AP22110010351

K NIKITHA SRI

CSE-F

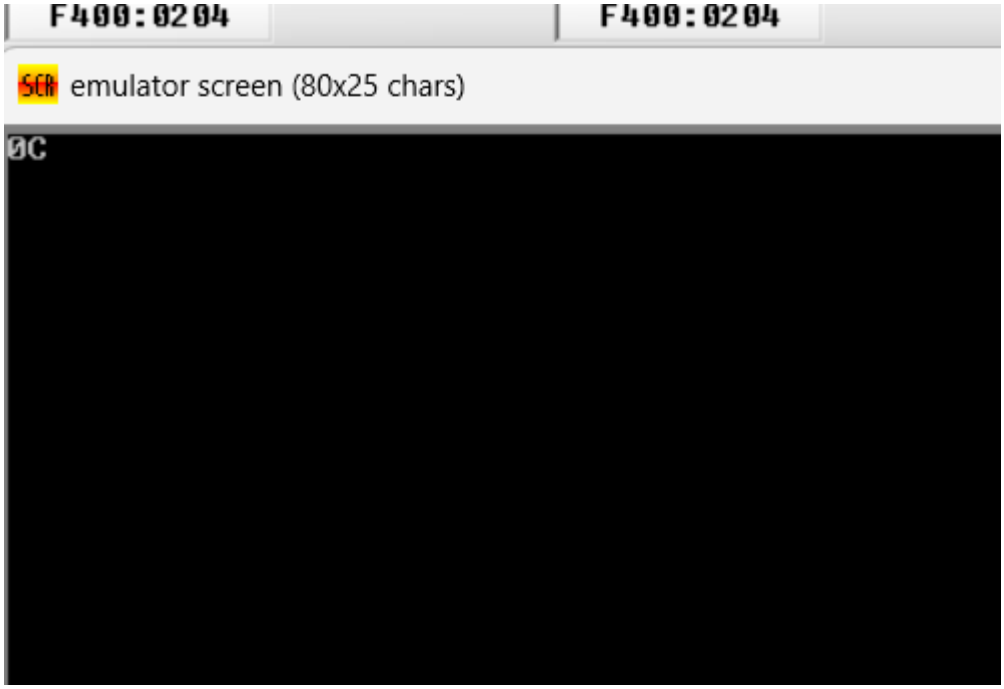
COA LAB ASSIGNMENT-4

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

```
org 100h        ; Set starting address
mov al, 05h     ; Load AL with 05h
mov bl, 02h     ; Load BL with 02h
mul bl          ; Multiply AL by BL, result in AX (AL * BL)
mov bl, al      ; Move result (AL) to BL for later use
mov ah, al      ; Move AL to AH
; Convert upper nibble to ASCII
and ah, 0F0h    ; Mask lower nibble, keep upper
shr ah, 4       ; Shift upper nibble to lower position
add ah, 30h     ; Convert to ASCII '0'-'9'
cmp ah, 39h     ; Compare with '9'
jle print_first_digit ; If less or equal to '9', skip next step
add ah, 7       ; Convert to ASCII 'A'-'F'
print_first_digit:
mov dl, ah      ; Move first digit to DL
mov ah, 02h     ; Prepare for output
int 21h         ; Print first digit
; Convert lower nibble to ASCII
mov ah, bl      ; Move result (BL) back to AH
and ah, 0Fh     ; Mask upper nibble, keep lower
add ah, 30h     ; Convert to ASCII '0'-'9'
cmp ah, 39h     ; Compare with '9'
jle print_sec_digit ; If less or equal to '9', skip next step
add ah, 7       ; Convert to ASCII 'A'-'F'
print_sec_digit:
mov dl, ah      ; Move second digit to DL
```

```
mov ah, 02h     ; Prepare for output
int 21h         ; Print second digit
mov ah, 4Ch     ; Prepare for program termination
int 21h         ; Terminate program
```

Output:



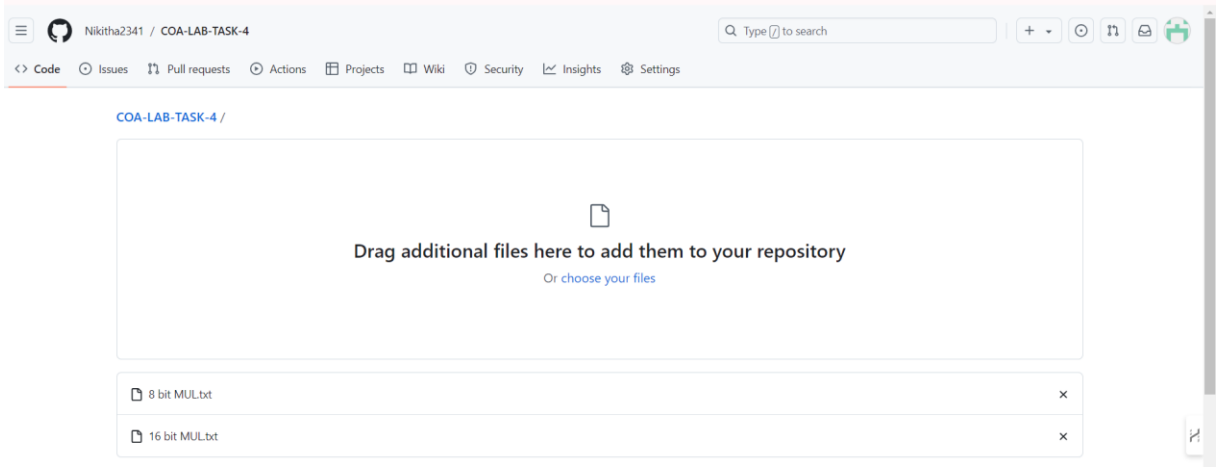
2. Write a program in assembly language to perform multiplication of 16-bit data.

```
org 100h            ; Set starting address
mov ax,0012h ;Load AX with 5678h
mov bx,0012h    ; Load BX with 1234h
mul bx              ; Multiply AX by BX, result in DX:AX
mov bx, ax          ; Move the lower 16 bits of the result (AX) into BX
; Convert and print the high nibble of BH
mov ah, bh          ; Move BH (high byte of BX) to AH
shr ah, 4           ; Shift right to isolate the high nibble
add ah, 30h         ; Convert to ASCII '0'-'9'
cmp ah, 39h         ; Compare with '9'
jle print_high_nibble ; If less than or equal, skip next step
```

```
add ah, 7          ; Adjust to ASCII 'A'-'F'
print_high_nibble:
mov dl, ah         ; Move the ASCII value to DL
mov ah, 02h        ; Set up for printing
int 21h            ; Print the high nibble of BH
; Convert and print the low nibble of BH
mov ah, bh         ; Move BH back to AH
and ah, 0fh        ; Mask the high nibble, keep the low nibble
add ah, 30h        ; Convert to ASCII '0'-'9'
cmp ah, 39h        ; Compare with '9'
jle print_low_nibble ; If less than or equal, skip next step
add ah, 7          ; Adjust to ASCII 'A'-'F'
print_low_nibble:
mov dl, ah         ; Move the ASCII value to DL
mov ah, 02h        ; Set up for printing
int 21h            ; Print the low nibble of BH
; Convert and print the high nibble of BL
mov ah, bl         ; Move BL (low byte of BX) to AH
shr ah, 4          ; Shift right to isolate the high nibble
add ah, 30h        ; Convert to ASCII '0'-'9'
cmp ah, 39h        ; Compare with '9'
jle print_high_nibble2 ; If less than or equal, skip next step
add ah, 7          ; Adjust to ASCII 'A'-'F'
print_high_nibble2:
mov dl, ah         ; Move the ASCII value to DL
mov ah, 02h        ; Set up for printing
int 21h            ; Print the high nibble of BL
; Convert and print the low nibble of BL
mov ah, bl         ; Move BL back to AH
and ah, 0fh        ; Mask the high nibble, keep the low nibble
add ah, 30h        ; Convert to ASCII '0'-'9'
```

```
cmp ah, 39h         ; Compare with '9'
jle print_low_nibble2 ; If less than or equal, skip next step
add ah, 7           ; Adjust to ASCII 'A'-'F'
print_low_nibble2:
mov dl, ah          ; Move the ASCII value to DL
mov ah, 02h         ; Set up for printing
int 21h             ; Print the low nibble of BL
; Terminate the program
mov ah, 4ch         ; Set up for program termination
int 21h             ; Terminate the program
```

output:



GITHUB LINK:

https://github.com/Nikitha2341/COA-LAB-TASK-4/upload