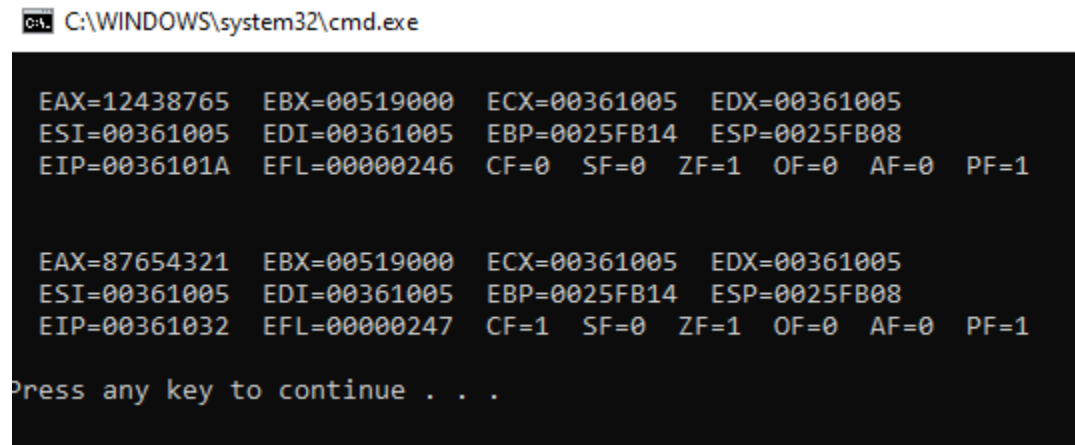# Coal Lab Tasks 8:

Task 1:

Code:

```
INCLUDE Irvine32.inc
.data
value DWORD 12438765h
.code
main PROC
mov eax, value
call DumpRegs
rol value, 16
mov eax,value
rol ax, 8
rol al, 4
call Dumpregs
exit
main ENDP
END main
```

Screenshot:

C:\WINDOWS\system32\cmd.exe

```
EAX=12438765  EBX=00519000  ECX=00361005  EDX=00361005
ESI=00361005  EDI=00361005  EBP=0025FB14  ESP=0025FB08
EIP=0036101A  EFL=00000246  CF=0  SF=0  ZF=1  OF=0  AF=0  PF=1


EAX=87654321  EBX=00519000  ECX=00361005  EDX=00361005
ESI=00361005  EDI=00361005  EBP=0025FB14  ESP=0025FB08
EIP=00361032  EFL=00000247  CF=1  SF=0  ZF=1  OF=0  AF=0  PF=1

Press any key to continue . . .
```
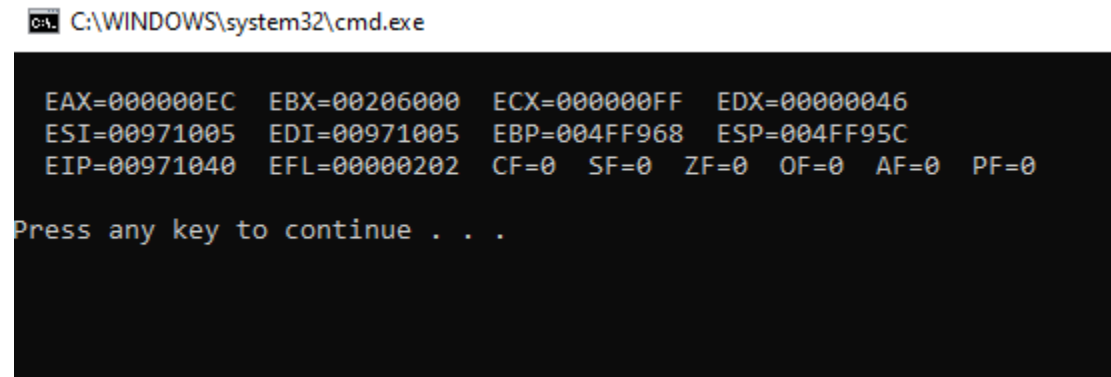
Task 2:

Code:

```
INCLUDE Irvine32.inc
.data
Byte1 byte 3Bh
Byte2 byte 46h
Byte3 byte 0FFh
.code
main PROC
movzx eax, Byte1
movzx edx, Byte2
movzx ecx, Byte3
shl eax, 8
shl ebx, 8
shl ecx, 8
sar eax, 8
sar ebx, 8
sar ecx, 8
shld eax, ecx, 2
call Dumpregs
exit
main ENDP
END main
```

Screenshot:


```
C:\WINDOWS\system32\cmd.exe

 EAX=000000EC  EBX=00206000  ECX=000000FF  EDX=00000046
 ESI=00971005  EDI=00971005  EBP=004FF968  ESP=004FF95C
 EIP=00971040  EFL=00000202  CF=0  SF=0  ZF=0  OF=0  AF=0  PF=0

Press any key to continue . . .
```

Task 3:

Code:

```
INCLUDE Irvine32.inc
.data
value DWORD 32142
.code
main PROC
mov eax, 0
mov ebx, 0
mov ebx, value
shr ebx, 3
mov ax, bx
call Dumpregs
exit
main ENDP
END main
```

Screenshot:

C:\WINDOWS\system32\cmd.exe

```
 EAX=00000FB1  EBX=00000FB1  ECX=00B91005  EDX=00B91005
 ESI=00B91005  EDI=00B91005  EBP=00EFFABC  ESP=00EFFAB0
 EIP=00B9102B  EFL=00000207  CF=1  SF=0  ZF=0  OF=0  AF=0  PF=1

Press any key to continue . . .
```
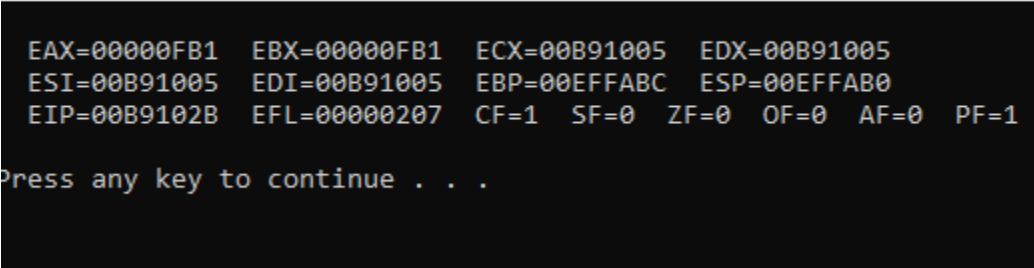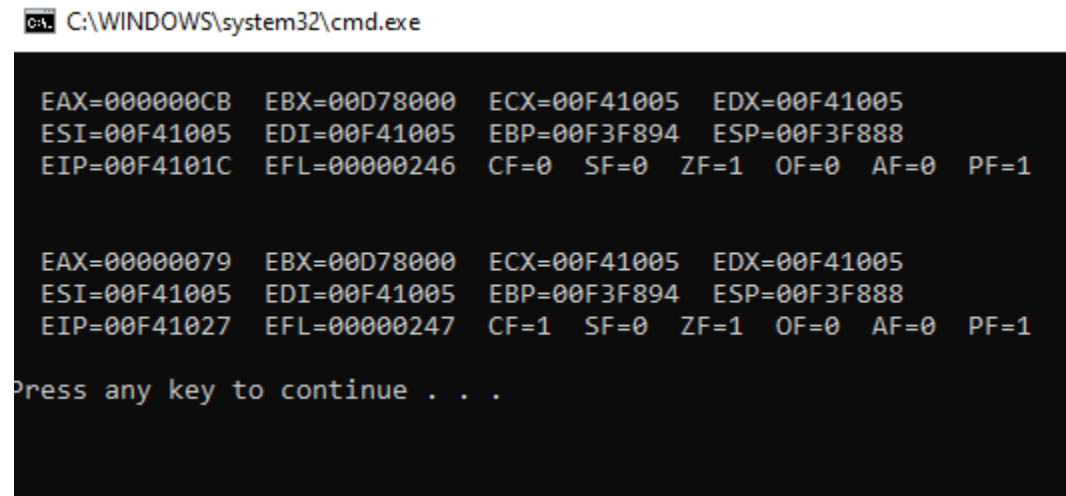
Task 4:

Code:

```
INCLUDE Irvine32.inc
.code
main PROC
mov eax,0
mov al,11001011b
call Dumpregs
rol al,2
rol al,3
call Dumpregs
exit
main ENDP
END main
```

Screenshot:

C:\WINDOWS\system32\cmd.exe

```
 EAX=000000CB  EBX=00D78000  ECX=00F41005  EDX=00F41005
 ESI=00F41005  EDI=00F41005  EBP=00F3F894  ESP=00F3F888
 EIP=00F4101C  EFL=00000246  CF=0  SF=0  ZF=1  OF=0  AF=0  PF=1


 EAX=00000079  EBX=00D78000  ECX=00F41005  EDX=00F41005
 ESI=00F41005  EDI=00F41005  EBP=00F3F894  ESP=00F3F888
 EIP=00F41027  EFL=00000247  CF=1  SF=0  ZF=1  OF=0  AF=0  PF=1

Press any key to continue . . .
```
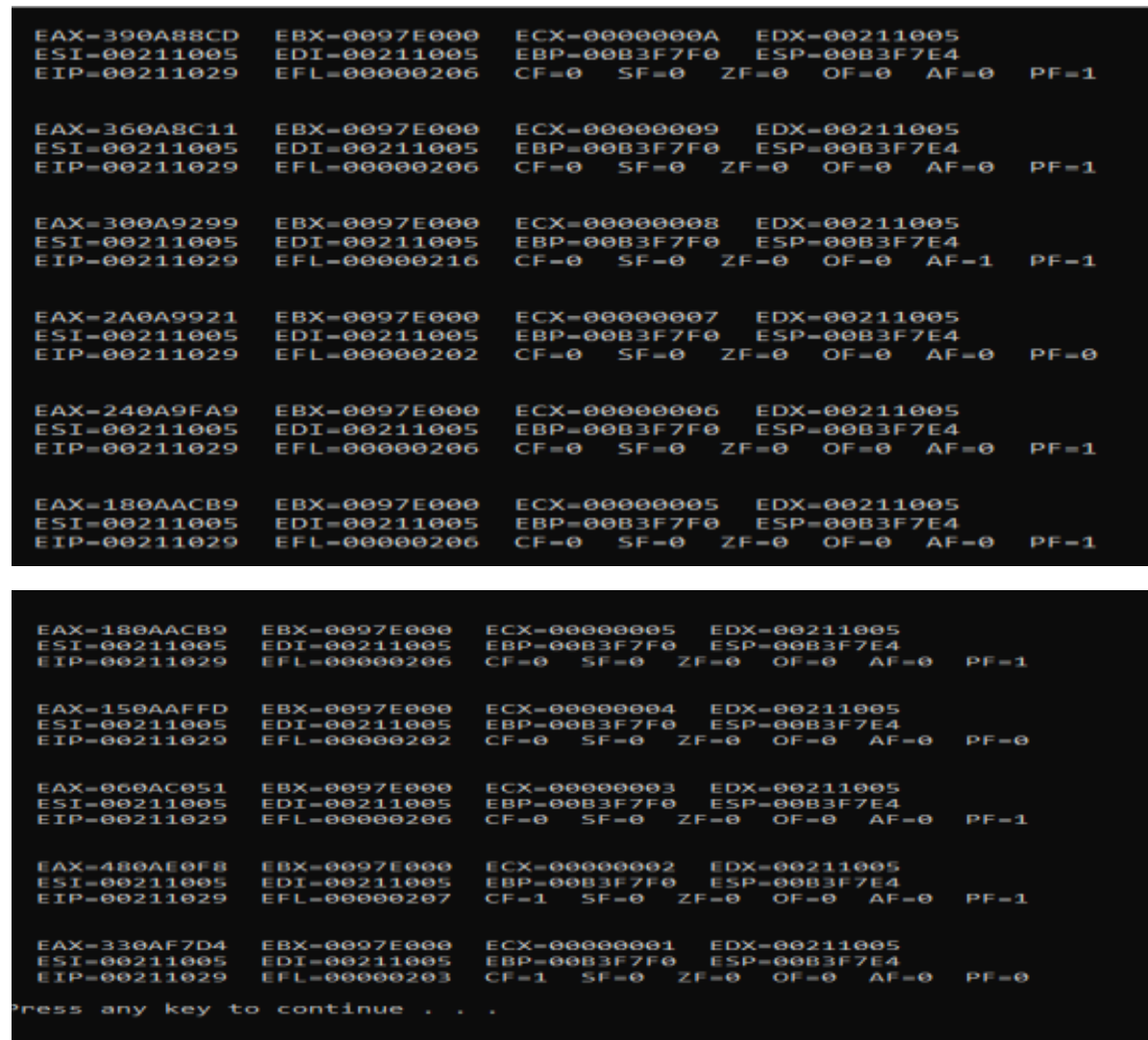
Task 5:

Code:

```
INCLUDE Irvine32.inc
.code
main PROC
mov ecx, 10
hello:
        call randomize
        mov eax, 50000000h
        call RandomRange
        call Dumpregs
LOOP hello
exit
main ENDP
END main
```

Screenshot:

```
EAX=390A88CD   EBX=0097E000   ECX=0000000A   EDX=00211005
ESI=00211005   EDI=00211005   EBP=00B3F7F0   ESP=00B3F7E4
EIP=00211029   EFL=00000206   CF=0  SF=0  ZF=0  OF=0  AF=0   PF=1


EAX=360A8C11   EBX=0097E000   ECX=00000009   EDX=00211005
ESI=00211005   EDI=00211005   EBP=00B3F7F0   ESP=00B3F7E4
EIP=00211029   EFL=00000206   CF=0  SF=0  ZF=0  OF=0  AF=0   PF=1


EAX=300A9299   EBX=0097E000   ECX=00000008   EDX=00211005
ESI=00211005   EDI=00211005   EBP=00B3F7F0   ESP=00B3F7E4
EIP=00211029   EFL=00000216   CF=0  SF=0  ZF=0  OF=0  AF=1   PF=1


EAX=2A0A9921   EBX=0097E000   ECX=00000007   EDX=00211005
ESI=00211005   EDI=00211005   EBP=00B3F7F0   ESP=00B3F7E4
EIP=00211029   EFL=00000202   CF=0  SF=0  ZF=0  OF=0  AF=0   PF=0


EAX=240A9FA9   EBX=0097E000   ECX=00000006   EDX=00211005
ESI=00211005   EDI=00211005   EBP=00B3F7F0   ESP=00B3F7E4
EIP=00211029   EFL=00000206   CF=0  SF=0  ZF=0  OF=0  AF=0   PF=1


EAX=180AACB9   EBX=0097E000   ECX=00000005   EDX=00211005
ESI=00211005   EDI=00211005   EBP=00B3F7F0   ESP=00B3F7E4
EIP=00211029   EFL=00000206   CF=0  SF=0  ZF=0  OF=0  AF=0   PF=1
```

```
EAX=180AACB9   EBX=0097E000   ECX=00000005   EDX=00211005
ESI=00211005   EDI=00211005   EBP=00B3F7F0   ESP=00B3F7E4
EIP=00211029   EFL=00000206   CF=0  SF=0  ZF=0  OF=0  AF=0   PF=1


EAX=150AAFFD   EBX=0097E000   ECX=00000004   EDX=00211005
ESI=00211005   EDI=00211005   EBP=00B3F7F0   ESP=00B3F7E4
EIP=00211029   EFL=00000202   CF=0  SF=0  ZF=0  OF=0  AF=0   PF=0


EAX=060AC051   EBX=0097E000   ECX=00000003   EDX=00211005
ESI=00211005   EDI=00211005   EBP=00B3F7F0   ESP=00B3F7E4
EIP=00211029   EFL=00000206   CF=0  SF=0  ZF=0  OF=0  AF=0   PF=1


EAX=480AE0F8   EBX=0097E000   ECX=00000002   EDX=00211005
ESI=00211005   EDI=00211005   EBP=00B3F7F0   ESP=00B3F7E4
EIP=00211029   EFL=00000207   CF=1  SF=0  ZF=0  OF=0  AF=0   PF=1


EAX=330AF7D4   EBX=0097E000   ECX=00000001   EDX=00211005
ESI=00211005   EDI=00211005   EBP=00B3F7F0   ESP=00B3F7E4
EIP=00211029   EFL=00000203   CF=1  SF=0  ZF=0  OF=0  AF=0   PF=0
Press any key to continue . . .
```
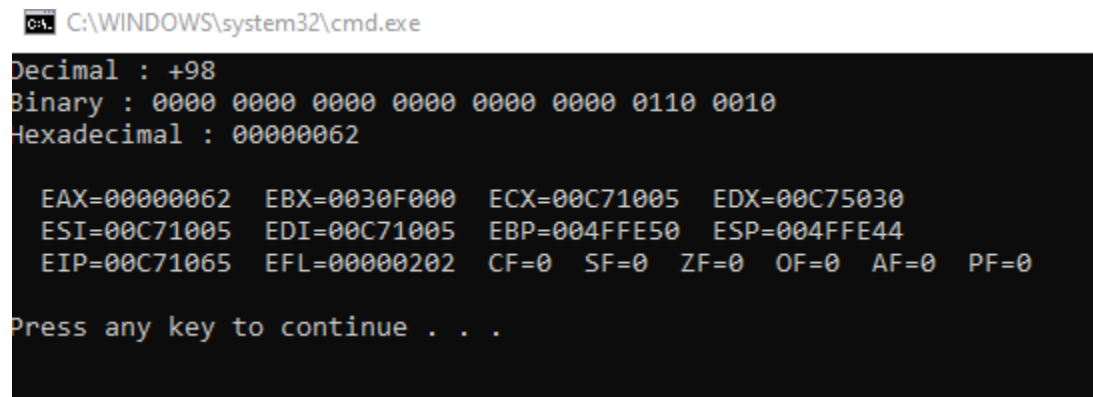
Task 6:

Code:

```
INCLUDE Irvine32.inc
.data
one BYTE "Enter Any Decimal Number: ",0
two BYTE "Decimal : ",0
three BYTE "Binary : ",0
four BYTE "Hexadecimal : ",0
.code
main PROC
mov edx, OFFSET one
call writeString
call ReadInt
call clrscr
mov edx, OFFSET two
call writeString
call writeInt
call crlf
mov edx, OFFSET three
call writeString
call writeBin
call crlf
mov edx, OFFSET four
call writeString
call writeHex
call crlf
call DumpRegs
exit
main ENDP
END main
```

Screenshot:


```
C:\WINDOWS\system32\cmd.exe

Decimal : +98
Binary : 0000 0000 0000 0000 0000 0000 0110 0010
Hexadecimal : 00000062

  EAX=00000062  EBX=0030F000  ECX=00C71005  EDX=00C75030
  ESI=00C71005  EDI=00C71005  EBP=004FFE50  ESP=004FFE44
  EIP=00C71065  EFL=00000202  CF=0  SF=0  ZF=0  OF=0  AF=0  PF=0

Press any key to continue . . .
```
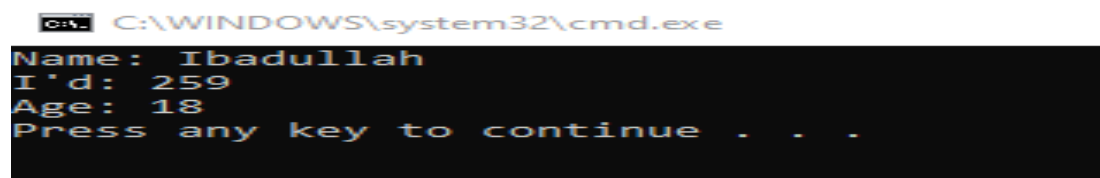
Task 7:

Code:

```
INCLUDE Irvine32.inc
.data
one BYTE "Enter Name of Employee: ",0
two BYTE "Enter ID of Employee: ",0
three BYTE "Enter Age of Employee: ",0
four BYTE "Name: ",0
five BYTE "I'd: ",0
six BYTE "Age: ",0
nam byte 15 dup(?)
age Dword ?
id Dword ?
.code
main PROC
mov edx, offset one
call writestring
mov edx, offset nam
mov ecx, lengthof nam
call ReadString
mov edx,offset two
call writestring
call ReadInt
mov id,eax
mov edx,offset three
call writestring
call ReadInt
mov age,eax
call clrscr
mov edx, offset four
call writestring
mov edx,offset nam
call writestring
call crlf
mov edx,offset five
call writestring
mov eax,id
call writeDec
call crlf
mov edx,offset six
call writestring
mov eax,age
call writeDec
call crlf
exit
main ENDP
END main
```

Screenshot:

Task 8:

Code:

```
INCLUDE Irvine32.inc
.data
one BYTE "Enter Name of Employee: ",0
two BYTE "Enter Employee ID    : ",0
three BYTE "Enter Year of Birth   : ",0
seven BYTE "Enter Annual Salary   : ",0
four BYTE "Name              : ",0
five BYTE "ID                : ",0
six BYTE "Year of Birth    : ",0
eight BYTE "Salary           : ",0
nine BYTE "TAX              : ",0
one0 BYTE "TAX",0
namee byte 20 dup(?)
age Dword ?
id Dword ?
salary Dword ?
tax Dword 0
info byte "Salary > 50000.",0
.code
main PROC
mov edx, offset one
call writestring
mov edx, offset namee
mov ecx, lengthof namee
call ReadString
mov edx, offset two
call writestring
call ReadInt
mov id, eax
mov edx, offset three
call writestring
call ReadInt
mov age, eax
mov edx, offset seven
call writestring
call ReadInt
mov salary, eax
mov ebx, 50000
cmp ebx, eax
jnc fast
mov ebx, offset one0
mov edx, offset info
call MsgBox
mov eax, salary
shr eax, 1
mov tax, eax
fast:
        call clrscr
        mov edx, offset four
        call writestring
        mov edx, offset namee
        call writestring
        call crlf
```

```
        mov edx, offset five
        call writestring
        mov eax, id
        call writeDec
        call crlf
        mov edx, offset six
        call writestring
        mov eax, age
        call writeDec
        call crlf
        mov edx, offset eight
        call writestring
        mov eax, salary
        call writeDec
        call crlf
        mov edx, offset nine
        call writestring
        mov eax, tax
        call writeDec
        call crlf
exit
main ENDP
END main
```

Screenshot: