

COAL LAB-9

TASK 1:

INCLUDE Irvine32.inc

```
.code
main PROC
;2^4 + 2^2 + 2^0
mov eax, 2
shl eax, 1
mov ebx, 4
shl ebx, 2
mov ecx, 1
shl ecx, 0
add eax, ebx
add eax, ecx
call crlf
call WriteDec
call crlf
call crlf
exit
main ENDP
END main
```

```
1  
2  
3 INCLUDE Irvine32.inc  
4  
5 .code  
6 main PROC  
7 ;2^4 + 2^2 + 2^0  
8 mov eax, 2  
9 shl eax, 1  
10 mov ebx, 4  
11 shl ebx, 2  
12 mov ecx, 1  
13 shl ecx, 0  
14 add eax, ebx  
15 add eax, ecx  
16 call crlf  
17 call WriteDec  
18 call crlf  
19 call crlf  
20 exit  
21 main ENDP  
22 END main  
23
```

Microsoft Visual Studio Debug Console

21

C:\Users\BLACKLIST\source\re
d with code 0.
Press any key to close this

TASK 2:

TITLE Task 2(Task.asm)

INCLUDE Irvine32.inc

.data

.code

main PROC

mov ax, -128

shl eax, 16

sar eax, 16

call WriteBin

call crlf

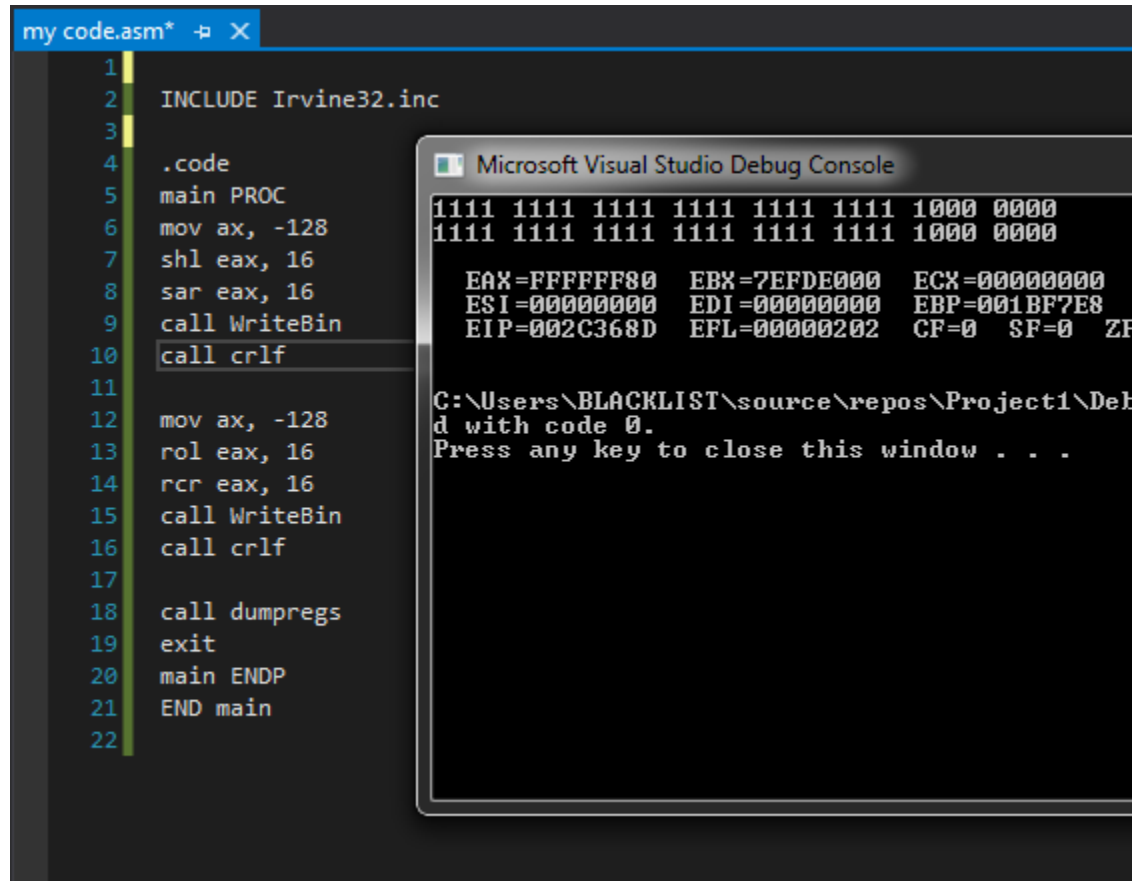
mov ax, -128

rol eax, 16

rcr eax, 16

```
call WriteBin
call crlf
```

```
call dumpregs
exit
main ENDP
END main
```



The screenshot shows the Visual Studio IDE with an assembly file named 'my code.asm*'. The code is as follows:

```
1
2 INCLUDE Irvine32.inc
3
4 .code
5 main PROC
6 mov ax, -128
7 shl eax, 16
8 sar eax, 16
9 call WriteBin
10 call crlf
11
12 mov ax, -128
13 rol eax, 16
14 rcr eax, 16
15 call WriteBin
16 call crlf
17
18 call dumpregs
19 exit
20 main ENDP
21 END main
22
```

Overlaid on the code editor is the 'Microsoft Visual Studio Debug Console'. It displays memory dump data and register values:

```
1111 1111 1111 1111 1111 1111 1000 0000
