

### COAL LAB 3-23k-0842-Kinza Afzal

Activity:

```
INCLUDE Irvine32.inc
.data
var1 BYTE 10h
.code
main PROC
mov al, var1
add al, 40h
call DumpRegs
exit
main ENDP
END main
```

```
INCLUDE Irvine32.inc
.data
var1 BYTE 10h
.code
main PROC
mov al, var1
add al, 40h
call DumpRegs
exit
main ENDP
END main
```

```
EAX=005F0050  EBX=007F5000  ECX=00C610AA  EDX=00C610AA
ESI=00C610AA  EDI=00C610AA  EBP=005FFC80  ESP=005FFC74
EIP=00C63670  EFL=00000206  CF=0   SF=0   ZF=0   OF=0   AF=0   PF=1
```

**Q1:**

1. Write an uninitialized data declaration for a 16-bit signed integer val1  
Initialize 8-bit signed integer val2 with -11.

```
INCLUDE Irvine32.inc
.data
val1 SWORD ?
val2 SBYTE -11d
.code
main PROC
call DumpRegs
exit
main ENDP
END main
```

**Q2:**

2. Declare a 32-bit signed integer val3 and initialize it with the smallest possible negative decimal value.

```
INCLUDE Irvine32.inc
.data
val3 SDWORD -2147483648d
.code
main PROC
call DumpRegs
exit
main ENDP
END main
```

Q3:

3. Declare an unsigned 16-bit integer variable named that uses three Initializers

```
INCLUDE Irvine32.inc
.data
list WORD 1000,2000,3000
.code
main PROC
call DumpRegs
exit
main ENDP
END main
```

Q4:

4. Declare a string variable containing the name of your favorite color. Initialize it as a null terminated string. Initialize five 16-bit unsigned integers A, B, C, D & E with the following values: 12, 2, 13, 8, 14.

```
INCLUDE Irvine32.inc
.data
favcolor BYTE "BLACK" ,0
A WORD 12
B WORD 2
C WORD 13
D WORD 8
E WORD 14
.code
main PROC
call DumpRegs
exit
main ENDP
END main
```

**Q5:**

5. Convert the following high-level instruction into Assembly Language:

$ebx = \{ (a+b) - (a-b) + c \} + d$

$a = 11h, b = 10h, c = 30h, d = 40h$

```
1  INCLUDE Irvine32.inc
2  .data
3  a BYTE 11h
4  b BYTE 10h
5  valc BYTE 30h
6  d BYTE 40h
7  .code
8  main PROC
9  mov eax, a
10 mov ecx, b
11 add eax, ecx
12 mov edx, a
13 sub edx, ecx
14 sub eax, edx
15 add eax, valc
16 add eax, d
17 mov ebx, eax
18 call DumpRegs
19 exit
20 main ENDP
21 END main
```

```
EAX=00000090  EBX=00000090  ECX=00000010  EDX=00000001
ESI=00B310AA  EDI=00B310AA  EBP=008FF948  ESP=008FF93C
EIP=00B3368A  EFL=00000206  CF=0  SF=0  ZF=0  OF=0  AF=0  PF=1

C:\Users\k230842\source\repos\COAllab\Debug\COAllab.exe (process 1344)
To automatically close the console when debugging stops, enable Tools->
```

**Q6:**

6. Convert the given values of a,b,c,d into binary and then use in 8-bit data definition and implement in the equation.

```
1  INCLUDE Irvine32.inc
2  .data
3  a byte 00010001b
4  b byte 00010000b
5  c1 byte 00110000b
6  d byte 01000000b
7  .code
8  main PROC
9  mov eax, 0
10 mov ebx, 0
11 mov al, a
12 add al, b
13 mov bl, al
14 mov al, a
15 sub al, b
16 sub bl, al
17 add bl, c1
18 add bl, d
19 movzx ebx, bl
20 Call DumpRegs
21 exit
22 main ENDP
23 END main
```

```
EAX=00000001  EBX=00000090  ECX=000B10AA  EDX=000B10AA
ESI=000B10AA  EDI=000B10AA  EBP=00DBF938  ESP=00DBF92C
EIP=000B3695  EFL=00000A86  CF=0  SF=1  ZF=0  OF=1  AF=0  PF=1
```

C:\Users\k230024\source\repos\Project1\Debug\Project1.exe (process 1432)  
To automatically close the console when debugging stops, enable Tools->Auto-close console when debugging stops.

**Q7:**

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

```
INCLUDE Irvine32.inc
.data
wArray WORD 1000h,2000h,3000h
.code
main PROC
call DumpRegs
exit
main ENDP
END main
```

**Q8:**

8. Declare an uninitialized array of 50 unsigned doublewords named dArray.

```
INCLUDE Irvine32.inc
.data
dArray DWORD 50 DUP(?)
.code
main PROC
call DumpRegs
exit
main ENDP
END main
```

**Q9:**

9. Declare a string variable containing the word "TEST" repeated 500 times.

```
INCLUDE Irvine32.inc
.data
var BYTE 500 DUP("TEST")
.code
main PROC

call DumpRegs
exit
main ENDP
END main
```

10. Declare an array of 20 unsigned bytes named bArray and initialize all elements

```
INCLUDE Irvine32.inc
.data
bArray BYTE 20 DUP (0)
.code
main PROC

call DumpRegs
exit
main ENDP
END main
```