LAB 01

COMPUTER ORGANIZATION AND ASSEMBLY LANG(COAL)

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STUDENT NAME	ROLL NO	SEC

SIGNATURE & DATE

MARKS AWARDED: _____

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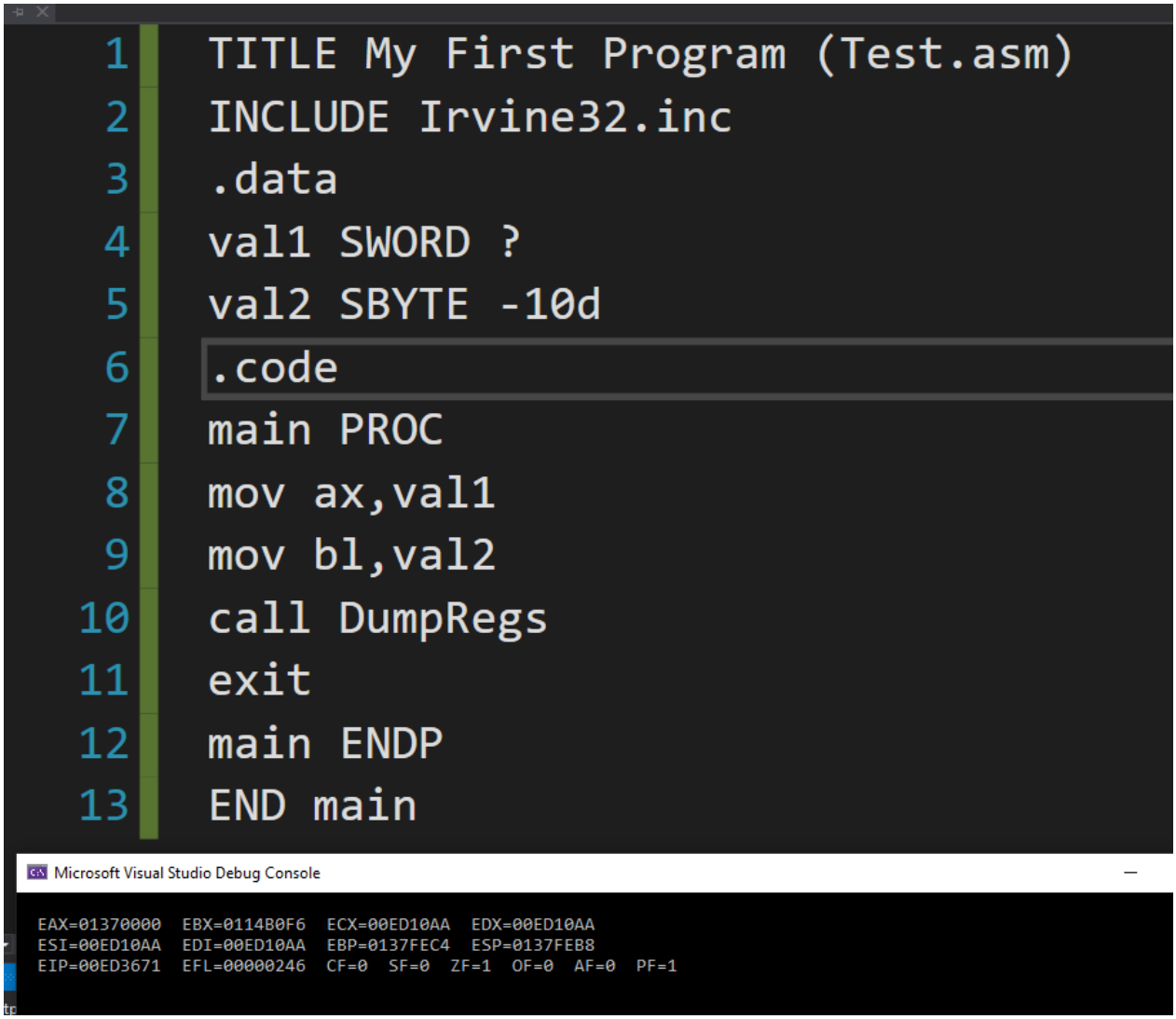
Version: 1.0

Date:

Task 01:

Write an uninitialized data declaration for a16-bit signed integer val1. Initialize 8-bit signed integer val2 with -10.

