Computer Organization and Assembly Language

Lab 6

Student Name	Umamah Hussain
Roll Number	21L-1858
Instructor	Hazoor Ahmad
Class	CS3
Section	A1
Semester	Fall 2022

Fast School of Computing

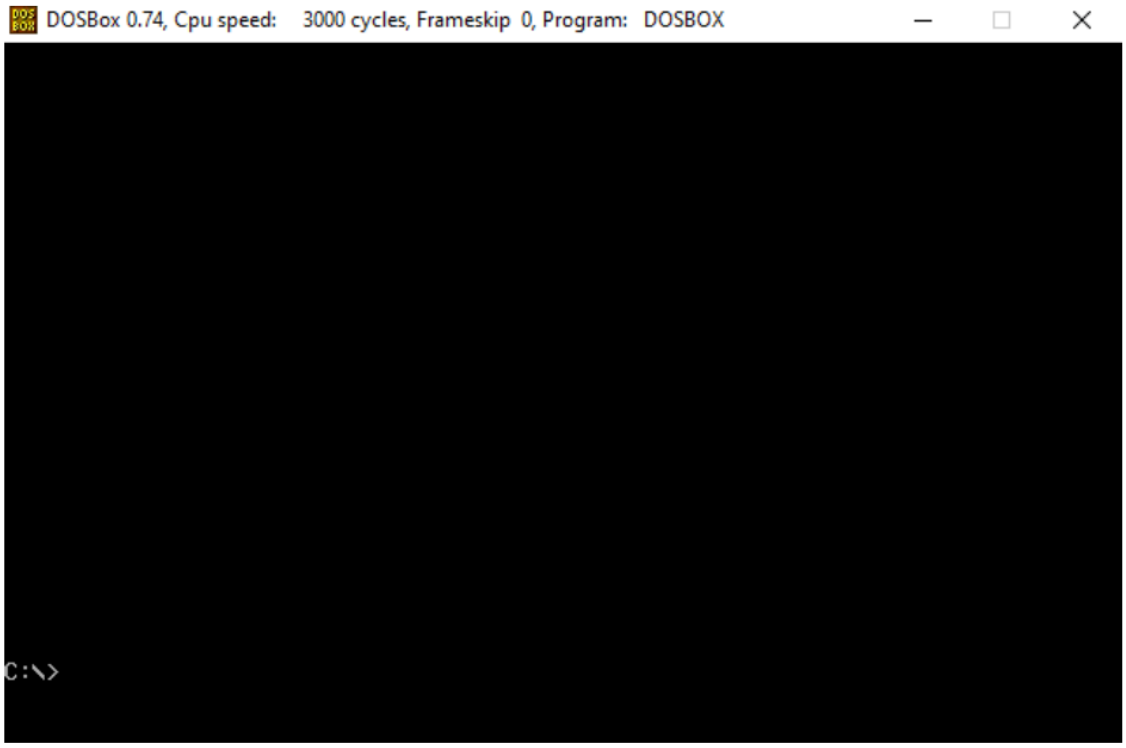
FAST-NU, Lahore, Pakistan

Activity 1:

Assembly Language Code

```
1  [org 0x100]
2  call clearscreen
3  mov ax, 0x4c00
4  int 21h
5  clearscreen: push es
6  push ax
7  push di
8  mov ax, 0xb800
9  mov es, ax
10 mov di, 0
11 nextchar: mov word [es:di], 0x0720
12 add di, 2
13 cmp di, 4000
14 jne nextchar
15 pop di
16 pop ax
17 pop es
18 ret
19
```