1111 1111 1111 1111 1111 1111 1000 0000

EAX=FFFFFFFF80 EBX=7EFDE000 ECX=00000000
ESI=00000000 EDI=00000000 EBP=001BF7E8
EIP=002C368D EFL=00000202 CF=0 SF=0 ZF=0
```

Below the register dump, the console shows the program's execution path and a prompt to close the window:

```
C:\Users\BLACKLIST\source\repos\Project1\Debug
d with code 0.
Press any key to close this window . . .
```

TASK 3:

```
INCLUDE Irvine32.inc
```

```
.data
bMinute BYTE ?
```

```
.code
main PROC
mov ax, 011100111111110b ;mins = 001111
shr ax, 5
and ax, 0011111b
```

```

mov bMinute, al
movzx eax, bMinute
call crlf
call WriteBin
call crlf
call WriteDec
call crlf
call dumpregs
exit
main ENDP
END main

```

The screenshot shows the Visual Studio IDE with an assembly file named 'my code.asm'. The code is as follows:

```

1
2  INCLUDE Irvine32.inc
3
4  .data
5  bMinute BYTE ?
6
7  .code
8  main PROC
9  mov ax, 0111001111111110b ;mins = 001111
10 shr ax, 5
11 and ax, 00111111b
12 mov bMinute, al
13 movzx eax, bMinute
14 call crlf
15 call WriteBin
16 call crlf
17 call WriteDec
18 call crlf
19 call dumpregs
20 exit
21 main ENDP
22 END main
23

```

Overlaid on the bottom right is the 'Microsoft Visual Studio Debug Console'. It displays the following output:

```

0000 0000 0000 0000 0000 0000 0000 1111
15
EAX=0000000F  EBX=7EFDE000  ECX=00000000
ESI=00000000  EDI=00000000  EBP=003CFBE4
EIP=011A3696  EFL=00000202  CF=0  SF=0  ZF=0
C:\Users\BLACKLIST\source\repos\Project1\Deh
d with code 0.
Press any key to close this window . . .