Initialized variables, moved to register and printed values

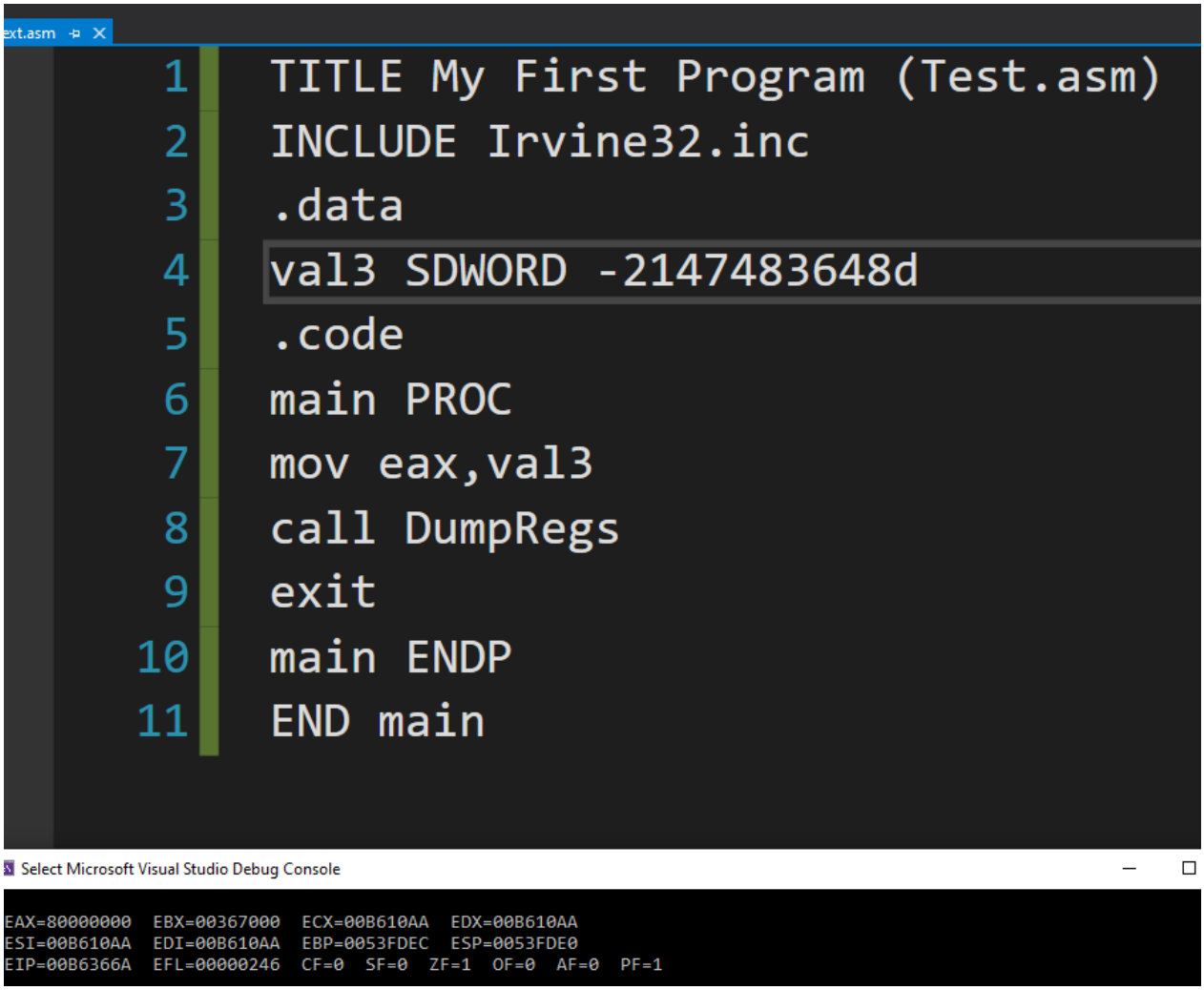


Task 02:

Declare a 32-bit signed integer val3 and initialize it with the smallest possible

negative decimal value.

Used SDWORD to initialize Signed DWORD 32 bit, input value of 2 to the power of -31 as the smallest possible decimal value.

