Practical – 5

Problem Statement: Write an X86/64 ALP to count number of positive and negative numbers from the array.

Program:

```
section .data
welmsg db 10,'Welcome to count +ve and -ve numbers in an array',10
welmsg_len equ $-welmsg
pmsg db 10,'Count of +ve numbers::'
pmsg_len equ $-pmsg
nmsg db 10,'Count of -ve numbers::'
nmsg_len equ $-nmsg
nwline db 10
array dw 8505h,90ffh,0087h,0088h,8a9fh,00adh,0002h
arrcnt equ 7
pcnt db 0
ncnt db 0
section .bss
dispbuff resb 2
%macro print 2
mov rax, 1
mov rdi, 1
mov rsi, %1
mov rdx, %2
syscall
%endmacro
section .text
```

```
global _start
_start:
print welmsg,welmsg_len
mov rsi,array
mov rcx,arrcnt
up1:
bt word[rsi],15
jnc pnxt
inc byte[ncnt]
jmp pskip
pnxt: inc byte[pcnt]
pskip: inc rsi
inc rsi
loop up1
print pmsg,pmsg_len
mov bl,[pcnt]
call disp8num
print nmsg,nmsg_len
mov bl,[ncnt]
call disp8num
print nwline,1 ;New line char
exit:
mov rax,60
mov rdi,0
syscall
disp8num:
```

```
mov rcx,2 ;Number digits to display
mov rdi,dispbuff ;Temp buffer
dup1:
rol bl,4 ;Rotate number from bl to get MS digit to LS digit
mov al,bl ;Move rotated number to AL
and al,0fh ;Mask upper digit
cmp al,09 ;Compare with 9
jbe dskip ;If number below or equal to 9 go to add only 30h
add al,07h ;Else first add 07h
dskip: add al,30h ;Add 30hWrite an ALP to count no. of positive and
negative numbers from the array.
mov [edi],al ;Store ASCII code in temp buff
inc rdi ;Increment pointer to next location in temp buff
loop dup1 ;repeat till ecx becomes zero
print dispbuff,2 ;display the value from temp buff
ret ;return to calling program
```

Output:

```
atharva@atharva:~$ gedit lab5.asm
atharva@atharva:~$ nasm -f elf64 lab5.asm
atharva@atharva:~$ ld -o lab5 lab5.o
atharva@atharva:~$ ./lab5
Welcome to count +ve and -ve numbers in an array
Count of +ve numbers::04
Count of -ve numbers::03
```