

(Question 1)

Develop an ALP to display "YOUR NAME: Roll number" in the default display using DOS string interrupt.

(Aim)

To display string using DOS string interrupt

(Algorithm/Pseudocode)

START

Store the String to be displayed in variable MSG in data segment

Call Service Number 09H used to write string character

Load effective address of MSG in register DX

Execute Interrupt 21H (DOS Interrupt) to display on default screen

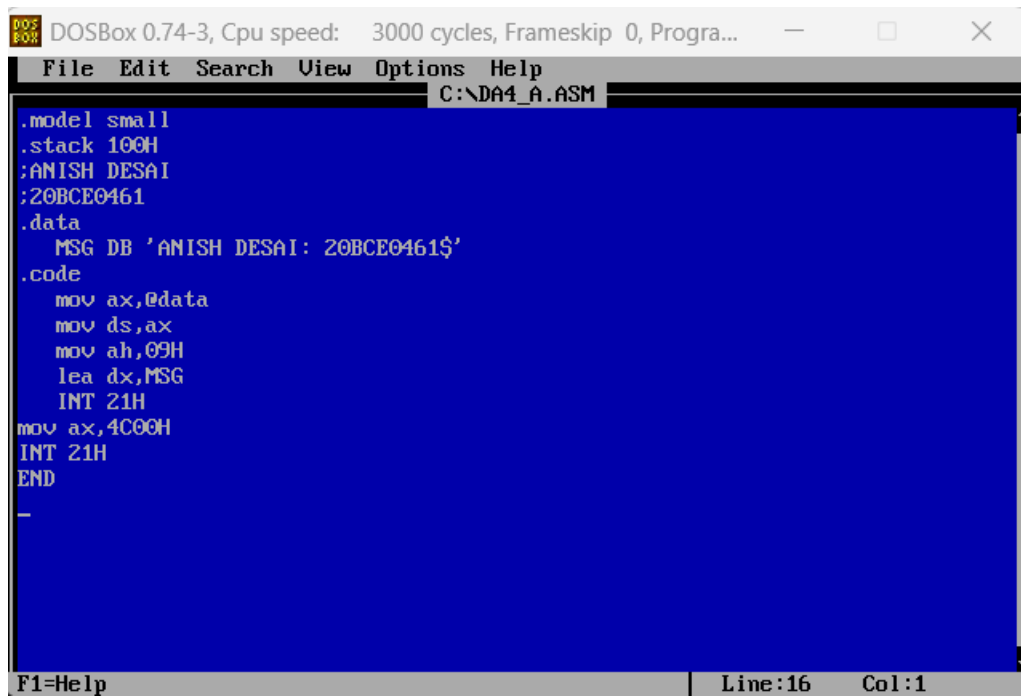
END

(Flowchart)

No branch instructions, thus flowchart not required.