```

TASK 4:

```
INCLUDE Irvine32.inc
```

```
.code
main PROC
mov eax, 000000h
mov ax, 0A95Bh
mov bx, 0FFFFh
mov cx, ax
and cx, 0000000000000111b
ror cx, 20
shr bx, 4
add bx, cx
mov ax, bx
call WriteBin
call crlf
call WriteHex

call crlf
call crlf

mov eax, 000000h
mov ax, 0A95Bh
mov bx, 0FFFFh
shrd bx, ax, 4
mov ax, bx
call WriteBin
call crlf
call WriteHex

call dumpregs
exit
main ENDP
END main
```

```
my code.asm*  -p X
1
2  INCLUDE Irvine32.inc
3
4  .code
5  main PROC
6  mov eax, 000000h
7  mov ax, 0A95Bh
8  mov bx, 0FFFFh
9  mov cx, ax
10 and cx, 0000000000001111b
11 ror cx, 20
12 shr bx, 4
13 add bx, cx
14 mov ax, bx
15 call WriteBin
16 call crlf
17 call WriteHex
18
19 call crlf
20 call crlf
21
22 mov eax, 000000h
23 mov ax, 0A95Bh
24 mov bx, 0FFFFh
25 shrd bx, ax, 4
26 mov ax, bx
27 call WriteBin
28 call crlf
29 call WriteHex
30
31 call dumpregs
32 exit
33 main ENDP
34 END main
35
```

Microsoft Visual Studio Debug Console

```
0000 0000 0000 0000 1011 1111 1111 1111
0000BFFF
0000 0000 0000 0000 1011 1111 1111 1111
0000BFFF
EAX=0000BFFF EBX=7EFDBFFF ECX=0000B000 EDX=00000000
ESI=00000000 EDI=00000000 EBP=004AFD0C ESP=004AFD0C
EIP=001536C4 EFL=00000202 CF=0 SF=0 ZF=0 OF=0
C:\Users\BLACKLIST\source\repos\Project1\Debug\Project1.exe
d with code 0.
Press any key to close this window . . .
```

TASK 5:

INCLUDE Irvine32.inc

.data

val1 SBYTE -30

val2 SBYTE -15

val3 SBYTE -5

```

.code
main PROC
mov eax, 0000000h
mov al, val2
CBW
idiv val3
mov bx, ax
mov al, val1
CBW
idiv val2
imul bl
call WriteInt
call crlf

call dumpregs
exit
main ENDP
END main

```

The screenshot shows the Visual Studio IDE with an assembly file named 'my code.asm*'. The code is as follows:

```

1  INCLUDE Irvine32.inc
2
3
4  .data
5  val1 SBYTE -30
6  val2 SBYTE -15
7  val3 SBYTE -5
8
9  .code
10 main PROC
11 mov eax, 0000000h
12 mov al, val2
13 CBW
14 idiv val3
15 mov bx, ax
16 mov al, val1
17 CBW
18 idiv val2
19 imul bl
20 call WriteInt
21 call crlf
22
23 call dumpregs
24 exit
25 main ENDP
26 END main

```

Overlaid on the code editor is the 'Microsoft Visual Studio Debug Console' window. It displays the following register values:

Register	Value
EAX	00000006
EBX	7EFD0003
ECX	00000000
ESI	00000000
EDI	00000000
EBP	00000000
EIP	009A3693
EFL	00000202
CF	0

Below the register dump, the console shows the output of the program:

```

C:\Users\BLACKLIST\source\repos\Project\bin\Debug\Project.exe
d with code 0.
Press any key to close this window .

```

TASK 6:

INCLUDE Irvine32.inc

.data

val1 QWORD 20

val2 QWORD 80

.code

main PROC

CALL Extended_Add

add eax,ebx

call crlf

call writedec

call crlf

Extended_Add PROC

mov ebx,DWORD PTR [val1]

mov eax,DWORD PTR [val2]

