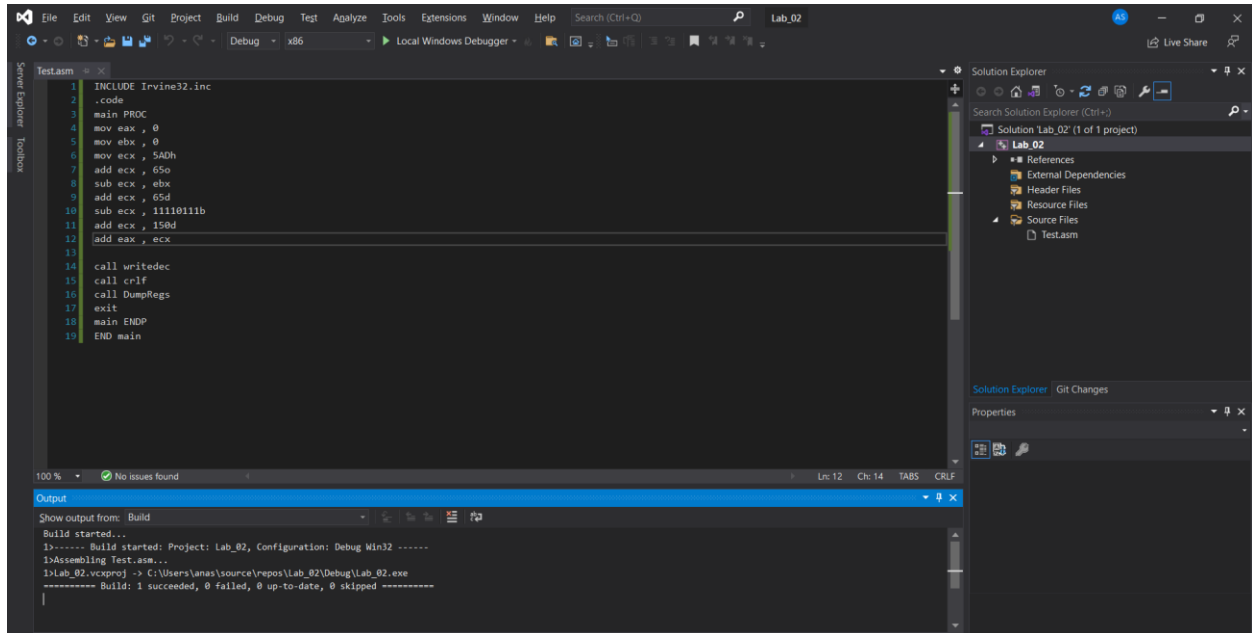
Code:

```
INCLUDE Irvine32.inc
.code
main PROC
    mov eax , 0
    mov ebx , 0
    mov ecx , 0
    mov edx , 0
    add eax , 1d
    add eax , ebx
    sub eax , ecx
    add eax , 0Ah
    add eax , 73d
    sub eax , 65o
    add edx , eax

    call writedec
    call crlf
    call DumpRegs
    exit
main ENDP
END main
```



