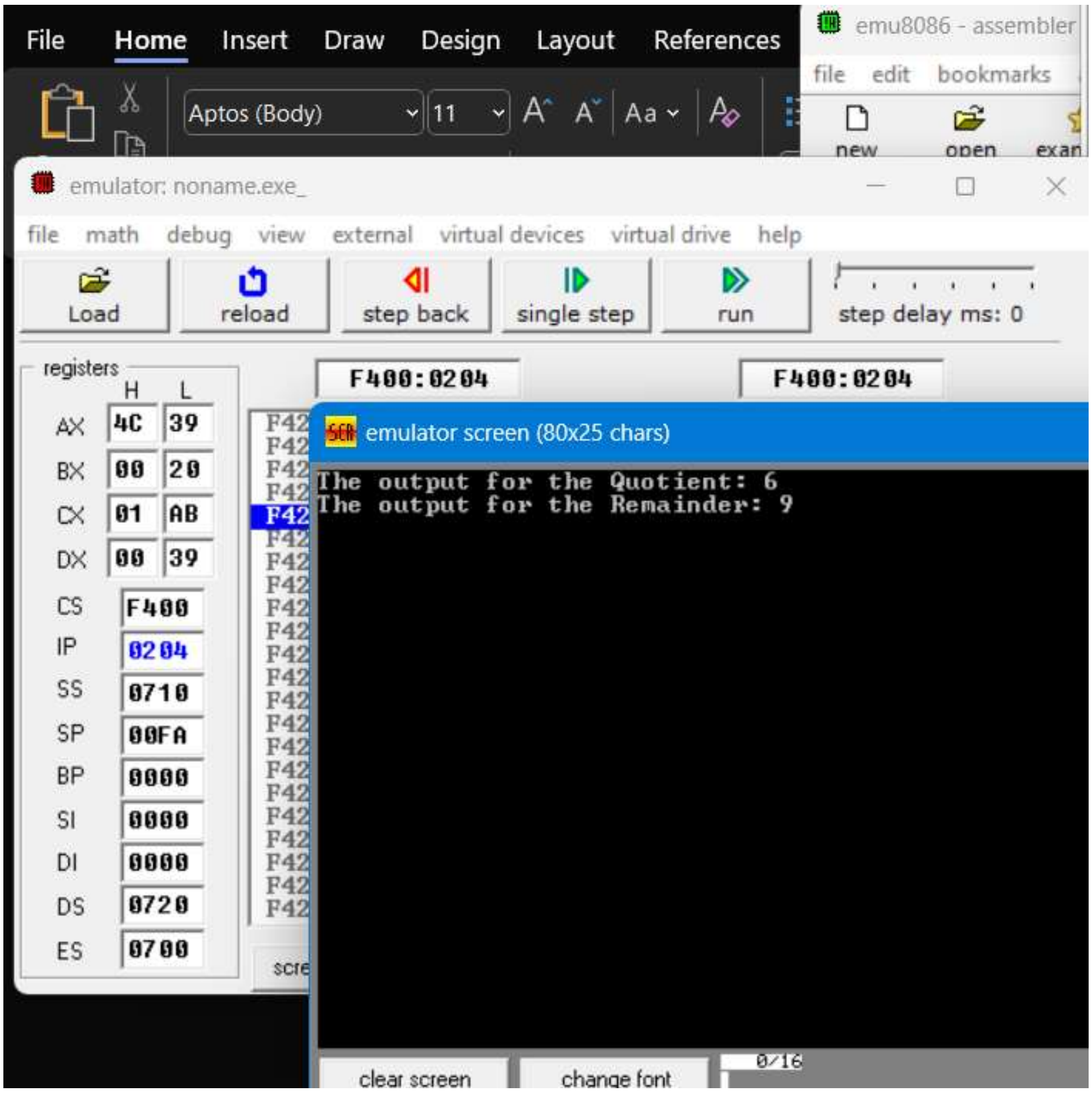
1.Write an assembly language program to perform division of 8-bit data.

CODE

```
.model small
.stack 100h

.data
   dividend db 0C9h
   divisor db 20h
   quotient db ?
   remainder db ?
   msg1 db 'The output for the Quotient: $'
   msg2 db 0Dh, 0Ah, 'The output for the Remainder: $'

.code
main proc
   mov ax, @data
   mov ds, ax
   mov al, dividend
   mov bl, divisor
   xor ah, ah
   div bl
   mov quotient, al
   mov remainder, ah

   mov ah, 09h
   lea dx, msg1
   int 21h

   mov al, quotient
   call display_number

   mov ah, 09h
   lea dx, msg2
   int 21h

   mov al, remainder
   call display_number

   mov ah, 4ch
   int 21h
main endp

display_number proc
   cmp al, 10
   jb single_digit

   mov ah, 0
   mov bl, 0Ah
   div bl

   add al, 30h
```

```
    mov dl, al
    mov ah, 02h
    int 21h

    mov al, ah
    add al, 30h
    mov dl, al
    mov ah, 02h
    int 21h
    ret

single_digit:
    add al, 30h
    mov dl, al
    mov ah, 02h
    int 21h
    ret
display_number endp

end main
```



```
      H   L
AX   4C  39
BX   00  20
CX   01  AB
DX   00  39
CS   F400
IP   0204
SS   0710
SP   00FA
BP   0000
SI   0000
DI   0000
DS   0720
ES   0700
```

