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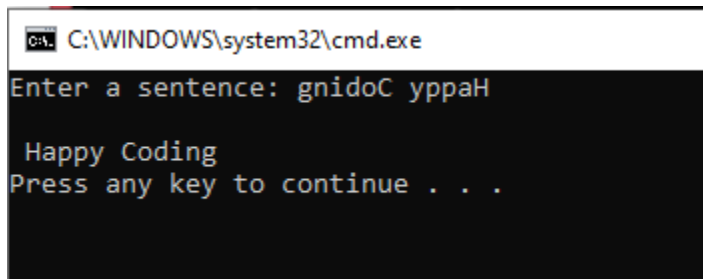
LAB 12 Tasks

Task 1:

Code:

```
INCLUDE Irvine32.inc
.data
msg1 BYTE 15 DUP (?)
msg2 BYTE "Enter a sentence: ",0
.code
main PROC
    mov edx, OFFSET msg2
    call WriteString
    mov edx, OFFSET msg1
    mov ecx, LENGTHOF msg1
    call ReadString
    mov esi, 0
    mov ecx, LENGTHOF msg1
l1:
    mov eax, DWORD PTR msg1[esi*TYPE msg1]
    PUSH eax
    INC esi
    Loop l1
    mov ecx, LENGTHOF msg1
l2:
    POP eax
    call WriteChar
    Loop l2
    call crlf
    exit
main ENDP
END main
```

Screenshot:



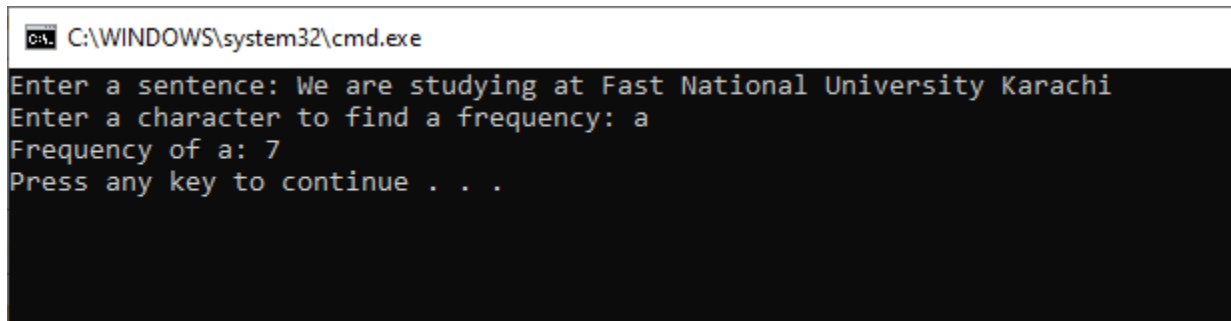
Task: 2

Code:

```
INCLUDE Irvine32.inc
.data
msg6 BYTE ": ",0
count BYTE 0
msg5 BYTE "Frequency of ",0
msg1 BYTE 55 DUP (?)
msg2 BYTE "Enter a sentence: ",0
msg3 BYTE "Enter a character to find a frequency: ",0
msg4 BYTE ?
.code
main PROC
mov edx, OFFSET msg2
call WriteString
mov edx, OFFSET msg1
mov ecx, LENGTHOF msg1
call ReadString
mov edx, OFFSET msg3
call WriteString
mov edx, OFFSET msg4
call ReadString
mov edi, OFFSET msg1
mov al, msg4
mov ecx, LENGTHOF msg1
cld
L1:
    SCASB
    jnz n_eq
    INC count
n_eq:
Loop L1

mov edx, OFFSET msg5
call WriteString
mov edx, OFFSET msg4
call WriteString
mov edx, OFFSET msg6
call WriteString
mov al, count
call WriteDec
call crlf
exit
main ENDP
END main
```

Screenshot:



```
C:\WINDOWS\system32\cmd.exe
Enter a sentence: We are studying at Fast National University Karachi
Enter a character to find a frequency: a
Frequency of a: 7
Press any key to continue . . .
```