2)  $eax = 5ADh - ebx + 650 + 65d - 11110111 + 150$



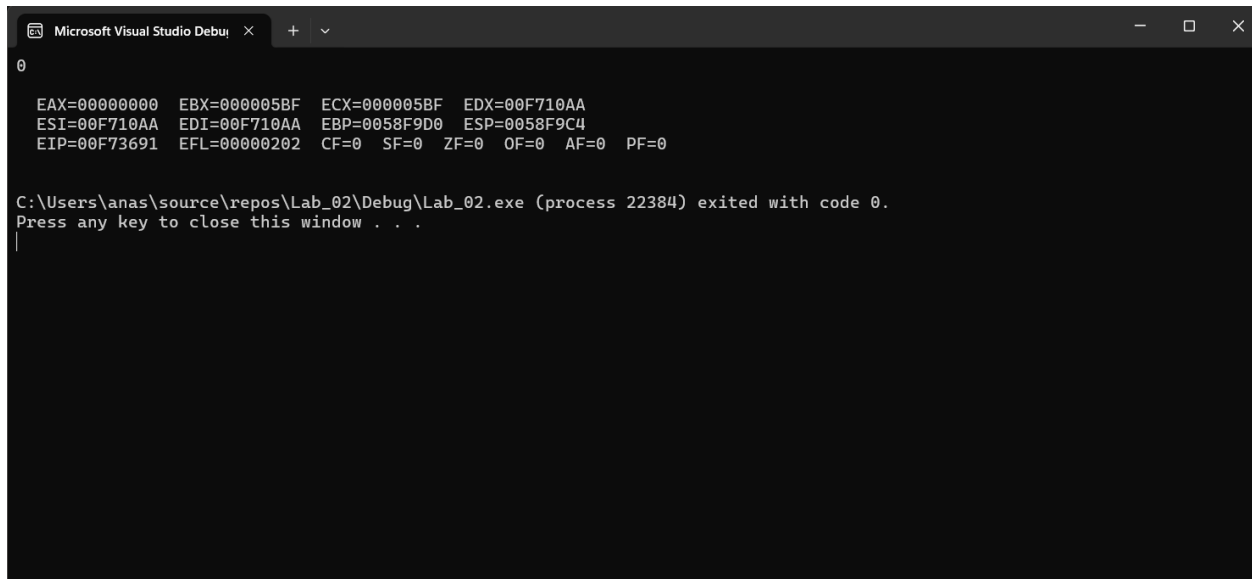
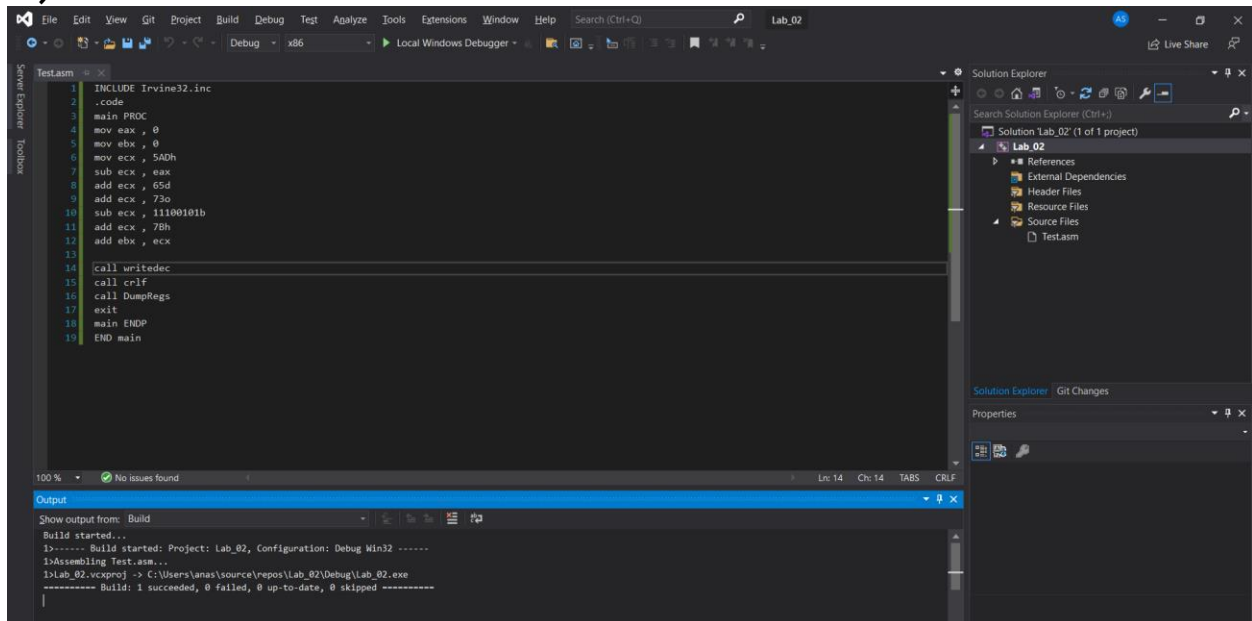
Code:

```
INCLUDE Irvine32.inc
.code
main PROC
mov eax, 0
mov ebx, 0
mov ecx, 5ADh
add ecx, 650
sub ecx, ebx
add ecx, 65d
sub ecx, 11110111b
add ecx, 150d
```

```
add eax , ecx
```

```
call writedec  
call crlf  
call DumpRegs  
exit  
main ENDP  
END main
```

