Roll No: 11
Name: Soham Desai
Xavier ID : 202003021
Date: 6/4/22

EXPERIMENT 10

Aim: Compute the factorial of a positive integer 'n' using recursive procedure

LO: 5

LO STATEMENT: Write programs based on string and procedure for 8086 microprocessor

Software and Hardware Requirements: TASM Software

Theory:

1. MOV Instruction

The MOV instruction is the most important command in the 8086 because it moves data from one location to another. It also has the widest variety of parameters; so the assembler programmer can use MOV effectively, the rest of the commands are easier to understand. MOV copies the data in the source to the destination. The data can be either a byte or a word. Sometimes this has to be explicitly stated when the assembler cannot determine from the operands whether a byte or word is being referenced.

Syntax:
Move Destination, Source

Example:
MOV Ax, Bx

2. INT instruction:

Interrupt is the method of creating a temporary halt during program execution and allows peripheral devices to access the microprocessor. The microprocessor responds to that interrupt with an ISR (lnterrupt Service Routine), which is a short program to instruct the microprocessor on how to handle the interrupt.

Example:

INT 21H

3. INC Instruction:

The INC instruction adds one to the destination operand, while preserving the state of the carry flag CF. The destination operand can be a register or a memory location. This instruction allows a loop counter to be updated without disturbing the CF flag.

Syntax:

INC destination

4. JMP Instruction:

Conditional execution often involves a transfer of control to the address of an instruction that does not follow the currently executing instruction. Transfer of control may be forward, to execute a new set of instructions or backward, to re-execute the same steps. The JMP instruction provides a label name where the flow of control is transferred immediately.

Syntax:

JMP label

Example:

JMP next

5. LEA Instruction:

LEA is Used to load the address of operand into the provided register. LES Used to load ES register and other provided register from the memory. The lea instruction places the address specified by its first operand into the register specified by its second operand. Note, the contents of the memory location are not loaded, only the effective address is computed and placed into the register.

6. CMP Instruction:

The cmp instruction is used to perform comparison. It's identical to the sub instruction except it does not affect operands. It impacts the Zero Flag (ZF) as well as the Carry Flag (CF)

Syntax:

cmp destination, source

7. JNZ instruction:

The jnz (or jne) instruction is a conditional jump that follows a test. It jumps to the specified location if the Zero Flag (ZF) is cleared (0). jnz is commonly used to explicitly test for something not being equal to zero whereas jne is commonly found after a cmp instruction.

Syntax:

jnz location

Code:

```
assume ds:data , cs:code

data segment

n1 db 0ah,0dh,'Enter string:$'

n2 db 0ah,0dh,'string is pallindrome$'

n3 db 0ah,0dh,'string is not pallindrome$'

buff db 06h

    db 00h

    db 50h

data ends

print macro msg

mov ah,09h

lea dx,msg

int 21h

endm

code segment

start:

Mov ax,data

mov ds,ax

print n1

mov ah,0ah

lea dx,buff

int 21h

lea bx,buff+2

mov ch,00h

mov cl,buff+1
```

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```
mov di,cx

dec di

mov si,00h

shr cl,01h

back:

mov al,[bx+si]

mov ah,[bx+di]

cmp al,ah

jnz last

dec di

inc si

dec cx

jnz back

print n2

jmp final

last:

print n3

final:

mov ah,4ch

int 21h

code ends

end start
```

Output:

Conclusion:

From this experiment we have studied have to use various instructions like jnz and buff and also how to find out if a string is palindrome or not in 8086.