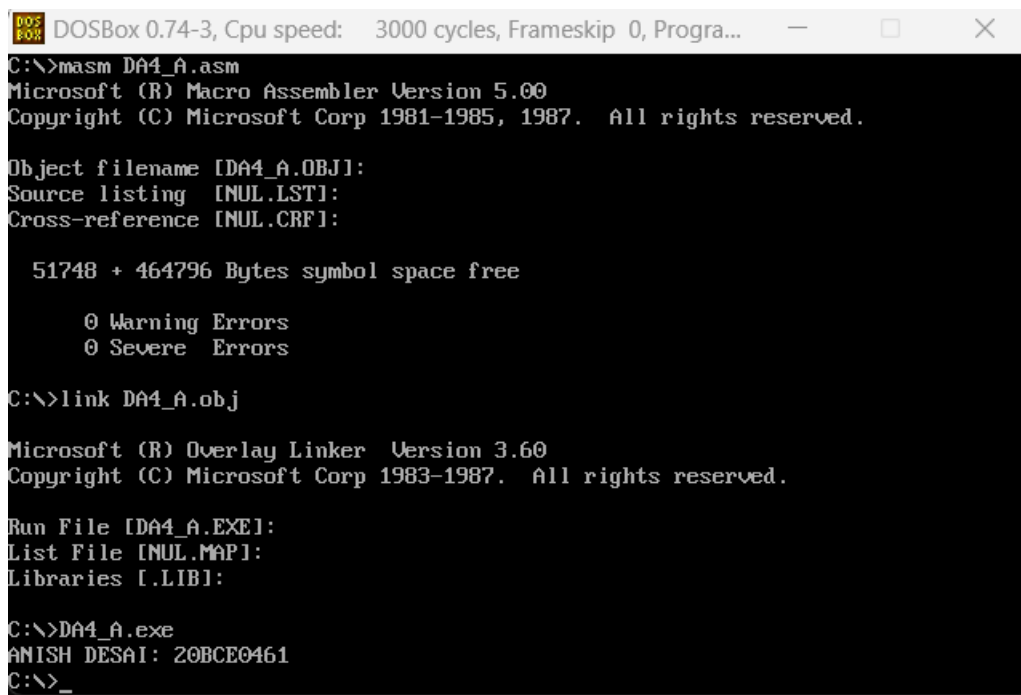
(ALP Code)

```
.model small
.stack 100H
;ANISH DESAI
;20BCE0461
.data
    MSG DB 'ANISH DESAI: 20BCE0461$'
.code
    mov ax,@data
    mov ds,ax
    mov ah,09H
    lea dx,MSG
    INT 21H
mov ax,4C00H
INT 21H
END
```



```
DOS BOX DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...
File Edit Search View Options Help
C:\DA4_A.ASM
.model small
.stack 100H
;ANISH DESAI
;20BCE0461
.data
MSG DB 'ANISH DESAI: 20BCE0461$'
.code
mov ax,0data
mov ds,ax
mov ah,09H
lea dx,MSG
INT 21H
mov ax,4C00H
INT 21H
END
-
F1=Help Line:16 Col:1
```

(MASM Output)



```
DOS BOX DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...
C:\>masm DA4_A.asm
Microsoft (R) Macro Assembler Version 5.00
Copyright (C) Microsoft Corp 1981-1985, 1987. All rights reserved.

Object filename [DA4_A.OBJ]:
Source listing [NUL.LST]:
Cross-reference [NUL.CRF]:

51748 + 464796 Bytes symbol space free

0 Warning Errors
0 Severe Errors

C:\>link DA4_A.obj

Microsoft (R) Overlay Linker Version 3.60
Copyright (C) Microsoft Corp 1983-1987. All rights reserved.

Run File [DA4_A.EXE]:
List File [NUL.MAP]:
Libraries [.LIB]:

C:\>DA4_A.exe
ANISH DESAI: 20BCE0461
C:\>_
```

(Result)

String has been successfully displayed using DOS String (21H) Interrupt.

(Question 2)

Repeat the above task using file interrupt.

(Aim)

To display string using File interrupt

(Algorithm/Pseudocode)

START

Store the String to be displayed in variable MSG in data segment

Call Service number 40H for write service

Set Screen file handle

Set length of message

Get address of MSG

Display MSG using Interrupt 21H

END

(Flowchart)

No branch instructions, thus flowchart not required.

(ALP Code)

```
.model small
```

```
.stack 100H
```

```
;ANISH DESAI
```

```
;20BCE0461
```

```
.data
```

```
MSG DB 'ANISH DESAI: 20BCE0461$'
```

```
.code
```

```
mov ax,@data
```

```
mov ds,ax
```

```
mov ah,40H
```

```
mov bx,1
```

```
mov cx,22
```

