COAL LAB 09 (2) (LAB TASKS)

TASK # 01:

CODE:

```
TITLE Task1 (test.asm)
INCLUDE IRVINE32.INC

.data
 value dword 12438765h
 message1 byte "The original value : ", 0
 message2 byte "The converted value : ", 0

.code
main proc

mov edx, offset message1
call writeString
mov eax, value
call writeHex
call crlf

mov ax, word ptr [value]
mov bx, word ptr[value+2]

xchg ax, word ptr[value+2]
xchg bx, word ptr[value]

mov al, byte ptr [value]
mov ah, byte ptr [value+1]

rol ah, 4

xchg al, byte ptr [value+1]
xchg ah, byte ptr [value]

mov edx, offset message2
call writeString
mov eax, value
call writeHex
call crlf

call DumpRegs
exit
main ENDP
END main
```
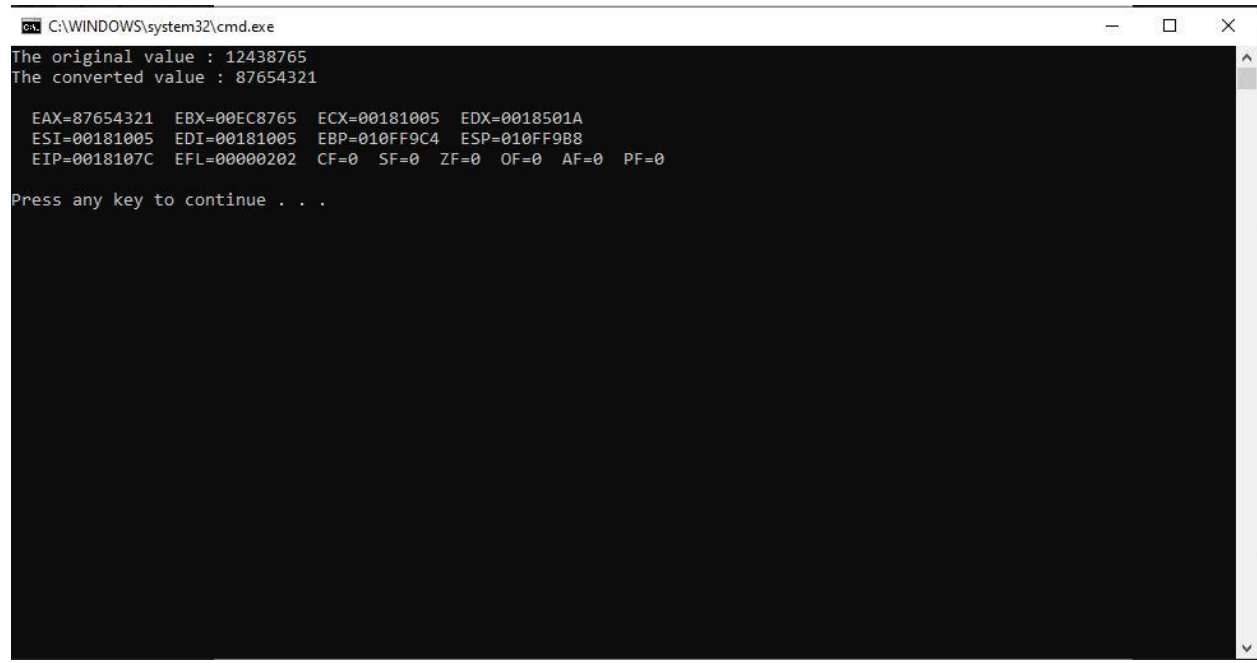
OUTPUT:

```
C:\WINDOWS\system32\cmd.exe                                    —  □  ✕
The original value : 12438765
The converted value : 87654321

 EAX=87654321  EBX=00EC8765  ECX=00181005  EDX=0018501A
 ESI=00181005  EDI=00181005  EBP=010FF9C4  ESP=010FF9B8
 EIP=0018107C  EFL=00000202  CF=0  SF=0  ZF=0  OF=0  AF=0  PF=0

Press any key to continue . . .
```

TASK # 02:

CODE:

```
TITLE Task2 (test.asm)
INCLUDE IRVINE32.INC

.data
Byte1 byte 3Bh
Byte2 byte 46h
Byte3 byte 0FFh

message1 byte "Data before shifting : ", 0
message2 byte "Data after shifting : ", 0

.code
main proc

mov eax, 0

mov edx, offset message1
call WriteString
mov al, Byte1
call WriteHex
call crlf

mov edx, offset message2
call WriteString
shl Byte1, 3
mov al, Byte1
call WriteHex
call Crlf
call crlf


mov edx, offset message1
call WriteString
mov al, Byte2
call WriteHex
call crlf

mov edx, offset message2
call WriteString
shr Byte2, 5
mov al, Byte2
```

```
call WriteHex
call Crlf
call Crlf


mov edx, offset message1
call WriteString
mov al, Byte3
call WriteHex
call crlf

mov edx, offset message2
call WriteString
SHL Byte3, 3
mov al, Byte3
call WriteHex
call Crlf
call Crlf

exit
main ENDP
END main
```
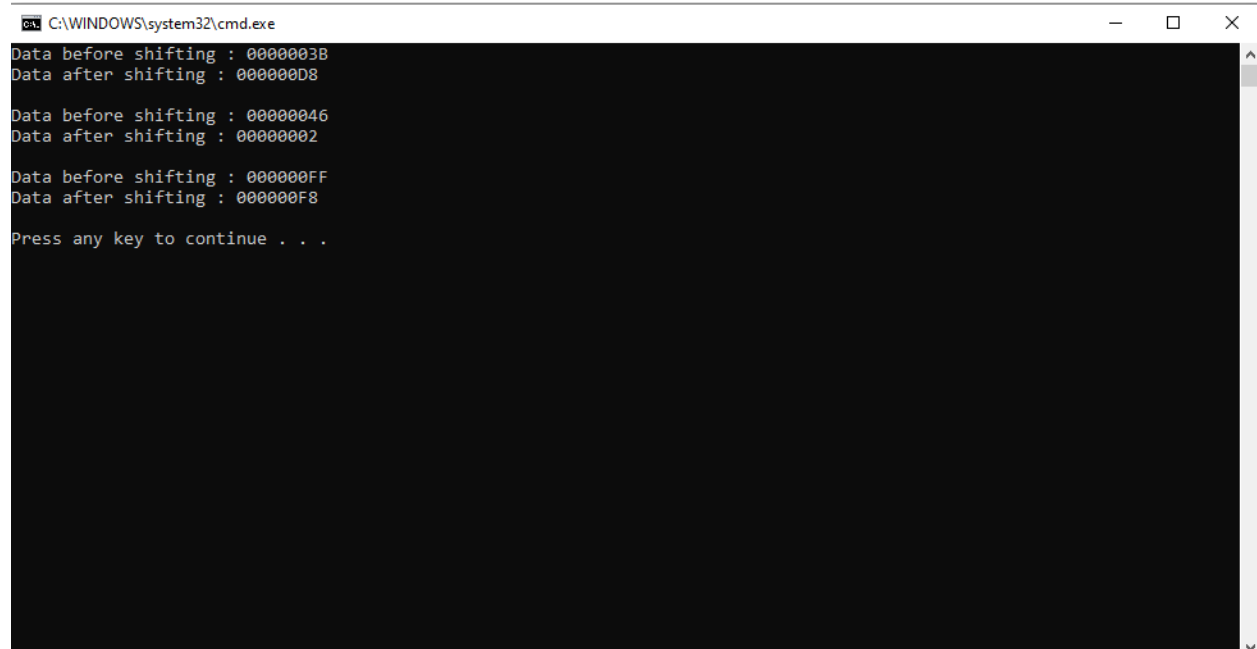
OUTPUT:


```
C:\WINDOWS\system32\cmd.exe                                    —    □    ×
Data before shifting : 0000003B
Data after shifting : 000000D8

Data before shifting : 00000046
Data after shifting : 00000002

Data before shifting : 000000FF
Data after shifting : 000000F8

Press any key to continue . . .
```

TASK # 03:

CODE:

```
TITLE Task3 (test.asm)
INCLUDE IRVINE32.INC

.data
val word 32142
message1 byte "The quotient after dividing 32142 through bitwise division using shr(3): ", 0

.code
main proc

mov ebx, 0
mov bx, val
shr bx, 3

mov eax, 0
mov ax, bx
mov edx, offset message1
call WriteString
call writeDec
call crlf
call crlf

call dumpregs
exit
main ENDP
END main
```
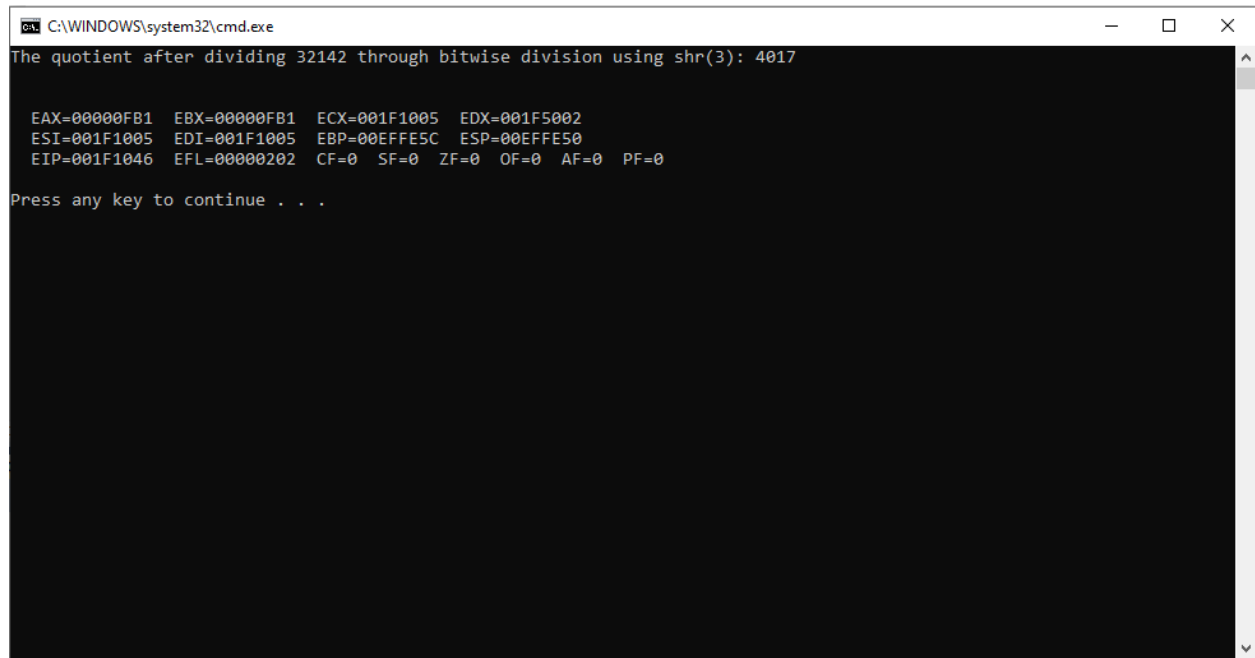
OUTPUT:

```
C:\WINDOWS\system32\cmd.exe                                              —    □    ×
The quotient after dividing 32142 through bitwise division using shr(3): 4017


 EAX=00000FB1  EBX=00000FB1  ECX=001F1005  EDX=001F5002
 ESI=001F1005  EDI=001F1005  EBP=00EFFE5C  ESP=00EFFE50
 EIP=001F1046  EFL=00000202  CF=0  SF=0  ZF=0  OF=0  AF=0  PF=0

Press any key to continue . . .
```

TASK # 04:

CODE:

```
TITLE Task4 (test.asm)
INCLUDE IRVINE32.INC

.data
message1 byte "Output after 1st rotation : ", 0
message2 byte "Output after 2nd rotation : ", 0

.code
main proc

mov eax, 0

;a)
mov al, 11001011b
stc                              ; to set carry flag = 1

mov cl, 2
rol al, cl

mov edx, offset message1
call writeString
call writeBin
call crlf


;b)
mov al, 11001011b
stc                              ; to set carry flag = 1

mov cl, 3
rol al, cl

mov edx, offset message2
call writeString
call writeBin
call crlf

call dumpregs
exit
main ENDP
END main
```

OUTPUT:


```
Output after 1st rotation : 0000 0000 0000 0000 0000 0000 0010 1111
Output after 2nd rotation : 0000 0000 0000 0000 0000 0000 0101 1110

 EAX=0000005E  EBX=0092E000  ECX=00631003  EDX=0063501D
 ESI=00631005  EDI=00631005  EBP=007BFD2C  ESP=007BFD20
 EIP=00631050  EFL=00000202  CF=0  SF=0  ZF=0  OF=0  AF=0  PF=0

Press any key to continue . . .
```