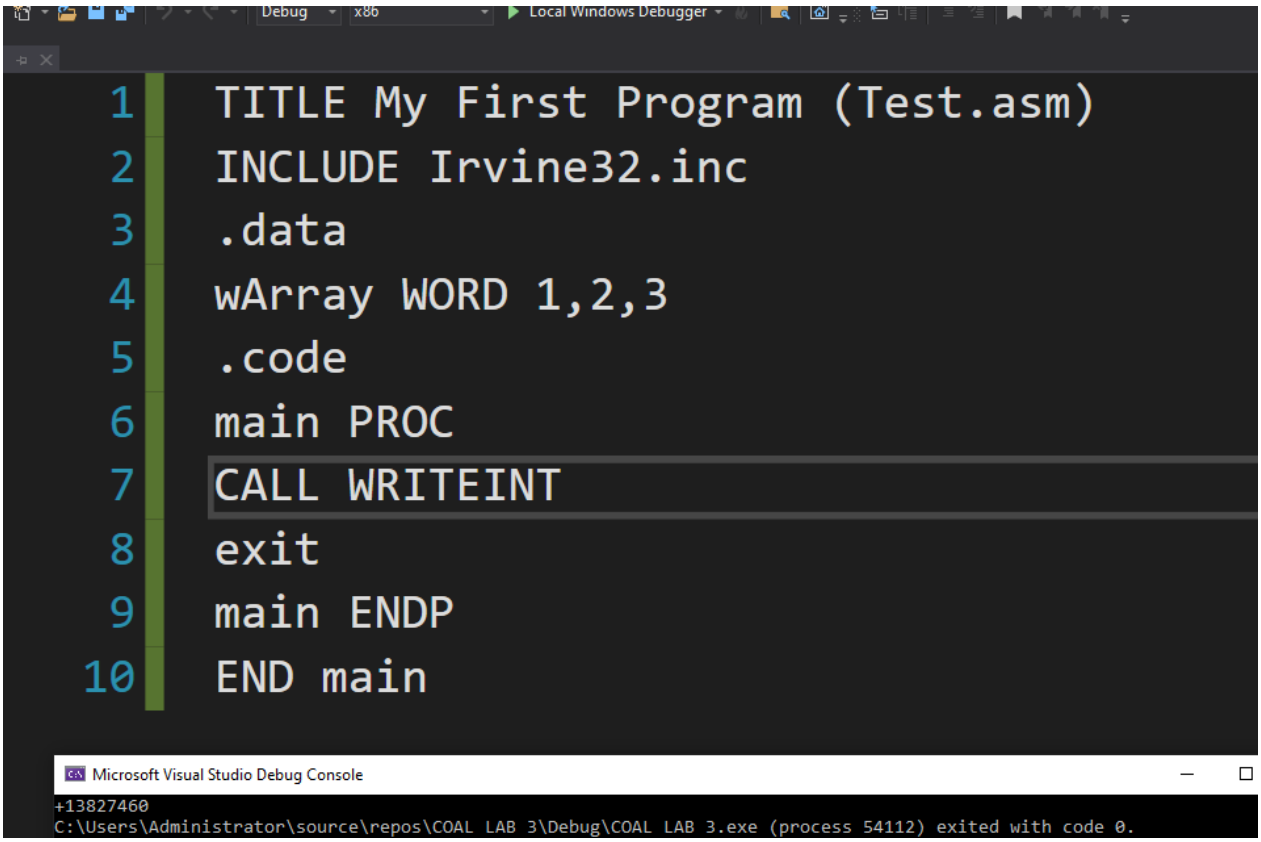


Task 03:

Declare an unsigned 16-bit integer variable named wArray that uses three

Initializers.

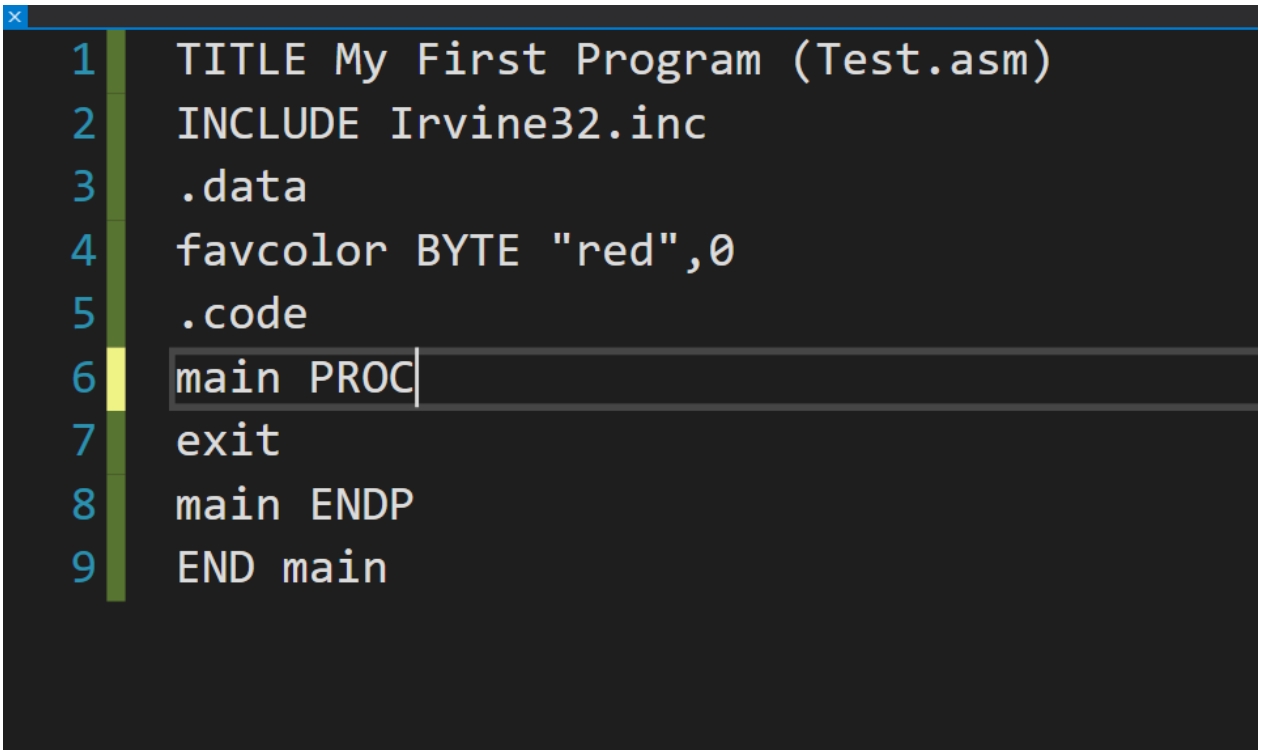
Learned how to initialize an array and display it using WRITEINT