F400:0204   F400:0204

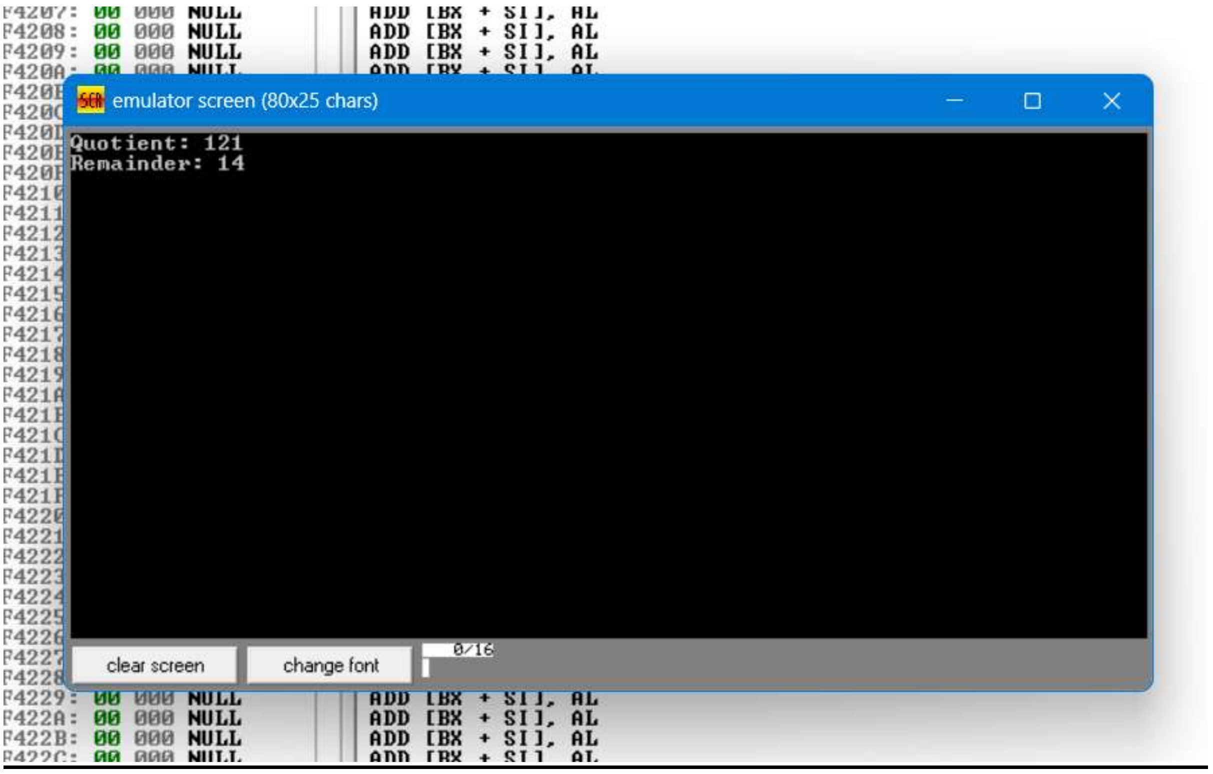
```
The output for the Quotient: 6
The output for the Remainder: 9
```

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

CODE

```
.model small
.stack 100h
.data
   dividend dw 1020h
   divisor dw 0022h
   quotient dw ?
   remainder dw ?
   msg1 db 'Quotient: $'
   msg2 db 0Dh, 0Ah, 'Remainder: $'
.code
main proc
   mov ax, @data
   mov ds, ax

   mov ax, dividend
   mov bx, divisor
   xor cx, cx
   xor dx, dx

division_loop:
   cmp ax, bx
   jb division_done
   sub ax, bx
   inc cx
   jmp division_loop

division_done:
   mov quotient, cx
   mov remainder, ax

   mov ah, 09h
   lea dx, msg1
   int 21h

   mov ax, quotient
   call display_number_16

   mov ah, 09h
   lea dx, msg2
   int 21h

   mov ax, remainder
   call display_number_16

   mov ah, 4ch
   int 21h
main endp

display_number_16 proc
   push ax
```

```
    push bx
    push dx

    mov bx, 10
    xor cx, cx

convert_loop:
    xor dx, dx
    div bx
    push dx
    inc cx
    test ax, ax
    jnz convert_loop

print_digits:
    pop dx
    add dl, '0'
    mov ah, 02h
    int 21h
    loop print_digits

    pop dx
    pop bx
    pop ax
    ret
display_number_16 endp
end main
```



```
F4208: 00 000 NULL        ADD [BX + SI], AL
F4209: 00 000 NULL        ADD [BX + SI], AL
```

```
Quotient: 121
Remainder: 14
```

```
F4229: 00 000 NULL        ADD [BX + SI], AL
F422A: 00 000 NULL        ADD [BX + SI], AL
F422B: 00 000 NULL        ADD [BX + SI], AL
```