CSE 331L / EEE 332L

Microprocessor Interfacing & Embedded System

Section: 6, 7 (Summer 2021)

Lab- 02: Functions

Example:

```
02  .MODEL SMALL
03  .STACK 100H
04  .DATA
05      NAME DB '3'
06  .CODE
07      MOV AH, 2
08      MOV DL, '?'
09      INT 21H
10
11      MOV AH, 4CH
12      INT 21H
13
```

.MODEL is the directive to specify the the size of the memory (code and data) the program needs
.STACK is the directive used to declare the stack segment. It sets aside a block of memory (in stack segment) to store the stack.
.DATA is the directive used to declare the data segment
.CODE is the directive used to declare the code segment

INT (Interrupt):

Interrupt-number **21h** used to invoke DOS functions.

Functions

Function #	**Routine**	**Function Execution**
1	Single-key input	➢ Choose the function # as required ➢ Place the **function number in AH** register (input) ➢ Invoke the instruction for interrupt **where the function needs to be executed: INT 21H**
2	Single-key output	
9	Character string output	
4CH	DOS exit function	

Function# 1: Single-key input

Input: AH = 1

Output: AL = ASCII code if character key is pressed
AL = 0 if non-character key is pressed

```
.MODEL SMALL
.STACK 100h

.CODE
    MOV AH, 1
    INT 21H

    EXIT:
    MOV AH, 4CH
    INT 21H
```

Function# 2: Single-key output

Input: AH = 2
DL = ASCII Code of the display character

Output: AL = ASCII Code of the display character

```
.MODEL SMALL
.STACK 100h

.CODE
    MOV AH, 2
    MOV DL, '?'
    INT 21H

    EXIT:
    MOV AH, 4CH
    INT 21H
```

Single-key Input/Output

```
.MODEL SMALL
.STACK 100h

.CODE
    MOV AH, 1
    INT 21H      ;input in AL
    MOV BL, AL   ;input moved to Bl

    MOV AH, 2
    MOV DL, BL
    INT 21H

    EXIT:
    MOV AH, 4CH
    INT 21H
```

Insert newline:

```
.MODEL SMALL
.STACK 100h

.CODE
    MOV AH, 1
    INT 21H       ;input in AL
    MOV BL, AL    ;input moved to Bl

    MOV AH, 2
    MOV DL, 10
    INT 21H
    MOV DL, 0DH
    INT 21H

    MOV AH, 2
    MOV DL, BL
    INT 21H

    EXIT:
    MOV AH, 4CH
    INT 21H
```

Multiple key Input

1. Take 3 single-key inputs and display the second input taken using the output function in a separate line.

Sample input & output
hk3 k

```
.MODEL SMALL
.STACK 100h

.CODE
    MOV AH, 1   ;function# 1

    INPUT:
    INT 21H
    MOV BH, AL  ;1st input in BH

    INT 21H
    MOV CH, AL  ;2nd input in CH

    INT 21H
    MOV DH, AL  ;3rd input in DH

    OUTPUT:
    MOV AH, 2   ;function# 2

    MOV DL, 0AH ;ascii of newline
    INT 21H
    MOV DL, 0DH ;ascii of cret
    INT 21H

    MOV DL, CH  ;display the 2nd input
    INT 21H

    EXIT:
    MOV AH, 4CH
    INT 21H

```