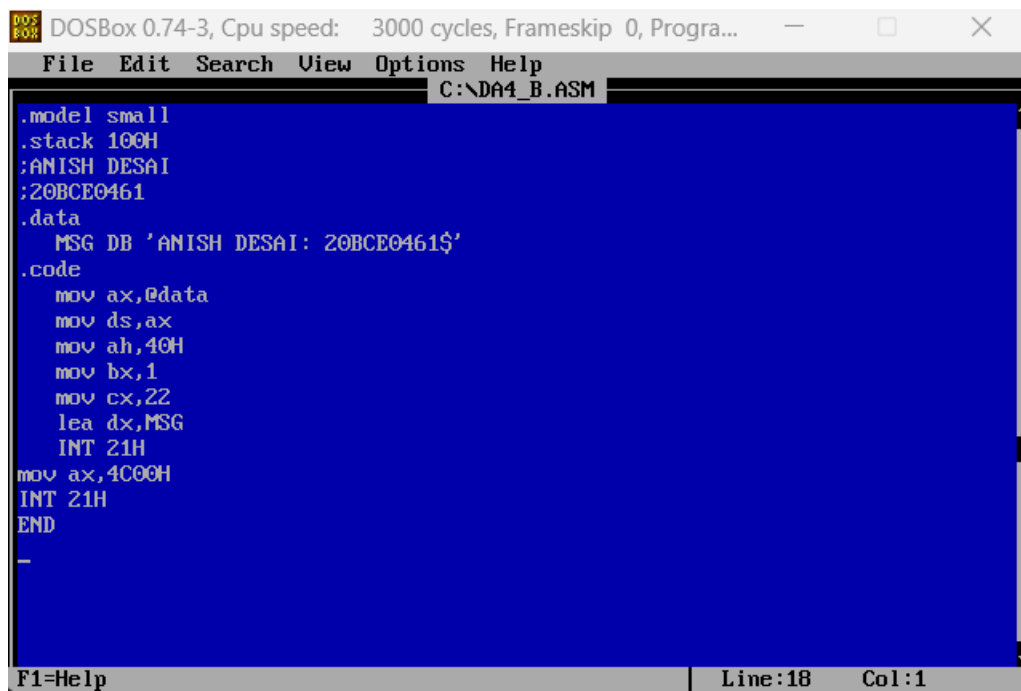
```
lea dx,MSG
```

```
INT 21H
```

```
mov ax,4C00H
```

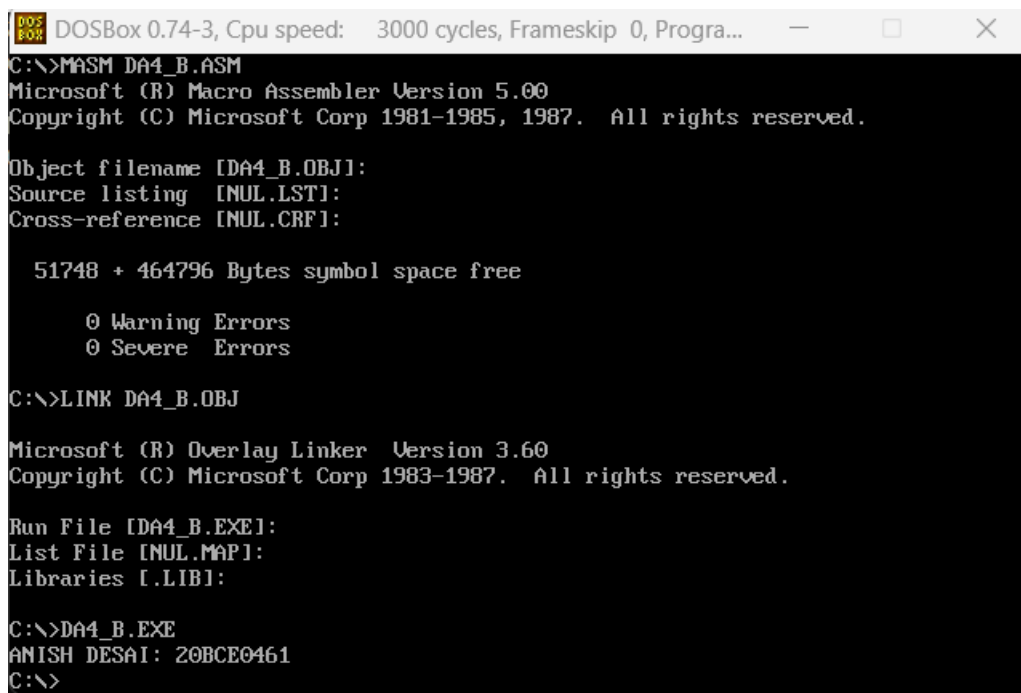
```
INT 21H
```

```
END
```



```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...
File Edit Search View Options Help
C:\DA4_B.ASM
.model small
.stack 100H
;ANISH DESAI
;20BCE0461
.data
MSG DB 'ANISH DESAI: 20BCE0461$'
.code
mov ax,@data
mov ds,ax
mov ah,40H
mov bx,1
mov cx,22
lea dx,MSG
INT 21H
mov ax,4C00H
INT 21H
END
-
F1=Help | Line:18 Col:1
```