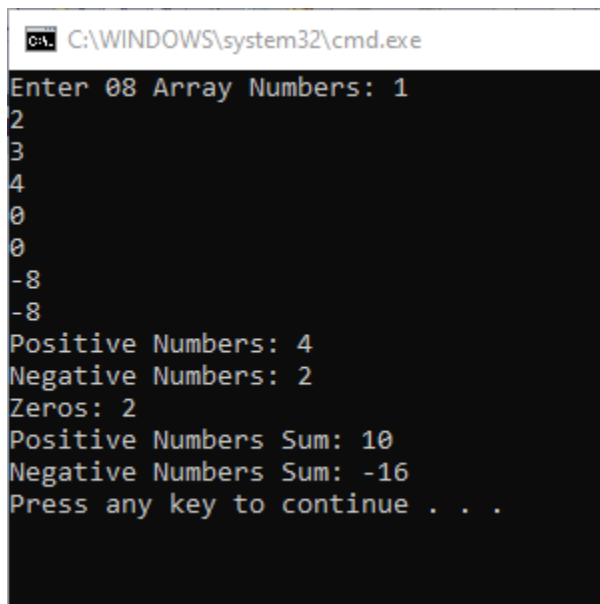
Task 3:

Code:

```
INCLUDE Irvine32.inc
.data
count DWORD 8
array DWORD 8 DUP (?)
msg1 BYTE "Positive Numbers: ",0
msg2 BYTE "Negative Numbers: ",0
msg3 BYTE "Positive Numbers Sum: ",0
msg4 BYTE "Negative Numbers Sum: ",0
msg5 BYTE "Zeros: ",0
msg6 BYTE "Enter 08 Array Numbers: ",0
pos DWORD 0
nega DWORD 0
posSum DWORD 0
negSum DWORD 0
zero DWORD 0
.code
main PROC
mov eax, 0
mov ebx, 0
mov edx, OFFSET msg6
call WriteString
mov esi, 0
mov ecx, count
l1:
    call ReadInt
    mov array[esi*TYPE array], eax
    INC esi
    mov eax, 0
Loop l1
mov esi, 0
mov ecx, count
l2:
    mov eax, array[esi*TYPE array]
    INC esi
    cmp eax, 0
    je z
    jg gr
    INC nega
    add negSum, eax
    jmp done
z:
    INC zero
    jmp done
gr:
    INC pos
    add posSum, eax
done:
    mov eax, 0
Loop l2
mov edx, OFFSET msg1
call WriteString
mov eax, pos
call WriteDec
```

```
call crlf
mov edx, OFFSET msg2
call WriteString
mov eax, nega
call WriteDec
call crlf
mov edx, OFFSET msg5
call WriteString
mov eax, zero
call WriteDec
call crlf
mov edx, OFFSET msg3
call WriteString
mov eax, posSum
call WriteDec
call crlf
mov edx, OFFSET msg4
call WriteString
mov eax, 0
mov eax, negSum
call WriteInt
call crlf
exit
main ENDP
END main
```

Screenshot:



```
C:\WINDOWS\system32\cmd.exe
Enter 08 Array Numbers: 1
2
3
4
0
0
-8
-8
Positive Numbers: 4
Negative Numbers: 2
Zeros: 2
Positive Numbers Sum: 10
Negative Numbers Sum: -16
Press any key to continue . . .
```

Task: 4

Code:

```
INCLUDE Irvine32.inc
.data
array2D BYTE 10h,20h,30h,40h
          RowSize = ($-array2D)
          BYTE 60h,70h,80h,90h
          BYTE 0B0h,0C0h,0D0h,0E0h

.code
main PROC
mov ecx, 3
mov ebx, OFFSET array2D
mov esi, 0
mov eax, 0
L1:
    PUSH ecx
    mov ecx, RowSize
    l2:
        mov al, [ebx+esi]
        call WriteDec
        mov eax, ','
        call WriteChar
        INC esi
    Loop l2
    POP ecx
    call crlf
Loop L1
call crlf
exit
main ENDP
END main
```

Screenshot:

