

Assignment 10 | MFP

CE-092

Assignment submission for Microprocessor Fundamentals and Programming subject week 10.

nevilparmar24@gmail.com

Task 1:

Convert 8 bit binary number to gray code.

Driver Code:

```
extrn convertToGray:far
data segment
    n db 0cdh
    answer dw ?
data ends

stack_seg segment stack
    dw 20 dup(0)
    top label word
stack_seg ends

code segment
    assume cs:code, ds:data, ss:stack_seg
    mov ax,data
    mov ds,ax
    mov ax,stack_seg
    mov ss,ax
    mov sp,top
```

```
    xor ax,ax
    mov al,n
    call convertToGray
    mov answer,ax
    int 03h
code ends
end
```

External File Code :

```
public convertToGray

code_ext segment
assume cs:code_ext
proc convertToGray far
    mov bl,al
    clc
    rcr al,1
    xor al,bl
    ret
endp convertToGray
code_ext ends
end
```

Output:

```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...
C:\>cd DEBUG125
C:\DEBUG125>debug ..\P1-DRI~1.EXE
-g=0040
Unexpected breakpoint interrupt
AX=00AB BX=00CD CX=0068 DX=0000 SP=0000 BP=0000 SI=0000 DI=0000
DS=0744 ES=0734 SS=0745 CS=0744 IP=005D NU UP EI NG NZ NA PO NC
0744:005D 0000          ADD     IBX+SI,AL          DS:00CD=98
-d
0744:0000  CD AB 00 00 00 00 00 00 00-00 00 00 00 00 00 00 .....
0744:0010  00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 .....
0744:0020  00 00 00 00 00 00 00 00 00-00 00 00 00 40 00 00 .....@...
0744:0030  44 07 00 00 46 72 00 00 00-00 00 00 00 00 00 00 D...Fr.....
0744:0040  B8 44 07 8E D8 B8 45 07-8E D0 36 8B 26 28 00 33 .D...E...6.&(.3
0744:0050  C0 A0 00 00 9A 00 00 4A-07 A3 01 00 CC 00 00 00 .....J.....
0744:0060  8A D8 F8 D0 D8 32 C3 CB-E8 5E 3B E8 43 3B E8 82 .....2...^;.C;..
0744:0070  3B E9 DD 04 BF 3C 01 57-8B D8 E8 87 EE 26 C7 06 ;....<.W.....&..
```

Task 2:

Convert temp from Fahrenheit to Celsius.

Driver Code:

```
extrn cel:far

    data segment public
        n db 0cdh
        answer db ?
    data ends

stack_seg segment stack
    dw 20 dup(0)
    top label word
stack_seg ends

code segment
assume cs:code, ds:data, ss:stack_seg
    mov ax,data
    mov ds,ax
```

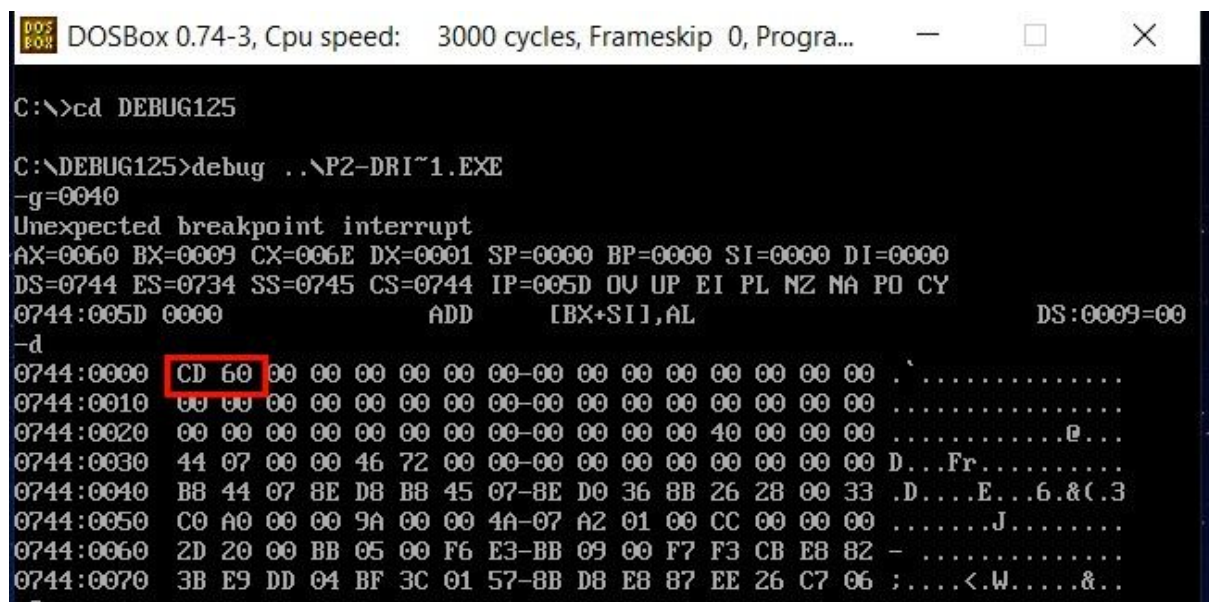
```
    mov ax,stack_seg
    mov ss,ax
    mov sp,top
    xor ax,ax
    mov al,n
    call cel
    mov answer,al
    int 03h
code ends
end
```

External File Code :

```
public cel

code_ext segment
assume cs:code_ext
    proc cel far
    sub ax,32
    mov bx,0005h
    mul bl
    mov bx,0009h
    div bx
    ret
    endp cel
code_ext ends
end
```

Output:



```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...
C:\>cd DEBUG125
C:\DEBUG125>debug ..\P2-DRI~1.EXE
-g=0040
Unexpected breakpoint interrupt
AX=0060 BX=0009 CX=006E DX=0001 SP=0000 BP=0000 SI=0000 DI=0000
DS=0744 ES=0734 SS=0745 CS=0744 IP=005D OV UP EI PL NZ NA PO CY
0744:005D 0000          ADD     [BX+SI],AL          DS:0009=00
-d
0744:0000  CD 60 00 00 00 00 00 00-00 00 00 00 00 00 00 00  . . . . .
0744:0010  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  . . . . .
0744:0020  00 00 00 00 00 00 00 00-00 00 00 00 00 40 00 00  . . . . .
0744:0030  44 07 00 00 46 72 00 00-00 00 00 00 00 00 00 00  D...Fr.....
0744:0040  BB 44 07 8E D8 BB 45 07-8E D0 36 8B 26 28 00 33  .D...E...6.&(.3
0744:0050  C0 A0 00 00 9A 00 00 4A-07 A2 01 00 CC 00 00 00  . . . . .J.....
0744:0060  2D 20 00 BB 05 00 F6 E3-BB 09 00 F7 F3 CB EB 82  - . . . . .
0744:0070  3B E9 DD 04 BF 3C 01 57-8B D8 EB 87 EE 26 C7 06  ;....<.W.....&..
```

Task 3:

Write a program to find the 2's complement of a 16 bit number.

Driver Code:

```
extrn compliment:far

data segment public
    n dw 0abch
    answer dw ?
data ends

stack_seg segment stack
    dw 20 dup(0)
    top label word
stack_seg ends

code segment
assume cs:code, ds:data, ss:stack_seg
    mov ax,data
    mov ds,ax
```

```

    mov ax,stack_seg
    mov ss,ax
    mov sp,top
    xor ax,ax
    mov ax,n
    call compliment
    mov answer,ax
    int 03h
code ends
end

```

External File Code :

```

public compliment

code_ext segment
assume cs:code_ext
proc compliment far
    cmp ax,0000h
    jz stop
    not ax
    add ax,0001h
stop:
    ret
endp compliment
code_ext ends
end

```

Output:

```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...
C:\>cd DEBUG125
C:\DEBUG125>debug ..\P3-DRI~1.EXE
-g=0040
Unexpected breakpoint interrupt
AX=F544 BX=0000 CX=006B DX=0000 SP=0000 BP=0000 SI=0000 DI=0000
DS=0744 ES=0734 SS=0745 CS=0744 IP=005D NU UP EI NG NZ NA PE NC
0744:005D 0000          ADD     [BX+SI],AL          DS:0000=BC
-d
0744:0000  BC 0A 44 F5 00 00 00 00-00 00 00 00 00 00 00 00 ..D.....
0744:0010  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 .....
0744:0020  00 00 00 00 00 00 00 00-00 00 00 00 40 00 00 00 .....@...
0744:0030  44 07 00 00 46 72 00 00-00 00 00 00 00 00 00 00 D...Fr.....
0744:0040  B8 44 07 8E D8 B8 45 07-8E D0 36 8B 26 28 00 33 .D...E...6.&(.3
0744:0050  C0 A1 00 00 9A 00 00 4A-07 A3 02 00 CC 00 00 00 .....J.....
0744:0060  3D 00 00 74 05 F7 D0 05-01 00 CB E8 43 3B E8 82 =..t.....C:...
0744:0070  3B E9 DD 04 BF 3C 01 57-8B D8 E8 87 EE 26 C7 06 ;....<.W.....&..
-S
```

Nevil Parmar

CE-092

<https://nevilparmar.me>