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Data Science

Department of Computer Science Engineering Data Science

Academic Year: 2022-23 **Semester: IV**
Class / Branch: S.E.D.S. **Subject: Microprocessor Lab**

Experiment No. 8

1. **Aim: Write a Mixed language program to increment, decrement the size of the cursor and also to disable it.**

2. **Software used: Dosbox, TurboC ,TASM**

3. **Theory :-**

Mixed Language Programming: There are times when programs written in one language have to call modules written in other languages. This is called as mixed language programming. Microsoft C supports mixed language programming. C programs calls assembly language routines that separately assembled using MASM or TASM. These assembled modules are linked with the compiled C modules to get combined executablefile.

Example Mixed Language Program :

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a,b,c;
printf("enter two numbers\n");
scanf("%d,%d",&a,&b);
asm mov ax,a;
asm mov bx,b;
asm add ax,bx;
asm mov c,ax;
printf("Sum is %d",c);
getch();
}
```

Interrupts in 8086

There are some extremely useful subroutines within BIOS or DOS that are available to the user through the INT (Interrupt) instruction.
• Format: INT xx; the interrupt number xx can be 00-FFH
– This gives a total of 256 interrupts
– Common Interrupts
• INT 10h Video Services
• INT 16h Keyboard Services
• INT 17h Printer Services
• INT 21h MS-DOS services
– Before the services, certain registers must have specific values in them,depending on the function being requested.

DOS Interrupts

- The interrupt types 20h-3Fh are serviced by DOS routines that provide high-level service to hardware as well as system resources such as files and directories
- The most useful is INT 21h, which provides many functions for doing keyboard, video, and file operations

BIOS interrupt

- BIOS interrupt calls are a facility that operating systems and application programs use to invoke the facilities of the Basic Input/Output System on IBM PC compatible computers.
- INT 10H subroutines are burned into the ROM BIOS and are used to communicate with the computer's screen video.Manipulation of screen text/graphics can be done via INT 10H.
- Among the functions associated with INT 10H are changing character or background color, clearing the screen, and changing the location of the cursor,each chosen by putting a specific value in register AH.

INT 10H function AH = 02 will change the position of the cursor to any location.

– Desired position is identified by row/column values in DX.

• Where DH = row and DL = column.

I**NT10H function AH=03** will get current cursor position

Registers DH and DL will have the current row and column positions and CX provides info about the shape of the cursor.

INT 10h function AH = 01h will set text-mode cursor shape.
input:
CH = cursor start line (bits 0-4) and options (bits 5-7).
CL = bottom cursor line (bits 0-4).

when bit 5 of CH is set to 0, the cursor is visible. when bit 5 is 1, the cursor is not visible. CX=2607h is an invisible cursor.

Program:

```
 #include<stdio.h>
#include<conio.h>
 int main()
 {
int i;
 clrscr();


printf("case1.increase\ncase2.decrease\ncase3.right\ncase4.left\ncase5.up\ncase6.down\ncas
e7disable");
  printf("\nenter your choice\n");
  while(1)
  {
  char a;

  a= getch();

switch(a)
{
case '1':
asm mov ch,0;
asm mov cl,7;
asm mov ah ,1;
asm int 10h;
break;

case '2':

asm mov ah ,1;
asm mov ch,6;
asm mov cl,7;
asm int 10h;
break;

case '3':

asm mov ah,03h;
asm int 10h;
asm inc dl;
asm mov ah,02h;
```

```
asm int 10h;
break;

case '4':

asm mov ah,03h;
asm int 10h;
asm dec dl;
asm mov ah,02h;
asm int 10h;
break;

case '5':

asm mov ah,03h;
asm int 10h;
asm dec dh;
asm mov ah,02h;
asm int 10h;
break;

case '6':

asm mov ah,03h;
asm int 10h;
asm inc dh;
asm mov ah,02h;
asm int 10h;
break;

case '7':

asm mov ah,01h;
asm mov cx,2607h;
asm int 10h;
break;

default:
return 0;
}

}
 }
```

4. **Conclusion :**