(MASM Output)



```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...
C:\>MASM DA4_B.ASM
Microsoft (R) Macro Assembler Version 5.00
Copyright (C) Microsoft Corp 1981-1985, 1987. All rights reserved.

Object filename [DA4_B.OBJ]:
Source listing [NUL.LST]:
Cross-reference [NUL.CRF]:

51748 + 464796 Bytes symbol space free

0 Warning Errors
0 Severe Errors

C:\>LINK DA4_B.OBJ

Microsoft (R) Overlay Linker Version 3.60
Copyright (C) Microsoft Corp 1983-1987. All rights reserved.

Run File [DA4_B.EXE]:
List File [NUL.MAP]:
Libraries [.LIB]:

C:\>DA4_B.EXE
ANISH DESAI: 20BCE0461
C:\>
```

(Result)

String has been successfully displayed using File Interrupt (40H and INT 21H).

(Question 3)

Repeat using BIOS interrupt. [int 13h]

(Aim)

To display string using BIOS interrupt

(Algorithm/Pseudocode)

START

Store the message and its length in MSG and LEN respectively in the data segment

Set default display page number in BH

Set Foreground and Background colour in BL

Set length of the message in CX

Set Column and Row numbers in DL and DH respectively

Get address of MSG

Call Service Number 13H

Execute Interrupt 10H

END

(Flowchart)

No branch instructions, thus flowchart not required.

(ALP Code)

```
.model small
```

```
.stack 100H
```

```
;ANISH DESAI
```

```
;20BCE0461
```

```
.data
```

```
MSG DB 'ANISH DESAI: 20BCE0461'
```

```
LEN EQU $ - MSG
```

```
.code
```

```
start:
```

```
mov ax,@data
```

