COMPUTER ORGANIZATION AND ARCHITECTURE

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CLASS: CSE-F

LAB TASK 5

1. Write an assembly language program to perform division of 8-bit data.

CODE:

```
org 100h

; Initialize values
mov al,96h       ; Move 89h (137 in decimal) into AL
mov bl,10h       ; Move 10h (16 in decimal) into BL

; Perform division (AL / BL)
idiv bl          ; AL = quotient, AH = remainder
mov bl,al        ; Store quotient in BL
mov bh,ah        ; Store remainder in BH

; Convert first digit (quotient) to ASCII
and al,0f0h      ; Mask higher nibble of AL
shr al,4         ; Shift right 4 bits to get the first hex digit
add al,30h       ; Convert to ASCII (0-9)
cmp al,39h       ; Check if it's a number or letter (0-9)
jle print_first_digit1
```

```
add al,7        ; Convert to ASCII (A-F)

print_first_digit1:
   mov dl,al    ; Move the result to DL (for printing)
   mov ah,02h   ; Print function
   int 21h      ; Interrupt to print the character

; Convert second digit (quotient) to ASCII
mov al,bl       ; Move the quotient back into AL
and al,0fh      ; Mask the lower nibble of AL
add al,30h      ; Convert to ASCII (0-9)
cmp al,39h      ; Check if it's a number or letter (0-9)
jle print_second_digit1
add al,7        ; Convert to ASCII (A-F)

print_second_digit1:
   mov dl,al    ; Move the result to DL (for printing)
   mov ah,02h   ; Print function
   int 21h      ; Interrupt to print the character

; Print remainder (remainder is in BH)

; Convert first digit (upper nibble of remainder) to ASCII
mov al,bh       ; Move remainder into AL
and al,0f0h     ; Mask the higher nibble
shr al,4        ; Shift right 4 bits to get the first hex digit
```

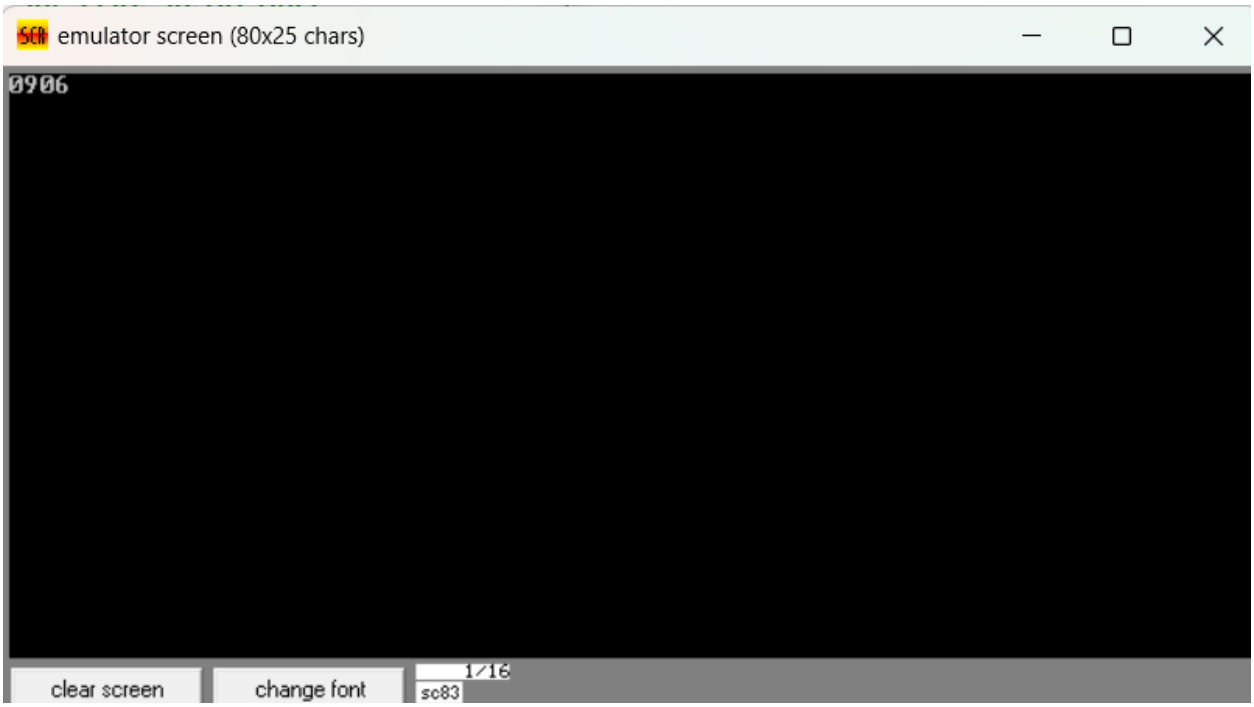
```
add al,30h      ; Convert to ASCII (0-9)
cmp al,39h      ; Check if it's a number or letter (0-9)
jle print_first_rem_digit
add al,7        ; Convert to ASCII (A-F)

print_first_rem_digit:
   mov dl,al    ; Move the result to DL (for printing)
   mov ah,02h   ; Print function
   int 21h      ; Interrupt to print the character

; Convert second digit (lower nibble of remainder) to ASCII
mov al,bh       ; Move remainder back into AL
and al,0fh      ; Mask the lower nibble
add al,30h      ; Convert to ASCII (0-9)
cmp al,39h      ; Check if it's a number or letter (0-9)
jle print_second_rem_digit
add al,7        ; Convert to ASCII (A-F)

print_second_rem_digit:
   mov dl,al    ; Move the result to DL (for printing)
   mov ah,02h   ; Print function
   int 21h      ; Interrupt to print the character
```