Task 04:

Declare a string variable containing the name of your favorite color. Initialize it as a null terminated string

Initialized a string with a null terminator



Task 05:

Convert the following high-level instruction into Assembly

Language: ebx = { (a+b) – (a-b) + c } +d

a= 10h , b=15h, c=20h, d=30h

performed add and sub arithmetic operations and assigned the answer to ebx using zero extend

```
1  TITLE My First Program (Test.asm)
2  INCLUDE Irvine32.inc
3  .data
4  a BYTE 10h
5  b BYTE 15h
6  cat BYTE 20h
7  d BYTE 30h
8  .code
9  main PROC
10 mov al,a
11 add al,b
12 mov ah,a
13 sub ah,b
14 sub al,ah
15 add al,cat
16 add al,d
17 movzx ebx,al
18 call dumpregs
19 exit
20 main ENDP
21 END main
```

Microsoft Visual Studio Debug Console

```
EAX=008FFB7A  EBX=0000007A  ECX=002E10AA  EDX=002E10AA
ESI=002E10AA  EDI=002E10AA  EBP=008FF870  ESP=008FF864
EIP=002E368D  EFL=00000202  CF=0  SF=0  ZF=0  OF=0  AF=0  PF=0
```

Task 06:

Changed hexa values into binary and performed the same operation, resulting in the same answer

Text.asm

```
1  TITLE My First Program (Test.asm)
2  INCLUDE Irvine32.inc
3  .data
4  a BYTE 1010b
5  b BYTE 00010101b
6  cat BYTE 00100000b
7  d BYTE 00110000b
8  .code
9  main PROC
10 mov al,a
11 add al,b
12 mov ah,a
13 sub ah,b
14 sub al,ah
15 add al,cat
16 add al,d
17 movzx ebx,al
18 call dumpregs
19 exit
20 main ENDP
21 END main
```

Select Microsoft Visual Studio Debug Console

```
EAX=008FF57A  EBX=0000007A  ECX=00D910AA  EDX=00D910AA
ESI=00D910AA  EDI=00D910AA  EBP=008FF88C  ESP=008FF880
EIP=00D9368D  EFL=00000202  CF=0  SF=0  ZF=0  OF=0  AF=0  PF=0
```

Task 07:

Performed arithmetic operations

Text.asm

```
1  TITLE My First Program (Test.asm)
2  INCLUDE Irvine32.inc
3  .data
4  Data1 WORD 8h
5  Data2 WORD 15h
6  Data3 WORD 30h
7  Imm8=20
8  .code
9  main PROC
10 mov eax,0
11 mov ax,Imm8
12 add ax,Data1
13 sub ax,Data3
14 add ax,Imm8
15 add ax,Data2
16 movzx eax,ax
17 call dumpregs
18 exit
19 main ENDP
20 END main
```

Microsoft Visual Studio Debug Console

```
EAX=00000015  EBX=011A6000  ECX=003F10AA  EDX=003F10AA
ESI=003F10AA  EDI=003F10AA  EBP=012FFCD4  ESP=012FFCC8
EIP=003F368A  EFL=00000202  CF=0  SF=0  ZF=0  OF=0  AF=0  PF=0
```