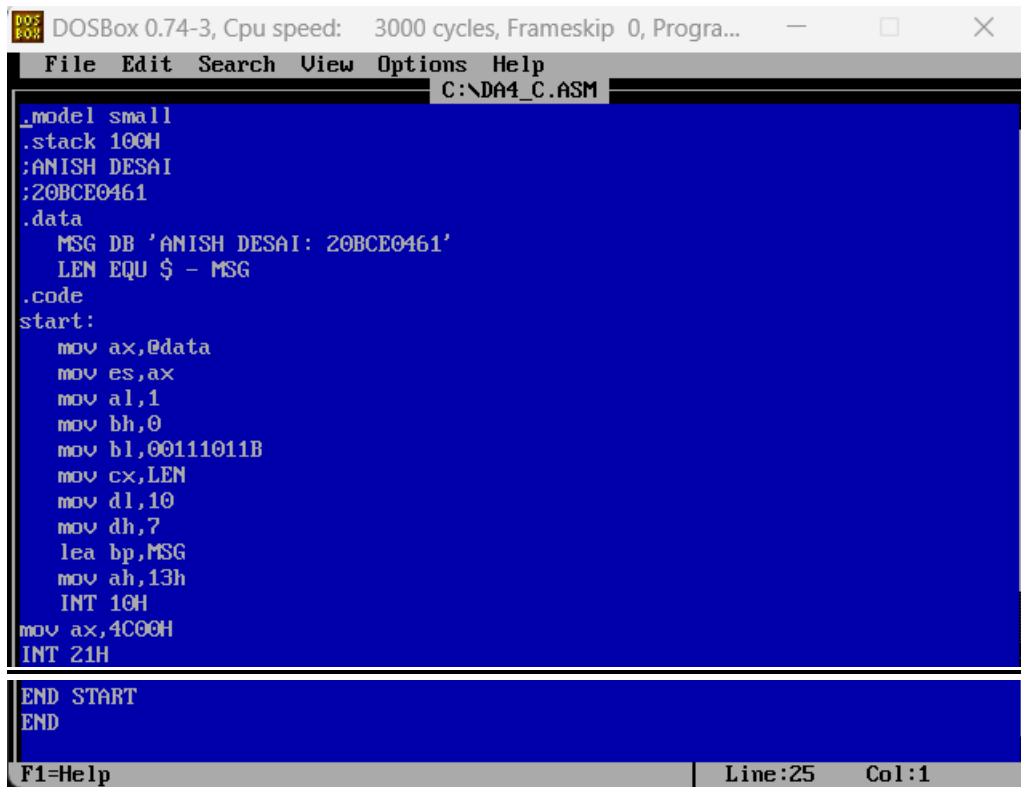
```
mov es,ax
```

```
mov al,1
```

```
mov bh,0
```

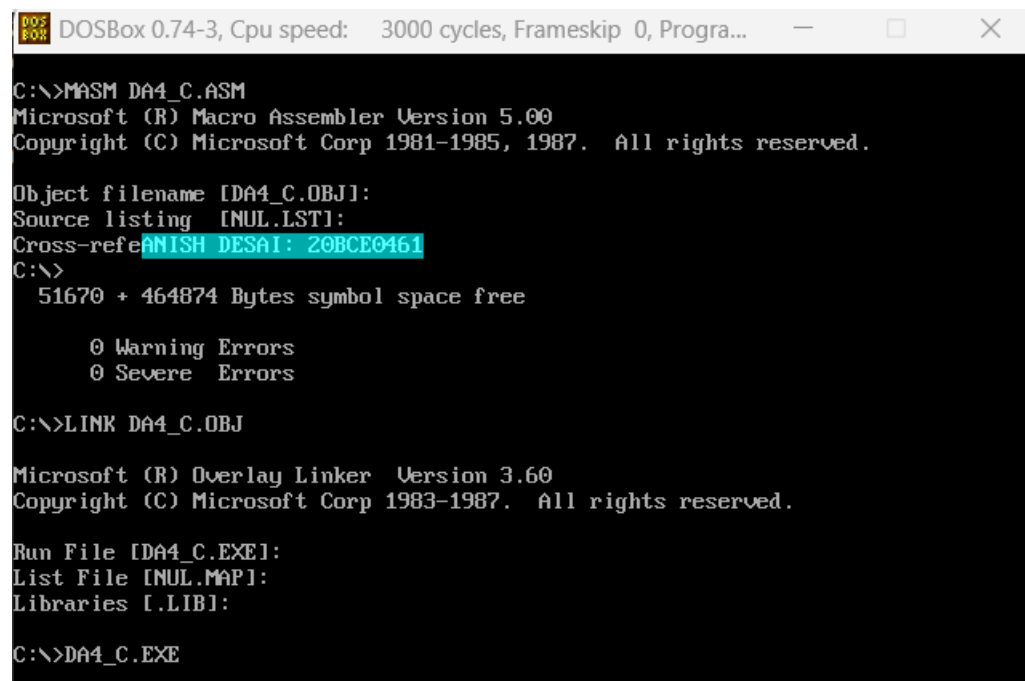
```
mov bl,00111011B
```

```
mov cx,LEN
mov dl,10
mov dh,7
lea bp,MSG
mov ah,13h
INT 10H
mov ax,4C00H
INT 21H
END START
END
```



```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...
File Edit Search View Options Help
C:\DA4_C.ASM
.model small
.stack 100H
;ANISH DESAI
;20BCE0461
.data
MSG DB 'ANISH DESAI: 20BCE0461'
LEN EQU $ - MSG
.code
start:
mov ax,@data
mov es,ax
mov al,1
mov bh,0
mov bl,00111011B
mov cx,LEN
mov dl,10
mov dh,7
lea bp,MSG
mov ah,13h
INT 10H
mov ax,4C00H
INT 21H
END START
END
F1=Help | Line:25 Col:1
```