OUTPUT:



2. Write a program in assembly language to perform division of 16-bit data.

CODE:

```
Org 100h

mov ax,1780h

mov bx,1000h

div bx

 mov bx,ax

 mov cx,dx

 mov ah,ch

 and ah,0f0h

 shr ah,4
```

```
add ah,30h
cmp ah,39h
jle print_high_nibble32
add ah,7
print_high_nibble32:
  mov dl,ah
  mov ah,02h
  int 21h
mov ah,ch
and ah,0fh
add ah,30h
cmp ah,39h
jle print_low_nibble32
add ah,7
print_low_nibble32:
mov dl,ah
mov ah,02h
int 21h

mov ah,cl
and ah,0f0h
shr ah,4
add ah,30h
cmp ah,39h
jle print_low_nibble24
add ah,7
```

```
print_low_nibble24:
mov dl,ah
mov ah,02h
int 21h

mov ah,cl
and ah,0fh
add ah,30h
cmp ah,39h
jle print_high_nibble24:
add ah,7
print_high_nibble24:
mov dl,ah
mov ah,02h
int 21h


mov ah, bh
shr ah, 4
add ah, 30h
cmp ah, 39h
jle print_high_nibble
add ah, 7
print_high_nibble:
mov dl, ah
mov ah, 02h
```

```
int 21h

mov ah, bh
and ah, 0fh
add ah, 30h
cmp ah, 39h
jle print_low_nibble
add ah, 7
print_low_nibble:
mov dl, ah
mov ah, 02h
int 21h

mov ah, bl
shr ah, 4
add ah, 30h
cmp ah, 39h
jle print_high_nibble2
add ah, 7
print_high_nibble2:
mov dl, ah
mov ah, 02h
int 21h

mov ah, bl
and ah, 0fh
```

```
 add ah, 30h
 cmp ah, 39h
 jle print_low_nibble2
 add ah, 7
print_low_nibble2:
 mov dl, ah
 mov ah, 02h
 int 21h
 mov ah,4ch
 int 21h
```

OUTPUT:

GITHUB LINK: https://github.com/vishnupriyavayya/COA-LAB-TASK-5