INPUTTING CHARACTER AND STRING – LECTURE #3

Course Teacher

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INTERRUPT (INT) FUNCTION

- The INT Instruction is used to invoke a DOS or BIOS routine. It has the format
- Syntax

INT interrupt_number

- where interrupt_number is a number that specifies a routine.

BIOS

The BIOS (Basic Input Output System) routines perform I/O operations for the PC. Unlike the DOS routines, which operate over the entire PC family, the BIOS routines are machine specific.

Each PC model has its own hardware configuration and its own BIOS routines, which invoke the machine's I/O port registers for input and output. Tile DOS I/O operations are ultimately carried out by the BIOS routines.

THE INT INSTRUCTION

To invoke a DOS or BIOS routine, the INT (interrupt) instruction is used. It has the format:

- INT interrupt_number

where interrupt_number is a number that specifies a routine. For example.

INT 16h-invokes a BIOS routine that performs keyboard input. we use a particular DOS routine, INT 2lh.

INT 21h functions expect input values to be in certain registers and retur

output values in other registers.

DOS INT 21H

DOS interrupt 21h has several functions to input character or string and displaying them.

Function No.	Description
1	single-key input
2	single-character output
9	character string output

FUNCTION # 1

- Single-Key Input
- Input: AH =I (Function Number)
- Output; AL = ASCII code of character key which is pressed
- = 0 if non -character key is pressed·

- To invoke the routine, execute these instructions:

```
MOV AH, I       ; input key function
INT 2Ih         ;ASCII code in AL
```

FUNCTION #2

- Display a character or execute a control function
- Input: AH = 2
- DL = ASCII code of the display character or control character
- Output: AL = ASCII code of the display character or control character

To display a character with this function, we put its ASCII code in DL. Or the character within single quote.

For example, the following instructions cause question mark to appear on screen

```
MOV AH,2
MOV DL, '?'
INT 21h
```

ASCII CODE FOR SOME CONTROL CHARACTERS

Special Control Characters

Dec	Hex	Char	Meaning
7	07	BEL	bell
8	08	BS	backspace
9	09	HT	horizontal tab
10	0A	LF	line feed
12	0C	FF	form feed
13	0D	CR	carriage return

SOME CONTROL CHARACTERS

ASCII code (Hex)	*Symbol*	*Function*
7	BEL	beep (sounds a tone)
8	BS	backspace
9	HT	tab
A	LF	line feed (new line)
D	CR	carriage return (start of current line)

On execution, AL gets the ASCII code of the control character.

FUNCTION #9

- Display a String
- Input: AH=9
- Input: DX – Offset address of string

The string must end with a ‘$' Character

Example:

MSG DB 'HEI.LO!$'

LEA – LOAD EFFECTIVE ADDRESS

INT 2Ih, function 9, expects the offset address of the character string to be In DX. To get it there, we use a new instruction LEA.

- Syntax:

LEA destination, source

TO DISPLAY A STRING

With DS initialized, we may print the "HELLO!" message by placing its address in DX and executing INT 21h.

- LEA DX, MSG ; get message
- MOV AH,9 ; display string function
- INT 2lh