(MASM Output)



```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...
C:\>MASM DA4_C.ASM
Microsoft (R) Macro Assembler Version 5.00
Copyright (C) Microsoft Corp 1981-1985, 1987. All rights reserved.

Object filename [DA4_C.OBJ]:
Source listing [NUL.LST]:
Cross-reference [ANISH DESAI: 20BCE0461]
C:\>
    51670 + 464874 Bytes symbol space free

    0 Warning Errors
    0 Severe Errors

C:\>LINK DA4_C.OBJ

Microsoft (R) Overlay Linker Version 3.60
Copyright (C) Microsoft Corp 1983-1987. All rights reserved.

Run File [DA4_C.EXE]:
List File [NUL.MAP]:
Libraries [.LIB]:

C:\>DA4_C.EXE
```

(Result)

As we can see from MASM screen above, execution of the ASM file results in successful display of the message on the screen with Fg and Bg colour using BIOS 13H service.

(Question 4)

Develop an ALP to create a file name "HFLXXXX.try" where XXXX is the last 4 digits of registration number. Write the message "Hello world! This is your name" and finally close the file.

(Aim)

To demonstrate file handling

(Algorithm/Pseudocode)

START

Data Segment:

Set File Name

Set Handle

Set Message

Data Segment Ends

Call Service number 3CH to create new file

Get address of File name

Set file attribute

Execute Interrupt 21H

Call Service number 40H to write in file

Set number of bytes to write

Get address of message

Execute Interrupt 21H

Call Service number 3EH to close the file

Execute Interrupt 21H

END

(Flowchart)

No branch instructions, thus flowchart not required.

(ALP Code)

.model small

.stack 100H

;ANISH DESAI

;20BCE0461

.data

FNAME DB 'HFL0461.try'

HANDLE DW ?

MSG DB 'Hello World! Anish Desai'