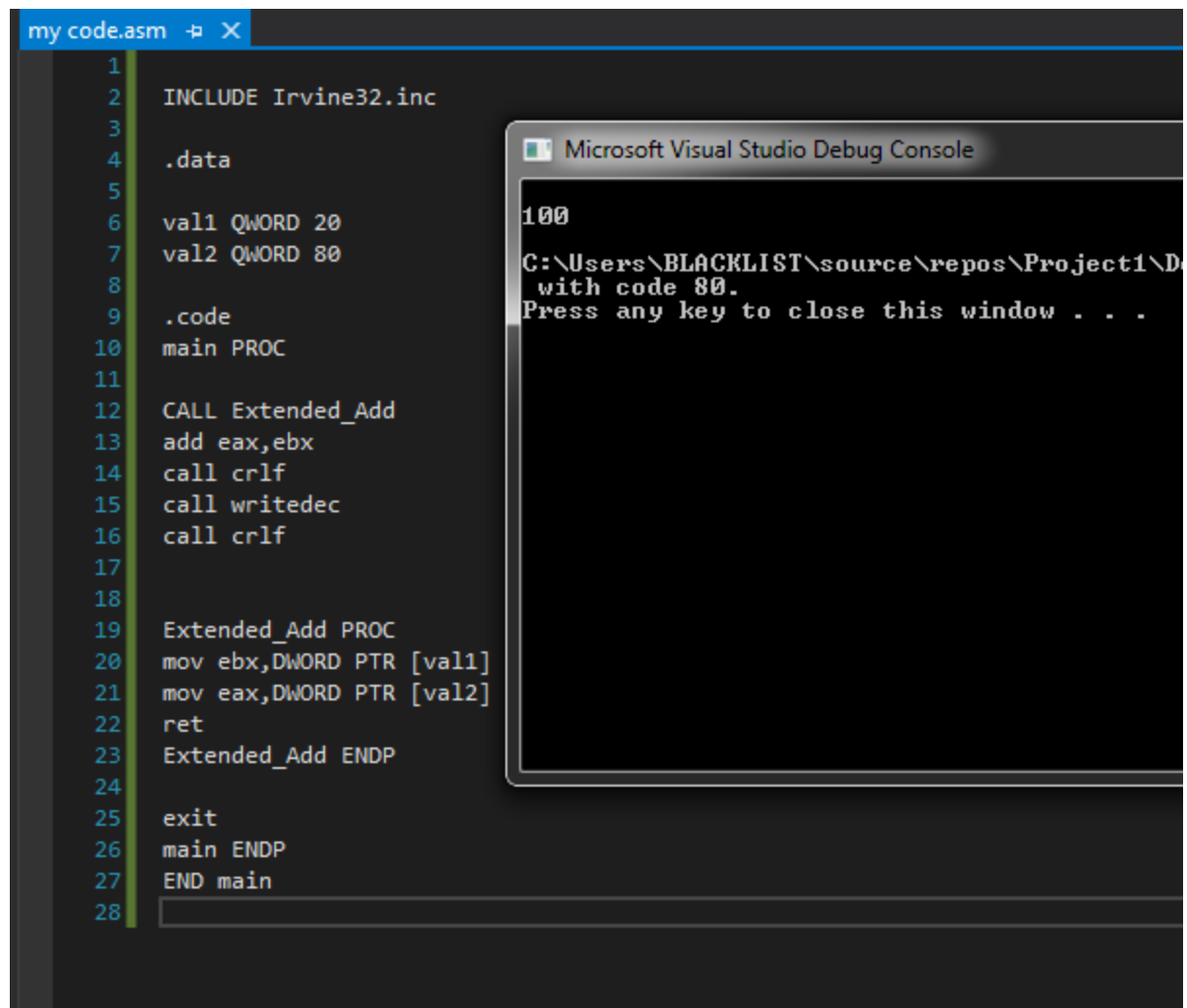
ret

Extended_Add ENDP

exit

main ENDP

END main



The image shows a Visual Studio IDE window with a file named 'my code.asm' open. The assembly code is as follows:

```
1
2  INCLUDE Irvine32.inc
3
4  .data
5
6  val1 QWORD 20
7  val2 QWORD 80
8
9  .code
10 main PROC
11
12 CALL Extended_Add
13 add eax,ebx
14 call crlf
15 call writedec
16 call crlf
17
18
19 Extended_Add PROC
20 mov ebx,DWORD PTR [val1]
21 mov eax,DWORD PTR [val2]
22 ret
23 Extended_Add ENDP
24
25 exit
26 main ENDP
27 END main
28
```

Overlaid on the bottom right of the code editor is a 'Microsoft Visual Studio Debug Console' window. It displays the following text:

```
100
C:\Users\BLACKLIST\source\repos\Project1\D
with code 80.
Press any key to close this window . . .
```

NAME: MAQBOOL AHMED
ROLLNO: 20K-1610