ASM-LAB
Assignment 4

NAME : Swarnendu Banerjee

ROLL : 002311001016

DEPARTMENT : IT – A1

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 ds, ax
;mov es, ax

mov si, 0030h
mov bx, 0040h
mov di, 0050h
mov cx, 0009h

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

int 03h
mov ah, 4ch
int 21h

main endp
end main
```

Output

```
C:\>debug a4q1.exe
-t

AX=076C  BX=0000  CX=0021  DX=0000  SP=0100  BP=0000  SI=0000  DI=0000
DS=075A  ES=075A  SS=076D  CS=076A  IP=0003   NV UP EI PL NZ NA PO NC
076A:0003 8ED8          MOV     DS,AX
-e 076c:0030
076C:0030  3D.1    FF.2    FF.3    74.4    03.5    E9.6    ED.7    00.8
076C:0038  C4.9

-e 076c:0040
076C:0040  E4.1    40.2    50.3    8B.4    C3.5    8C.6    C2.7    05.8
076C:0048  0C.9

-g=0000

AX=0712  BX=0049  CX=0000  DX=0000  SP=0100  BP=0000  SI=0039  DI=0059
DS=076C  ES=075A  SS=076D  CS=076A  IP=001C   NV UP EI PL NZ NA PO NC
076A:001C CC            INT     3
-d 076c:0050,0059
076C:0050  02 04 06 08 0A 0C 0E 10-12 17                         ..........
```

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.

   Code

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

main proc

mov ax, @data
mov ds, ax

mov si, 0030h
mov bl, [si]
mov ax, 0000h
mov dx, 0000h

cmp bl, 00h
jz l2

l1:
add ax, 01h
daa
adc dl, 00h
```

```
dec bl
cmp bl, 00h
jnz l1

l2: mov si, 0040h
mov [si], dl
inc si
mov [si], ax

int 03h
mov ah, 4ch
int 21h

main endp
end main
```

Output:

```
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=0003   NV UP EI PL NZ NA PO NC
076A:0003 8ED8          MOV     DS,AX
-e 076c:0030
076C:0030  3D.ff

-g=0000

AX=0055  BX=0000  CX=002B  DX=0002  SP=0100  BP=0000  SI=0041  DI=0000
DS=076C  ES=075A  SS=076D  CS=076A  IP=0026   NV UP EI PL NZ NA PE NC
076A:0026 CC            INT     3
-d 076c:0040,0041
076C:0040  02 55                                            .U
-e 076c:0030
076C:0030  FF.a4

-g=0000

AX=0064  BX=0000  CX=002B  DX=0001  SP=0100  BP=0000  SI=0041  DI=0000
DS=076C  ES=075A  SS=076D  CS=076A  IP=0026   NV UP EI PL NZ NA PE NC
076A:0026 CC            INT     3
-d 076c:0040,0041
076C:0040  01 64                                            .d
```

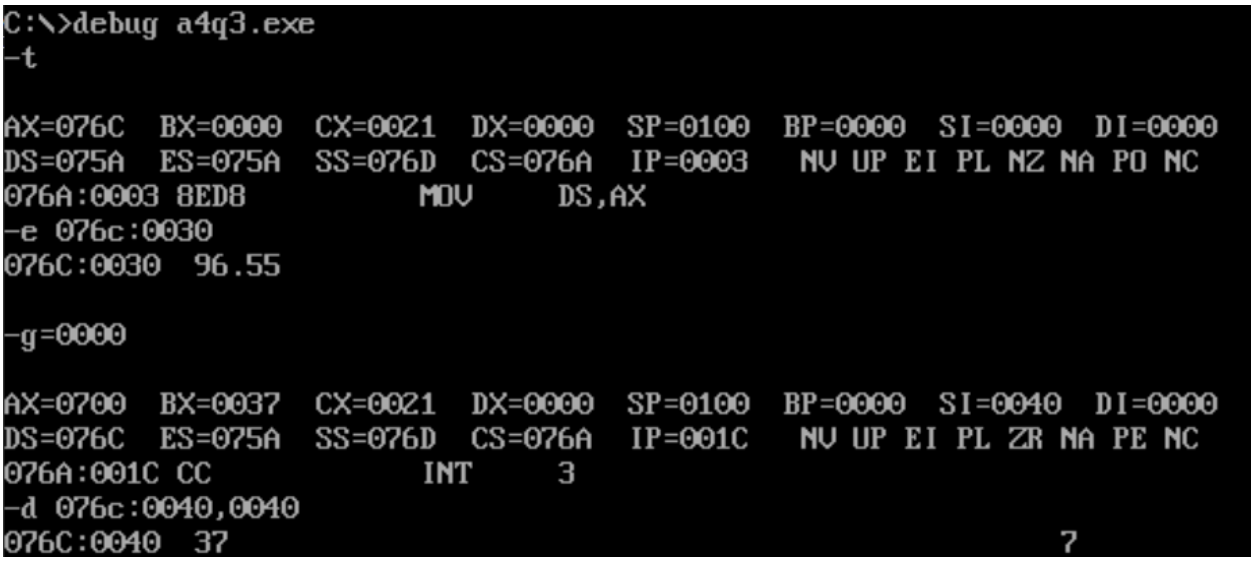
3. Write an Assembly program to convert a BCD number stored in DS:0030H into its equivalent hexadecimal number. Stored the result in DS:0040H.

