



اسم المادة: Advanced computer technology

اسم المعيدة : ضحى علي طالب

المرحلة :الرابعة

السنة الدراسية : 2024-2025

عنوان المحاضرة: (3) The Instruction Set of 8086



Logic Instruction :

- **AND instruction**

This instruction applies to two operands and the following algorithm is applied to them:

1-Converts both parameters to 0 and 1

2- Apply the following algorithm: These rules apply:

$$1 \text{ AND } 1 = 1$$

$$1 \text{ AND } 0 = 0$$

$$0 \text{ AND } 1 = 0$$

$$0 \text{ AND } 0 = 0$$

-Return the result to the 16 th system

Example:

AL=87 → 1000 0111

BL=F1 → 1111 0001

AL $\overline{1000 \ 0001} = 81$

Org 100h

Mov AL , 2

Mov BL , 10

And AL ,BL

Ret



اسم المادة: Advanced computer technology

اسم المعيدة : ضحى علي طالب

المرحلة :الرابعة

السنة الدراسية : 2024-2025

عنوان المحاضرة: (3) The Instruction Set of 8086



- **OR instruction**

This instruction applies to two operands and the following algorithm is applied to them:

1 - Converts both parameters to 0 and 1

2 - Apply the following algorithm:

These rules apply:

$$1 \text{ OR } 1 = 1$$

$$1 \text{ OR } 0 = 1$$

$$0 \text{ OR } 1 = 1$$

$$0 \text{ OR } 0 = 0$$

- Return the result to the 16 th system

Example:

AL= 02 → 1000 0010

CH=F1 → 1111 0001

AL 1111 0011 = F3

```
Org 100h
Mov ax, 08102h
Mov cx, 0f12ah
Or AL , CH
Ret
```



اسم المادة: Advanced computer technology

اسم المعيدة : ضحى علي طالب

المرحلة :الرابعة

السنة الدراسية : 2024-2025

عنوان المحاضرة: (3) The Instruction Set of 8086



XOR instruction

This instruction applies to two operands and the following algorithm is applied to them:

1 - Converts both parameters to 0 and 1

2 - Apply the following algorithm:

These rules apply:

$$1 \text{ XOR } 1 = 0$$

$$1 \text{ XOR } 0 = 1$$

$$0 \text{ XOR } 1 = 1$$

$$0 \text{ XOR } 0 = 0$$

-Return the result to the 16 th system

Example:

Org 100h

MOV AL , AFh

MOV BL , F0h

XOR BL

RET



اسم المادة: Advanced computer technology

اسم المعيدة : ضحى علي طالب

المرحلة :الرابعة

السنة الدراسية : 2024-2025

عنوان المحاضرة: (3) The Instruction Set of 8086



Rotate instructions

- **Rotate left through carry (RCL) :**

carry flag goes to the right, and the bits shift to the left, so the last bit on the left becomes carry flag

Example:

Org 100 h

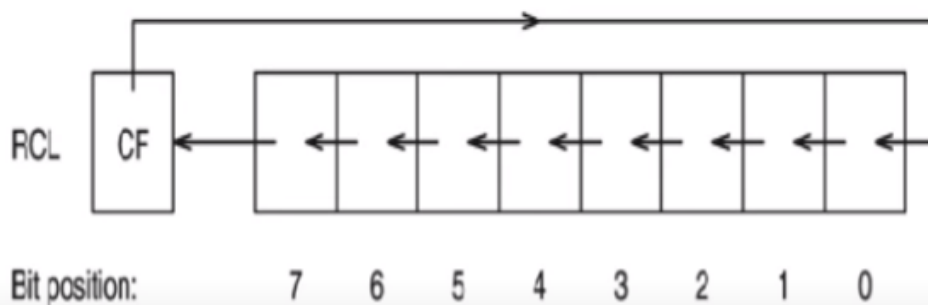
STC ; set carry (CF= 1)

MOV AL, 1 Ch ; AL = 0 0011100

RCL AL, 1 ; AL = 0011100 1 , CF=0

RET

RCL





Advanced computer technology: اسم المادة

اسم المعيدة : ضحى علي طالب

المرحلة :الرابعة

السنة الدراسية : 2025-2024

عنوان المحاضرة: (3) The Instruction Set of 8086



- **Rotate right through carry (RCR) :**

carry flag goes to the left, and the bits shift to the right, so the last bit on the right becomes carry flag

Example:

Org 100h

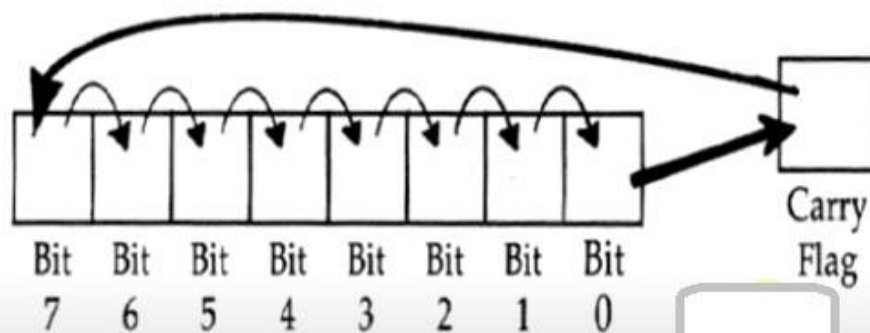
STC ; set carry (CF=1)

MOV AL, 1Ch ; AL = 00011100

RCR AL, 1 ; AL = 10001110b, CF=0

RET

RCR





Advanced computer technology: اسم المادة

اسم المعيدة : ضحى علي طالب

المرحلة :الرابعة

السنة الدراسية : 2025-2024

عنوان المحاضرة: (3) The Instruction Set of 8086



- Rotate left (ROL) :

The last bit on the left side goes to the last bit on the right. Thus all bits are shifted to the left. And the last bit from the left after shifting (outside) is the carry flag

Example:

Org 100h

MOV AL , 1Ch ; AL=0001 1100

ROL AL , 1; AL=0011 1000 , CF=0

RET



Example:

Org 100h

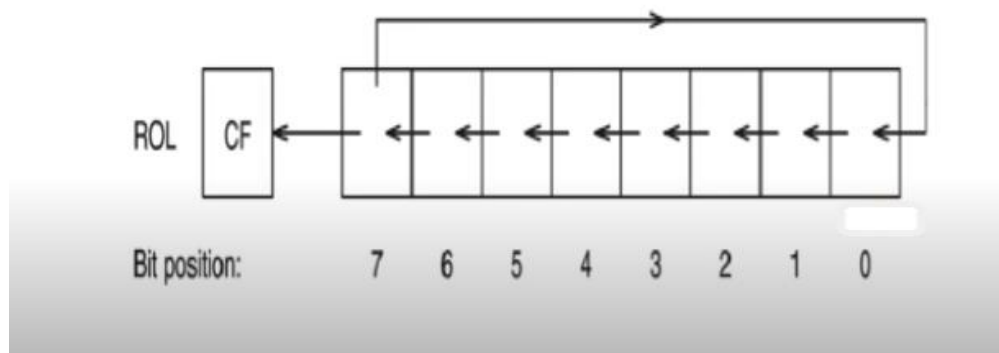
MOV AL , B4h ; Al=1011 0100

ROL AL , 1 ; Al=0110 1001 ,CF=1

RET



ROL





اسم المادة: Advanced computer technology

اسم المعيدة : ضحى علي طالب

المرحلة:الرابعة

السنة الدراسية : 2024-2025

عنوان المحاضرة: (3) The Instruction Set of 8086



- **Rotate right (ROR) :**

The last bit on the right side goes to the last bit on the left. Thus all bits are shifted to the right.

And the last bit from the right after shifting (outside) is the carry flag

Example

Org 100h

MOV AL, 1Ch ; AL = 00011100b

ROR AL, 1 ; AL = 00001110b, CF=0

RET

ROR

