

# Assembly Language LAB

*Islamic University – Gaza*

*Engineering Faculty*

*Department of Computer Engineering*

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*ECOM 2125: Assembly Language LAB*

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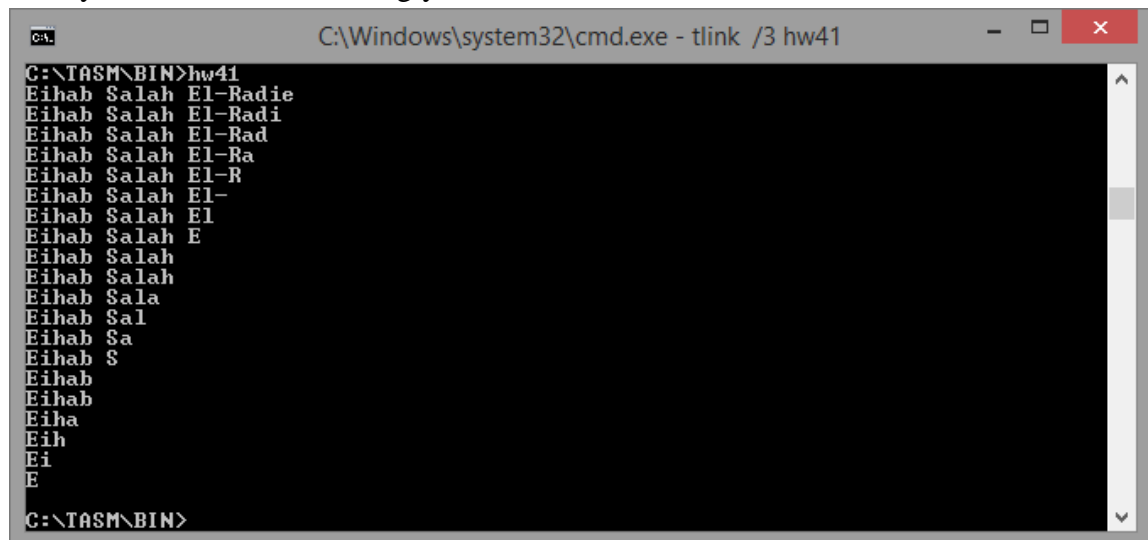
## *Lab # 4*

### *Loop Instruction*

### *HW Solution*

## Homework:

1. Write an assembly language program using the Loop instruction to print all letters of your full name decreasingly as follows:



```
C:\Windows\system32\cmd.exe - tlink /3 hw41
C:\TASM\BIN>hw41
Eihab Salah El-Radie
Eihab Salah El-Radi
Eihab Salah El-Rad
Eihab Salah El-Ra
Eihab Salah El-R
Eihab Salah El-
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C:\TASM\BIN>
```

## Solution:

```
.model small
.386
.stack 100h
.data
eihab db 'Eihab Salah El-Radie'
newLine db 0Ah,0Dh,'$',
count dd 20
. code
main:
    mov ax,@data
    mov ds,ax
    mov ecx,20 ; set outer loop count L1

L1:
    mov ebx,ecx ;save outer loop count
    mov ecx,count ; set inner loop count L2
    mov esi, offset eihab

L2: ;print your name characters as a row
    mov ah,02h
    mov dl, [esi]
    int 21h

    inc esi
    loop L2 ;repeat the inner loop

    mov ecx,ebx ; restore outer loop count L1

    mov ah,02h
    mov dl, newLine
    int 21h

    dec count
    loop L1 ;repeat the outer loop

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

2. Using loop, Use the array odd to find the square of the numbers between 1 and 5 and put the square of each number in the array square:

```
odd db 1,3,5,7,9
square db 5 dup(?)
```

***Solution:***

```
.model small
.386
.stack 100h
.data
odd db 1,3,5,7,9
square db 5 dup(?)
.code
main:
    mov ax,@data
    mov ds,ax

    mov esi, offset odd
    mov edi, offset square
    mov ecx, 5
    mov al,0
L:
    add al,[esi]
    mov [edi],al    ; 1 = 1*1

    inc esi
    inc edi
Loop L

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

3. Rewrite Exercise 1 (Fibonacci number sequence) with just 2 add instructions and without PTR Operator.

*Solution:*

```
.model small
.386
.stack 100h
.data
Fibonacci db 1h,1h,5 dup(?)
.code
main:
    mov ax,@data
    mov ds,ax

    mov ecx,5
    mov esi, offset Fibonacci
L:
    mov bl,0
    add bl,[esi]
    add bl,[esi+1]
    mov [esi+2],bl

    inc esi
    loop L

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

4. Rewrite Exercise 1 (Fibonacci number sequence) with just 2 add instructions and without PTR and OFFSET Operators.

***Solution:***

```
.model small
.386
.stack 100h
.data
Fibonacci db 1h,1h,5 dup(?)
.code
main:
    mov ax,@data
    mov ds,ax

    mov ecx,5
    mov esi, 0
L:
    mov bl,0
    add bl,[Fibonacci+esi]
    add bl,[Fibonacci+esi+1]
    mov [Fibonacci+esi+2],bl

    inc esi
    loop L

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