Code:

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

```
.code

main proc

mov ax, @data
mov ds, ax

mov si, 0030h
mov al, [si]
mov bl, 00h

cmp al, 00h
jz l2

l1: sub al, 01h
das
inc bl
cmp al, 00h
jz l2
jmp l1

l2: mov si, 0040h
mov [si], bl

int 03h
mov ah, 4ch
int 21h

main endp
end main
```

Output:

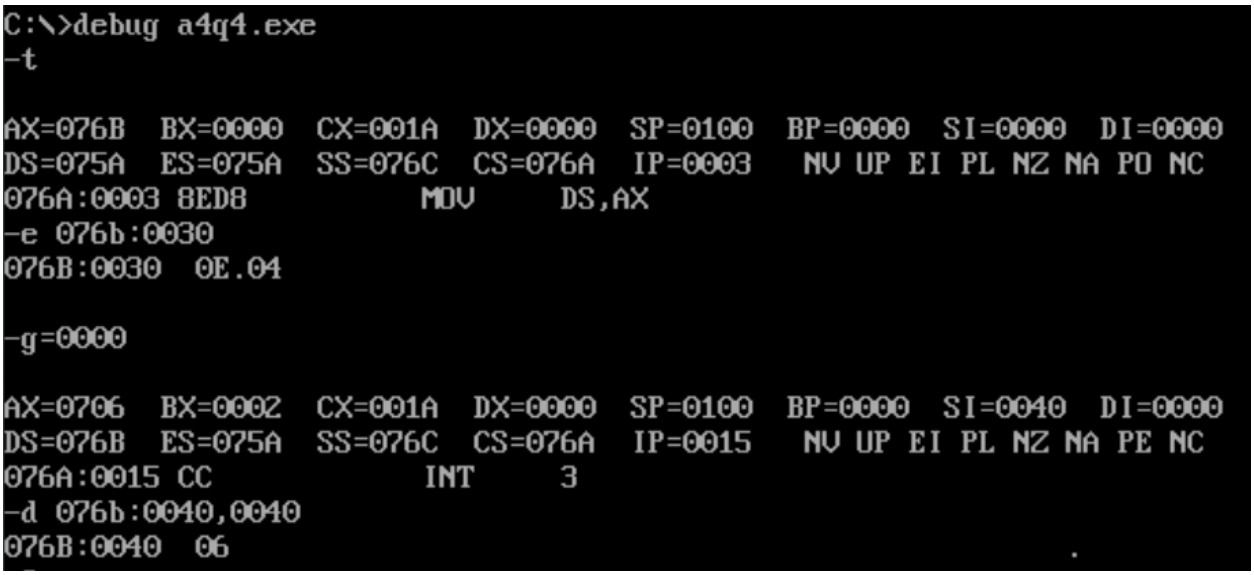


4. Write an Assembly program to convert a binary number stored in DS:0030H into its equivalent gray code. Stored the result in DS:0040H.

   Code:

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

main proc

mov ax, @data
mov ds, ax

mov si, 0030h
mov al, [si]
mov bl, al
ror bl, 01h
xor al, bl

mov si, 0040h
mov [si], al

int 03h
mov ah, 4ch
int 21h

main endp
end main
```

Output:



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

Code:

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

main proc

mov ax, @data
mov ds, ax

mov si, 0030h
mov bl, [si]
mov bh, 00h
mov ax, 0001h

cmp bl, 00h
jz l2

cmp bl, 01h
jz l2

l1:
```

```
mul bx
dec bl
cmp bl, 01h
jz l2
jmp l1

l2: mov si, 0040h
mov [si], dh
inc si
mov [si], dl
inc si
mov [si], ah
inc si
mov [si], al

int 03h
mov ah, 4ch
int 21h

main endp
end main
```

Output: