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Section: A1

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Year: UG2

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ASSIGNMENT 4

1.Write an Assembly Language Program to add 3 X 3 matrices. Assume the matrices are stored in the form of lists (row wise). First matrix is stored from DS:0030H and the second matrix is stored from DS:0040.Store the result of the addition in the third lists starting from DS:0050H.

Code:

```
.model small
.stack 100h
.data
.code

main proc
mov ax,@data
mov es,ax
mov ds, ax
mov si,0030h
mov di,0040h
mov bx,0050h
mov cx,0009h

l1:
    mov al,[si]
    add al,[di]
    mov [bx],al
    inc di
```

```
        inc bx

        inc si

        loop l1

int 03h

mov ah,4ch

int 21h

main endp

end main
```


2.Write an Assembly Language Program to convert an eight bit binary number stored in DS:0030H into its equivalent BCD number. Stored the result in DS:0040H.

```
.model small

.stack 100h

.data

.code


main proc

mov ax,@data
```

```asm
mov ds,ax
mov ax,0000h
mov dx,0000h
mov si,0030h
mov cl,[si]
l2:
        cmp cl,00h
        jz l1
        dec cl
        MOV AL,DL
        add al,01h
        daa
        mov dl,al
        mov al,dh
        adc al,00h
        daa
        mov dh,al
jmp l2

l1:
        mov si,0040h
        mov [si],dx

int 03h
mov ah,4ch
int 21h
main endp
end main
```

```
        0 Severe  Errors

C:\>link a5q2.obj;

Microsoft (R) Overlay Linker  Version 3.60
Copyright (C) Microsoft Corp 1983-1987.  All rights reserved.


C:\>debug a5q2.exe
-t

AX=076E  BX=0000  CX=0043  DX=0000  SP=0100  BP=0000  SI=0000  DI=0000
DS=075A  ES=075A  SS=076F  CS=076A  IP=0013    NV UP EI PL NZ NA PO NC
076A:0013 8EC0            MOV     ES,AX
-e 076e:0030
076E:0030  C4.ff

-g=0000

AX=0002  BX=0000  CX=0000  DX=0255  SP=0100  BP=0000  SI=0040  DI=0000
DS=076E  ES=076E  SS=076F  CS=076A  IP=003E    NV UP EI PL ZR NA PE NC
076A:003E CC              INT     3
-d 076e:0040,0041
076E:0040  55 02                                              U.
-
```
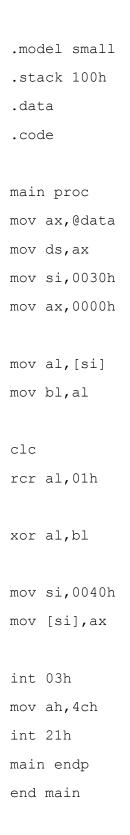
3.Write an Assembly program to convert a BCD number stored in DS:0030H into its equivalent hexadecimal number. Stored the result in DS:0040H.

```
.model small

.stack 100h

.data

.code


main proc

mov ax,@data

mov ds,ax

mov si,0030h

mov al,[si]

mov bl,al

AND AL,0F0H

mov cl,04h
```

```asm
        ror al,cl

        mov dl,0Ah

        mul dl

        mov dx,ax

        mov al,bl

        and al,0fh

        mov ah,00h

        add ax,dx

        mov si,0040h

        mov [si],ax


        int 03h

        mov ah,4ch

        int 21h

main endp

end main
```


DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: DEBUG

```
C:\>debug a5q3.exe
-t

AX=076D  BX=0000  CX=003A  DX=0000  SP=0100  BP=0000  SI=0000  DI=0000
DS=075A  ES=075A  SS=076E  CS=076A  IP=0013    NV UP EI PL NZ NA PO NC
076A:0013 8ED8              MOV     DS,AX
-e 076d:0030
076D:0030  E4.96

-g=0000

AX=0060  BX=0096  CX=0004  DX=005A  SP=0100  BP=0000  SI=0030  DI=0040
DS=076D  ES=075A  SS=076E  CS=076A  IP=0035    NV UP EI PL NZ AC PE NC
076A:0035 CC                INT     3
-d 076d:0040
076D:0040  60 00 50 8D 86 FA FE 50-E8 17 73 83 C4 06 8B B6   `.P....P..s.....
076D:0050  FA FE 81 E6 FF 00 C6 82-FB FE 00 2B C0 50 8D 86   ...........+.P..
076D:0060  FB FE 50 E8 08 6A 83 C4-04 0B C0 75 03 E9 A5 00   ..P..j.....u....
076D:0070  C7 86 7A FF 00 00 EB 04-FF 86 7A FF A1 70 08 39   ..z.......z..p.9
076D:0080  86 7A FF 72 03 E9 8D 00-8A 86 FA FE 2A E4 40 50   .z.r........*.@P
076D:0090  8D 86 FA FE 50 8D 86 7C-FF 50 E8 C5 72 83 C4 06   ....P..¦.P..r...
076D:00A0  8B 9E 7A FF D1 E3 D1 E3-8B 87 CC 17 8B 97 CE 17   ..z.............
076D:00B0  89 46 FC 89 56 FE 05 0C-00 52 50 E8 42 48 83 C4   .F..V....RP.BH..
_
```

4.Write an Assembly program to convert a binary number stored in DS:0030H into its equivalent gray code. Stored the result in DS:0040H.

```asm
.model small

.stack 100h

.data

.code


main proc

mov ax,@data

mov ds,ax

mov si,0030h

mov ax,0000h


mov al,[si]

mov bl,al


clc

rcr al,01h


xor al,bl


mov si,0040h

mov [si],ax


int 03h

mov ah,4ch

int 21h

main endp

end main
```

```
DOSBox 0.74-3, Cpu speed:    3000 cycles, Frameskip  0, Program:   DEBUG                    —    □    ✕

C:\>debug a5q4.exe
-t

AX=076C   BX=0000   CX=002B   DX=0000   SP=0100   BP=0000   SI=0000   DI=0000
DS=075A   ES=075A   SS=076D   CS=076A   IP=0013     NU UP EI PL NZ NA PO NC
076A:0013 8ED8              MOV      DS,AX
-e 076c:0030
076C:0030   3D.10    FF.10    FF.

-g=0000

AX=0718   BX=0000   CX=002B   DX=0010   SP=0100   BP=0000   SI=0030   DI=0040
DS=076C   ES=075A   SS=076D   CS=076A   IP=0026     NU UP EI PL NZ NA PE NC
076A:0026 CC                 INT      3
-d 076c:0040
076C:0040   18 40 50 8B C3 8C C2 05-0C 00 52 50 E8 C1 48 83    .@P.......RP..H.
076C:0050   C4 04 50 8D 86 FA FE 50-E8 17 73 83 C4 06 8B B6    ..P....P..s.....
076C:0060   FA FE 81 E6 FF 00 C6 82-FB FE 00 2B C0 50 8D 86    ...........+.P..
076C:0070   FB FE 50 E8 08 6A 83 C4-04 0B C0 75 03 E9 A5 00    ..P..j.....u....
076C:0080   C7 86 7A FF 00 00 EB 04-FF 86 7A FF A1 70 08 39    ..z.......z..p.9
076C:0090   86 7A FF 72 03 E9 8D 00-8A 86 FA FE 2A E4 40 50    .z.r........*.@P
076C:00A0   8D 86 FA FE 50 8D 86 7C-FF 50 E8 C5 72 83 C4 06    ....P..|.P..r...
076C:00B0   8B 9E 7A FF D1 E3 D1 E3-8B 87 CC 17 8B 97 CE 17    ..z.............
-
```

5. Write an Assembly program to find the factorial of a number stored in DS:0030H. Stored the result in DS:0040H.

```
.model small
.stack 100h
.data
.code

main proc
mov ax,@data
mov ds,ax
mov ax,0000h
mov bx,0000h
mov cx,0001h
mov si,0030h
mov bl,[si]
mov al,bl
```

```asm
l2:
    cmp bl,00h
    jz l1
    dec bl
    cmp bl,00h
    jz l1
    MUL BX
    mov cx,ax
jmp l2

l1:
    mov si,0040h
    mov [si],cx

int 03h
mov ah,4ch
int 21h
main endp
end main
```