3)  $ebx = 5ADh - eax + 65d + 730 - 11100101 + 7Bh$



Code:

```
INCLUDE Irvine32.inc  
.code
```

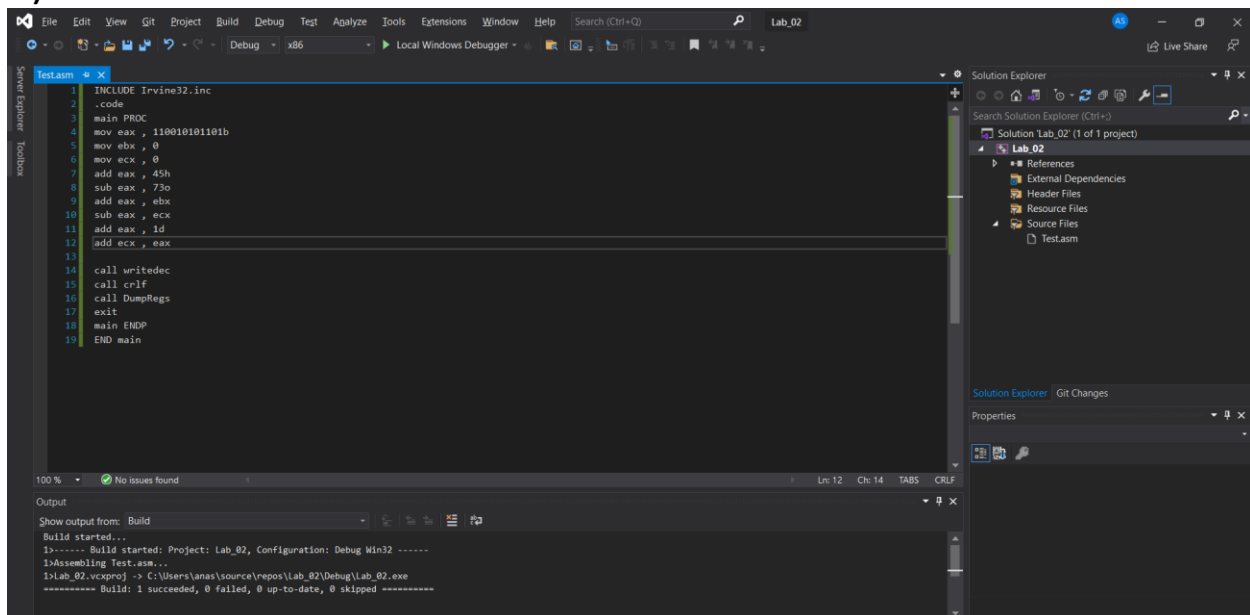
```

main PROC
mov eax , 0
mov ebx , 0
mov ecx , 5ADh
sub ecx , eax
add ecx , 65d
add ecx , 73o
sub ecx , 11100101b
add ecx , 7Bh
add ebx , ecx

call writedec
call crlf
call DumpRegs
exit
main ENDP
END main

```

4)  $ecx = 110010101101b + 45h - 73o + ebx - ecx + 1$



```
Microsoft Visual Studio Debug
3256
EAX=00000CB8  EBX=00000000  ECX=00000CB8  EDX=009810AA
ESI=009810AA  EDI=009810AA  EBP=012FF93C  ESP=012FF930
EIP=0098368D  EFL=00000202  CF=0   SF=0   ZF=0   OF=0   AF=0   PF=0

C:\Users\anas\source\repos\Lab_02\Debug\Lab_02.exe (process 22168) exited with code 0.
Press any key to close this window . . .
|
```

## Code:

```
INCLUDE Irvine32.inc
.code
main PROC
    mov eax , 110010101101b
    mov ebx , 0
    mov ecx , 0
    add eax , 45h
    sub eax , 73o
    add eax , ebx
    sub eax , ecx
    add eax , 1d
    add ecx , eax

    call writedec
    call crlf
    call DumpRegs
    exit
main ENDP
END main
```