.code

mov ax,@data

mov ds,ax

mov ah,3CH

lea dx,FNAME

mov cl,1

INT 21H

mov HANDLE,ax

mov ah,40H

mov bx,HANDLE

mov cx,24

lea dx,MSG

INT 21H

mov ah,3EH

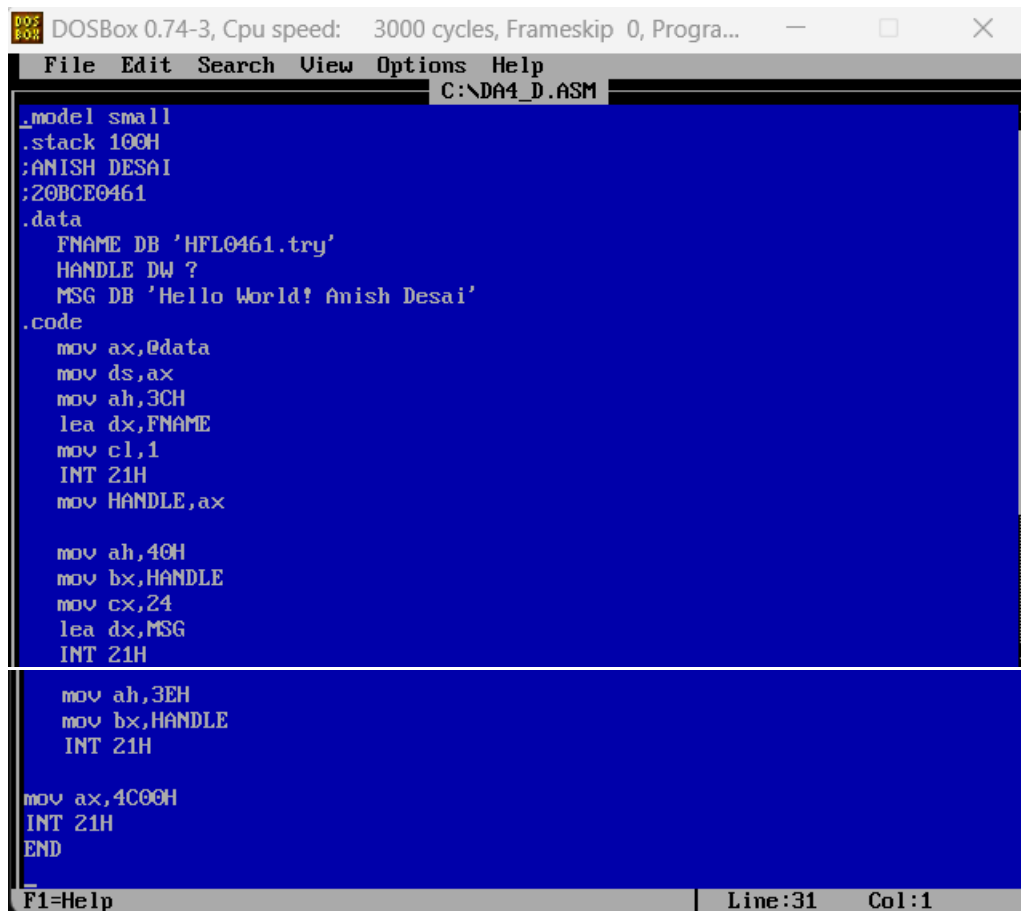
mov bx,HANDLE

INT 21H

mov ax,4C00H

INT 21H

END



```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...
File Edit Search View Options Help
C:\DA4_D.ASM

.model small
.stack 100H
;ANISH DESAI
;20BCE0461
.data
    FNAME DB 'HFL0461.try'
    HANDLE DW ?
    MSG DB 'Hello World! Anish Desai'
.code
    mov ax,@data
    mov ds,ax
    mov ah,3CH
    lea dx,FNAME
    mov cl,1
    INT 21H
    mov HANDLE,ax

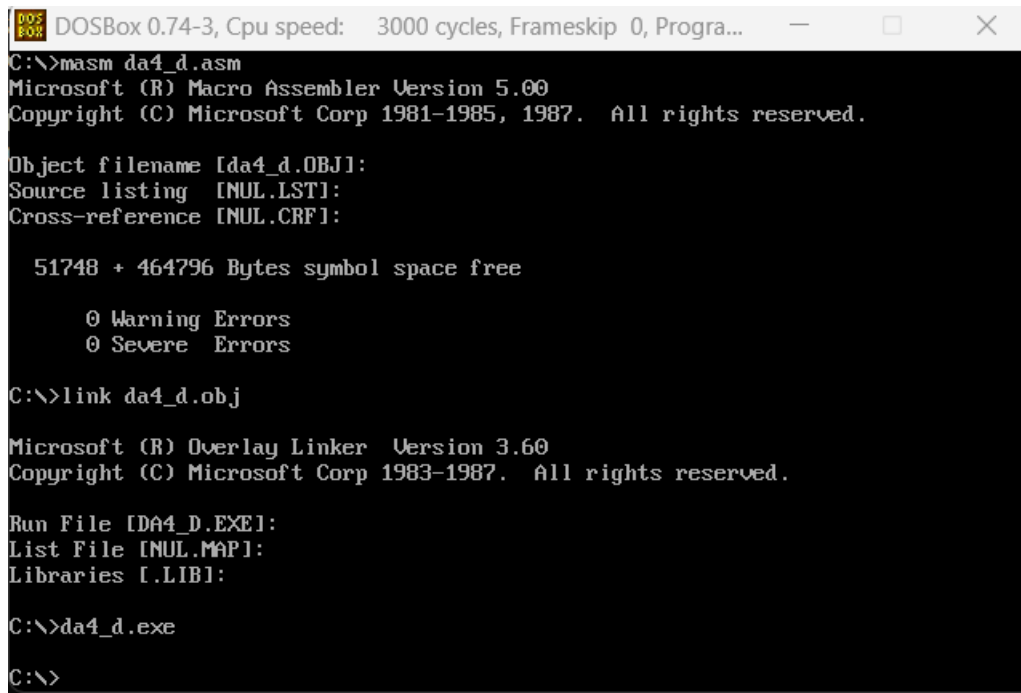
    mov ah,40H
    mov bx,HANDLE
    mov cx,24
    lea dx,MSG
    INT 21H

    mov ah,3EH
    mov bx,HANDLE
    INT 21H

    mov ax,4C00H
    INT 21H
END

F1=Help | Line:31 Col:1
