CEN 214 Microprocessors
Lab Assignment 9
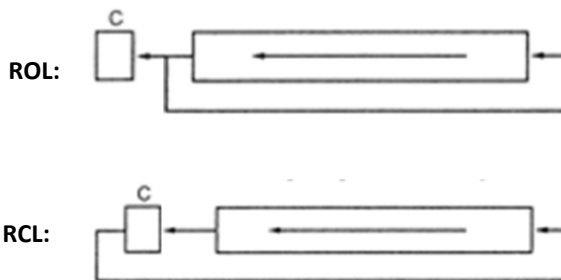
New Instructions:

ROL,RCL

Description: The rotate left (ROL) and rotate through carry left (RCL) instructions shift all the bits toward more significant bit positions, except for the most-significant bit, which is rotated to the least-significant bit location.

The RCL instruction include the CF flag in the rotation. The RCL instruction shifts the CF flag into the least-significant bit and shifts the most-significant bit into the CF flag. The ROL instruction, the original value of the CF flag is not a part of the result, but the CF flag receives a copy of the bit that was shifted from one end to the other.

Algorithm

ROL:

RCL:

ROR,RCR

Description: The rotate right (ROR) and rotate through carry right (RCR) instructions shift all the bits toward less significant bit positions, except for the least-significant bit, which is rotated to the most-significant bit location. The RCR instructions include the CF flag in the rotation. The ROR instructions, the original value of the CF flag is not a part of the result, but the CF flag receives a copy of the bit that was shifted from one end to the other.

Algorithm:

ROR:

RCR:
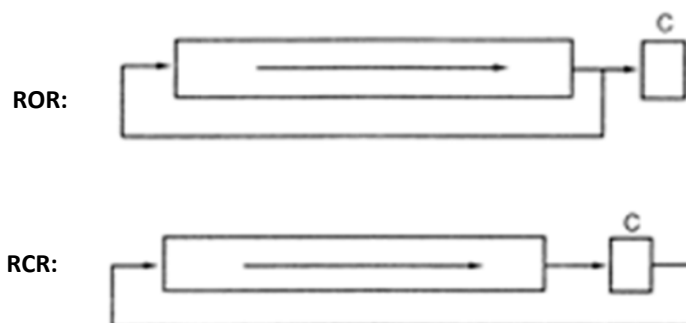
Examples:

1. Write a program that reads a word from 0100:0300h memory address and count the 1s (ones) in this value. Then write count to DX.

2. Write a program that rotate the word stored at 0100:0300h memory address to left until it will be negative and save the rotation count in CX. If the last value is bigger than signed value A100h then write AAh to 0100:1000h, if not write BBh to 0100:1000h.

3. Write a program that rotate DX-BX-AX register combination to left for 4 times. Later, write result to memory address starting 0100:5000h.