

Experiment 08 : Mouse Interfacing

Learning Objective: Student should be able to Develop program to interface mouse driver.

Tools: TASM/MASM

Theory:

Interface mouse using Int 33H

Int 33h MS Mouse Interrupt

Function 0 Reset

Input

AX = 0

Output

AX = mouse status -1 = installed

0 = not installed

BX = number of buttons

Function 1 Show Mouse Cursor

Input

AX = 1

Output

NONE

Function 2 Hide Mouse Cursor

Input

AX = 2

Output

NONE

Function 3 Get Mouse Position & Button Status

Input

AX = 3

Output

BX = Button Status

xxxx xxxx xxxx xMRL

M=middle (if present) R=right L=left

0= not pressed 1 = pressed

CX = Horizontal Mouse Cursor Position

DX = Vertical Mouse Cursor Position

(div positions by 2 for med res
graphics; div by 8 for text mode)

Function 4 Set Mouse Cursor Position

Input

AX = 4

CX = new horizontal cursor position

DX = new vertical cursor position

Output

NONE

Function 5 Get Button Press Information

Input

AX = 5

BX = button of interest (0=L; 1=R; 2=M)

Output

AX = button status (current status of ALL buttons)

BX = number of buutton presses on specified button

CX = horizontal position at last press

DX = vertical position at last press

Function 6 Get Button Release Information

Input

AX = 6

BX = button of interest (0=L; 1=R; 2=M)

Output

AX = button status (current status of ALL buttons)

BX = number of buutton presses on specified button

CX = horizontal position at last release

DX = vertical position at last release

Function 7 Set Minimum and Maximum X Position

Input

AX = 7

CX = new minimum horizontal cursor position

DX = new maximum horizontal cursor position

Output

NONE

Function 8 Set Minimum and Maximum Y Position

Input

AX = 8

CX = new minimum vertical cursor position

DX = new maximum vertical cursor position

Output

NONE

Function 9 Define Graphics Cursor

Input

AX = 9

BX = horizontal cursor hot spot (0,0) upper left

CX = vertical cursor hot spot

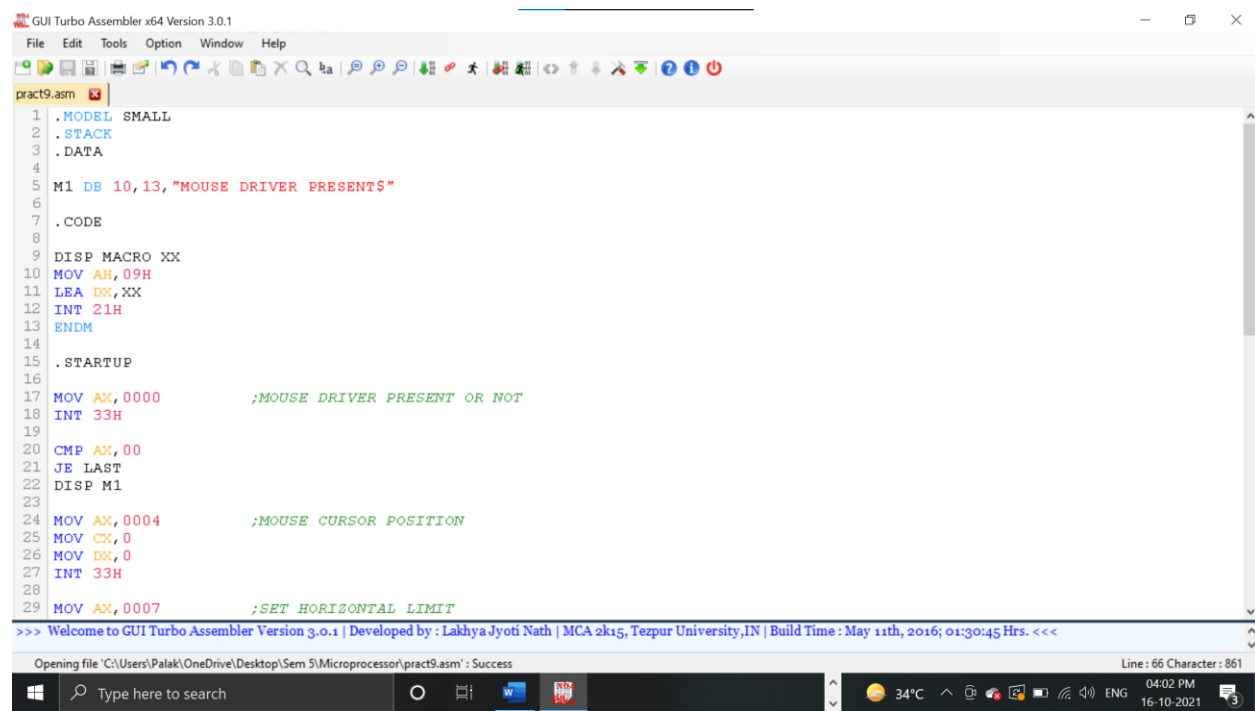
ES:DX = address of screen and cursor mask

Output

NONE

Application: Use of Int 33 H to interface mouse with system.

Design:



The screenshot shows the GUI Turbo Assembler x64 Version 3.0.1 interface. The main window displays assembly code for a file named 'pract9.asm'. The code includes directives for .MODEL, .STACK, and .DATA, followed by a macro definition for displaying text. The main code block starts with a .STARTUP section, where it initializes AX to 0000, calls INT 33H to check for a mouse, and then sets up the cursor position by calling INT 33H again with CX set to 0 and DX set to 0. The code ends with a .CODE section and a .STARTUP section.

```
1 .MODEL SMALL
2 .STACK
3 .DATA
4
5 M1 DB 10,13,"MOUSE DRIVER PRESENTS"
6
7 .CODE
8
9 DISP MACRO XX
10 MOV AH,09H
11 LEA DX,XX
12 INT 21H
13 ENDM
14
15 .STARTUP
16
17 MOV AX,0000 ;MOUSE DRIVER PRESENT OR NOT
18 INT 33H
19
20 CMP AX,00
21 JE LAST
22 DISP M1
23
24 MOV AX,0004 ;MOUSE CURSOR POSITION
25 MOV CX,0
26 MOV DX,0
27 INT 33H
28
29 MOV AX,0007 ;SET HORIZONTAL LIMIT
30
```

The status bar at the bottom shows the file path: 'C:\Users\Palak\OneDrive\Desktop\Sem 5\Microprocessor\pract9.asm'. The system tray on the right shows the temperature as 34°C, the time as 04:02 PM, and the date as 16-10-2021.

GUI Turbo Assembler x64 Version 3.0.1

File Edit Tools Option Window Help

pract9.asm

```
29 MOV AX,0007          ;SET HORIZONTAL LIMIT
30 MOV CX,0010
31 MOV DX,055H
32 INT 33H
33
34 MOV AX,0008          ;SET VERTICAL LIMIT
35 MOV CX,0010
36 MOV DX,055H
37 INT 33H
38
39 PIXEL:
40 MOV AX,0001          ;DISPLAY MOUSE CURSOR
41 INT 33H
42
43 MOV AX,0003H          ;GRT STATUS OF MOUSE
44 INT 33H
45 CMP BX,01            ;LEFT BUTTON
46 JE LEFT
47 JMP RIGHT
48
49 LEFT:
50 MOV AX,0001H          ;SET GRAPHICS MODE
51 INT 10H
52
53 MOV AH,0CH            ;DISPLAY PIXEL ON SCREEN
54 INT 10H
55
56 RIGHT:
57 CMP BX,02
```

>>> Welcome to GUI Turbo Assembler Version 3.0.1 | Developed by : Lakhya Jyoti Nath | MCA 2k15, Tezpur University,IN | Build Time : May 11th, 2016; 01:30:45 Hrs. <<<

Opening file 'C:\Users\Palak\OneDrive\Desktop\Sem 5\Microprocessor\pract9.asm': Success

Line: 56 Character: 861

Type here to search

34°C 04:02 PM 16-10-2021

GUI Turbo Assembler x64 Version 3.0.1

File Edit Tools Option Window Help

pract9.asm*

```
40 MOV AX,0001          ;DISPLAY MOUSE CURSOR
41 INT 33H
42
43 MOV AX,0003H          ;GRT STATUS OF MOUSE
44 INT 33H
45 CMP BX,01            ;LEFT BUTTON
46 JE LEFT
47 JMP RIGHT
48
49 LEFT:
50 MOV AX,0001H          ;SET GRAPHICS MODE
51 INT 10H
52
53 MOV AH,0CH            ;DISPLAY PIXEL ON SCREEN
54 INT 10H
55
56 RIGHT:
57 CMP BX,02
58 JE LAST
59 JMP PIXEL
60
61 LAST:
62 MOV AX,00            ;SET TEXT MODE
63 INT 10H
64
65 .EXIT
66 END
67
68
```

>>> Welcome to GUI Turbo Assembler Version 3.0.1 | Developed by : Lakhya Jyoti Nath | MCA 2k15, Tezpur University,IN | Build Time : May 11th, 2016; 01:30:45 Hrs. <<<

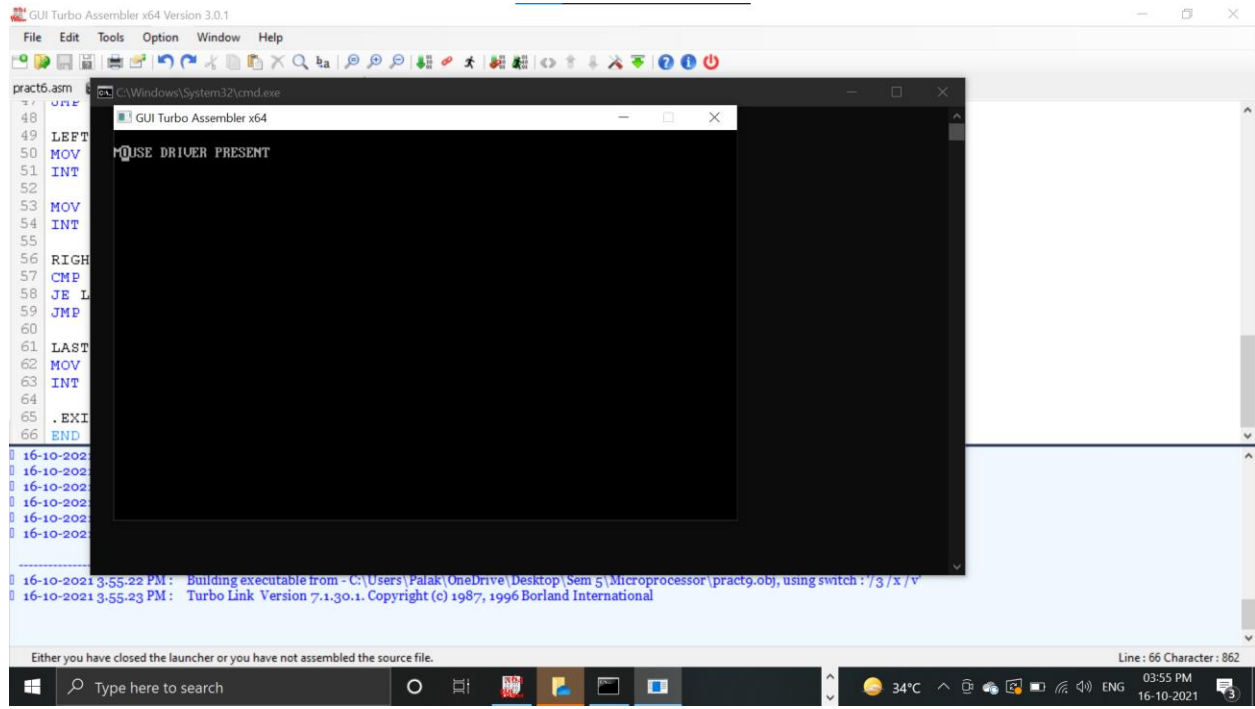
Opening file 'C:\Users\Palak\OneDrive\Desktop\Sem 5\Microprocessor\pract9.asm': Success

Line: 68 Character: 865

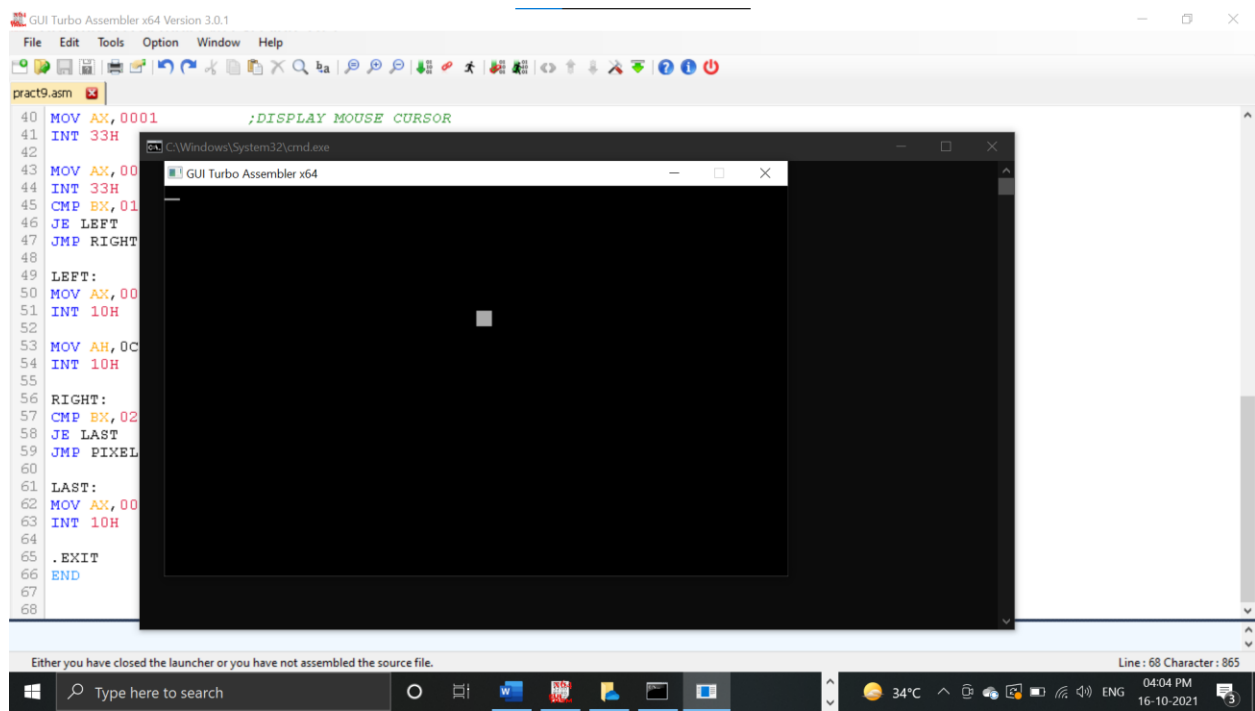
Type here to search

34°C 04:03 PM 16-10-2021

Result and Discussion:



```
GUI Turbo Assembler x64 Version 3.0.1
File Edit Tools Option Window Help
pract6.asm
48
49 LEFT
50 MOV
51 INT
52
53 MOV
54 INT
55
56 RIGHT
57 CMP
58 JE L
59 JMP
60
61 LAST
62 MOV
63 INT
64
65 .EXIT
66 END
16-10-2021 3:55:22 PM: Building executable from - C:\Users\Palak\OneDrive\Desktop\Sem 5\Microprocessor\pract9.obj, using switch: /3 /x /v
16-10-2021 3:55:23 PM: Turbo Link Version 7.1.30.1. Copyright (c) 1987, 1996 Borland International
Either you have closed the launcher or you have not assembled the source file.
Line: 66 Character: 862
```



```
GUI Turbo Assembler x64 Version 3.0.1
File Edit Tools Option Window Help
pract9.asm
40 MOV AX, 0001 ;DISPLAY MOUSE CURSOR
41 INT 33H
42
43 MOV AX, 00
44 INT 33H
45 CMP BX, 01
46 JE LEFT
47 JMP RIGHT
48
49 LEFT:
50 MOV AX, 00
51 INT 10H
52
53 MOV AH, 0C
54 INT 10H
55
56 RIGHT:
57 CMP BX, 02
58 JE LAST
59 JMP PIXEL
60
61 LAST:
62 MOV AX, 00
63 INT 10H
64
65 .EXIT
66 END
67
68
Either you have closed the launcher or you have not assembled the source file.
Line: 68 Character: 865
```

Program for the same was written.

Learning Outcomes: The student should have the ability to

LO 9.1 Compare DOS and BIOS interrupts.

LO 9.2 Develop an application for Mouse interfacing using INT 33H.

LO 9.3 Develop an application for keyboard and Printer interfacing using INT 09H and INT 05H respectively.

Course Outcomes: Upon completion of the course students will be able to make use of instructions of 8086 to build assembly and Mixed language programs.

Conclusion: A system to Interface mouse using Int 33h is designed successfully.

Viva Questions:

1. Which interrupt used for mouse interfacing?

For Faculty Use

Correction Parameters	Formative Assessment [40%]	Timely completion of Practical [40%]	Attendance / Learning Attitude [20%]	
Marks Obtained				