```

(MASM Output)



```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...
C:\>masm da4_d.asm
Microsoft (R) Macro Assembler Version 5.00
Copyright (C) Microsoft Corp 1981-1985, 1987. All rights reserved.

Object filename [da4_d.OBJ]:
Source listing [NUL.LST]:
Cross-reference [NUL.CRF]:

    51748 + 464796 Bytes symbol space free

    0 Warning Errors
    0 Severe Errors

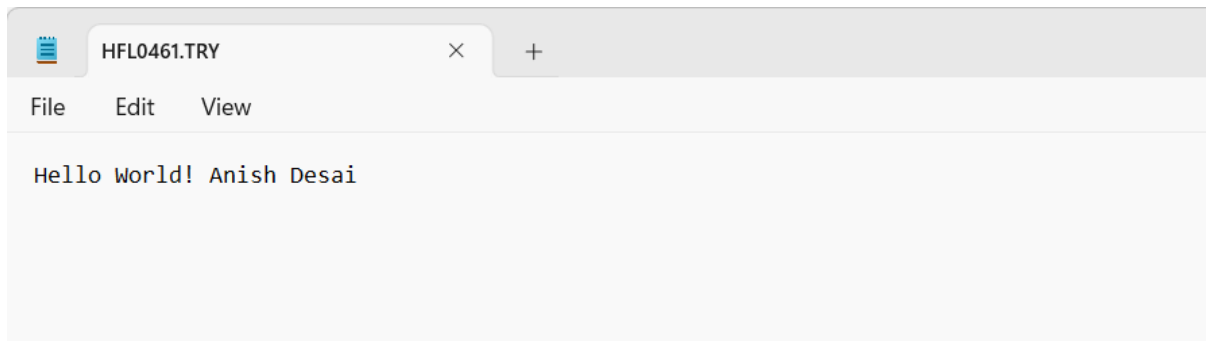
C:\>link da4_d.obj

Microsoft (R) Overlay Linker Version 3.60
Copyright (C) Microsoft Corp 1983-1987. All rights reserved.

Run File [DA4_D.EXE]:
List File [NUL.MAP]:
Libraries [.LIB]:

C:\>da4_d.exe

C:\>
```

**(Result)**

As we can see from above MASM screen and File screenshots, upon execution, file has been created successfully and the intended message is clearly written and reflected in the file.