Debugging Screenshots



Activity 2

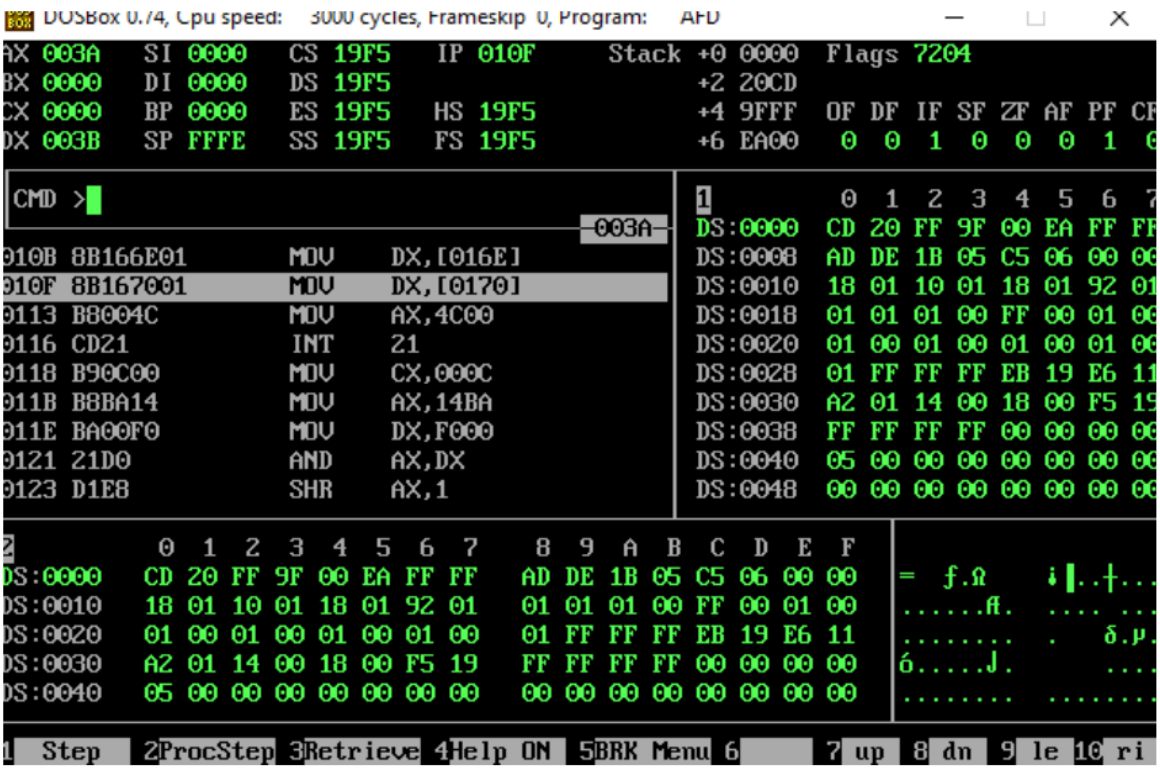
Assembly Language Code

```
[org 0x100]
call ascii_convert
mov dx, [n1]
mov dx, [n2]
mov dx, [n3]
mov dx, [n4]
mov ax, 0x4c00
int 21h
ascii_convert:
mov cx, 12
mov ax, 5306
mov dx, 0xf000
and ax, dx
l1:shr ax, 1
loop l1
add ax, 0x30
mov [n1], ax
mov cx, 8
mov ax, 5306
mov dx, 0x0f00
```

```
and ax, dx
l2:shr ax, 1
loop l2
add ax, 0x30
mov [n2], ax
mov cx, 4
mov ax, 5306
mov dx, 0x00f0
and ax, dx
l3:shr ax, 1
loop l3
add ax, 0x30
mov [n3], ax
mov ax, 5306
mov dx, 0x000f
and ax, dx
add ax, 0x30
mov [n4], ax
end:ret
temp: db 10, 100, 1000, 10000
n1: dw 0
n2: dw 0
```

```
n3: dw 0
n4: dw 0
```

Debugging Screenshots



Activity 3:

Assembly Language Code

```
[org 0x100]
call clearscreen
call ascii_convert
```

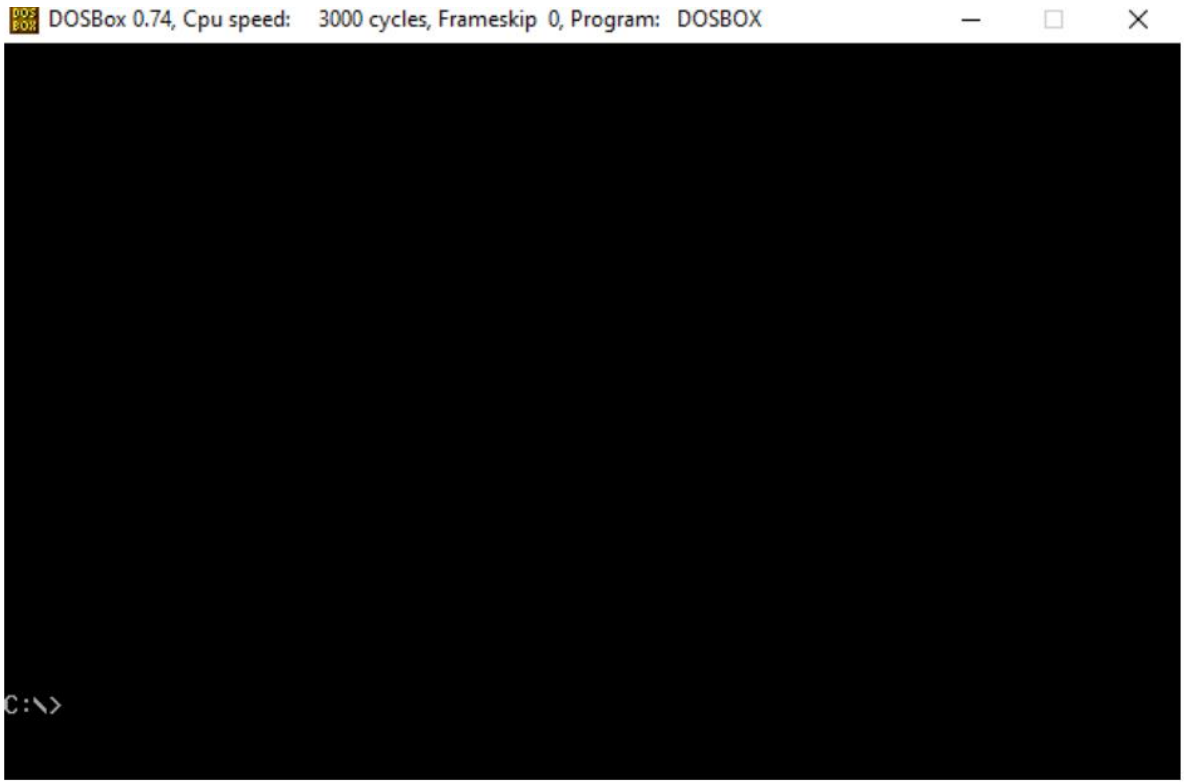
```
mov ax, string
push ax
push word [length]
call printstr
mov ax, 0x4c00
int 21h
clearscreen: push es
push ax
push di
mov ax, 0xb800
mov es, ax
mov di, 0
nextchar: mov word [es:di], 0x0720
add di, 2
cmp di, 4000
jne nextchar
pop di
pop ax
pop es
ret
ascii_convert:
mov cx, 12
```

```
mov ax, 5306
mov dx, 0xf000
and ax, dx
l1:shr ax, 1
loop l1
add ax, 0x30
mov [n1], ax
mov cx, 8
mov ax, 5306
mov dx, 0x0f00
and ax, dx
l2:shr ax, 1
loop l2
add ax, 0x30
mov [n2], ax
mov cx, 4
mov ax, 5306
mov dx, 0x00f0
and ax, dx
l3:shr ax, 1
loop l3
add ax, 0x30
```

```
mov [n3], ax
mov ax, 5306
mov dx, 0x000f
and ax, dx
add ax, 0x30
mov [n4], ax
end:ret
printstr: push bp
mov bp, sp
push es
push ax
push cx
push si
push di
mov ax, 0xb800
mov es, ax
mov di, 0
mov si, [bp+6]
mov cx, [bp+4]
mov ah, 0x07
next: mov al, [si]
mov [es:di], ax
```

```
add di, 2
add si, 1
loop nex
pop di
pop si
pop cx
pop ax
pop es
pop bp
ret 4
string: db "Umamah Hussain - 21l-1858"
length: db 22
n1: dw 0
n2: dw 0
n3: dw 0
n4: dw 0
```

Debugging Screenshots



Activity 4

Assembly Language Code

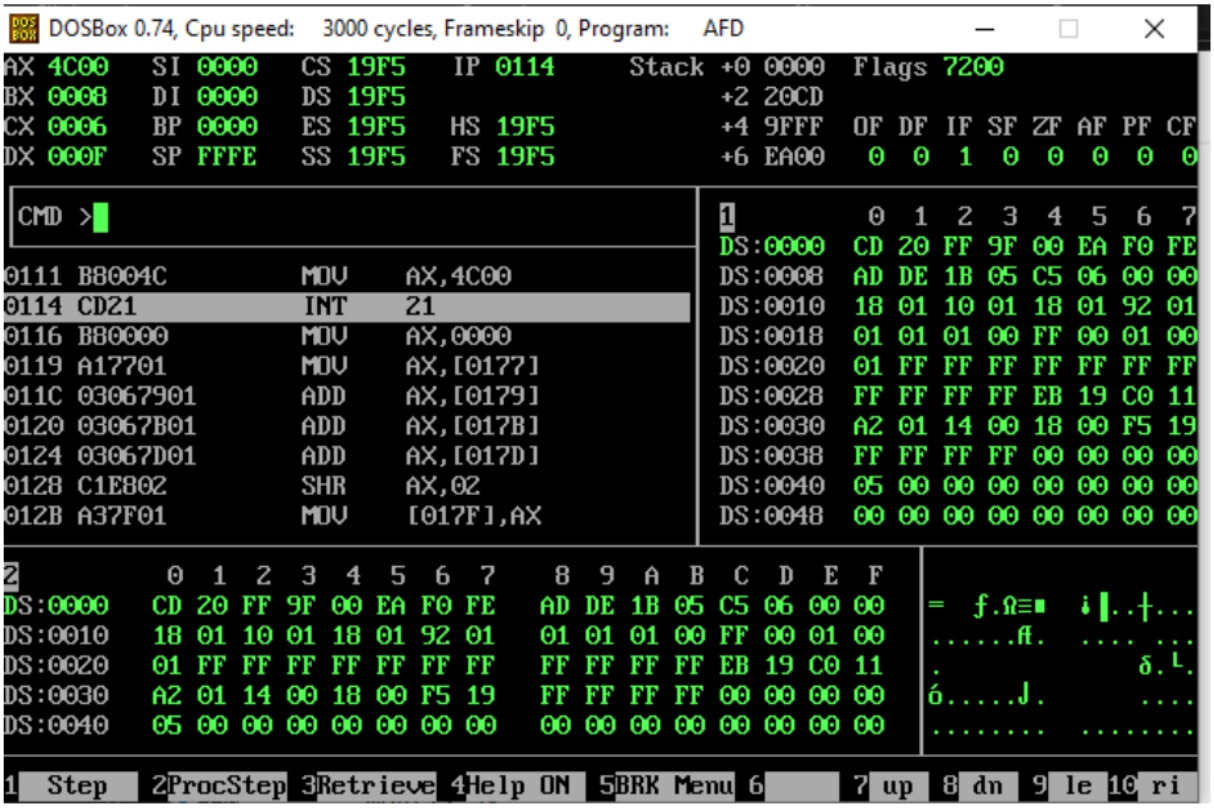
```
[org 0x0100]
mov ax , 0x5306
call seperate
call summation
mov cx, [r]
mov bx, [l]
mov ax,0x4c00
```

```
int 21h
summation:
mov ax, 0
mov ax, [n1]
add ax, [n2]
add ax, [n3]
add ax, [n4]
shr ax , 2
mov[r],ax
add ax , 2
mov[l],ax
ret
seperate:
mov cx, 12
mov ax, 5306
mov dx, 0xf000
and ax, dx
l1:shr ax, 1
loop l1
mov [n1], ax
mov cx, 8
mov ax, 5306
```

```
mov dx, 0x0f00
and ax, dx
l2:shr ax, 1
loop l2
mov [n2], ax
mov cx, 4
mov ax, 5306
mov dx, 0x00f0
and ax, dx
l3:shr ax, 1
loop l3
mov [n3], ax
mov ax, 5306
mov dx, 0x000f
and ax, dx
mov [n4], ax
end:ret
n1: dw 0
n2: dw 0
n3: dw 0
n4: dw 0
r: dw 0
```

```
l: dw 0
```

Debugging Screenshots



Activity 5

Assembly Language Code

```
[org ox100]
mov ax , 0x5306
call seperate
call summation
```

```
mov ax, 0x4c00
int 21h
summation:
mov ax, 0
mov ax, [n1]
add ax, [n2]
add ax, [n3]
add ax, [n4]
shr ax , 2
mov[r],ax
add ax , 2
mov[l],ax
ret
seperate:
mov cx, 12
mov ax, 5306
mov dx, 0xf000
and ax, dx
l1:shr ax, 1
loop l1
mov [n1], ax
mov cx, 8
```

```
mov ax, 5306
mov dx, 0x0f00
and ax, dx
l2:shr ax, 1
loop l2
mov [n2], ax
mov cx, 4
mov ax, 5306
mov dx, 0x00f0
and ax, dx
l3:shr ax, 1
loop l3
mov [n3], ax
mov ax, 5306
mov dx, 0x000f
and ax, dx
mov [n4], ax
end:ret
addition:
mov ax, [f]
mov bx, word [result]
add bx, ax
```

```
mov [reres], bx
mov bx, word [result + 2]
mov ax, [f+2]
adc bx, ax
mov [reres + 2], bx
ret
n1: dw 0
n2: dw 0
n3: dw 0
n4: dw 0
r: dw 0
f: dd 0
```

Debugging Screenshots