**Assembly Sec C Lab 6 Fall 2017**

**Mul**

For Unsigned number

mov ax,10

mov bx,5

mul bx ; DX:AX = 00000032h, CF=0

The Carry flag indicates whether or not the upper half of the product contains significant digits.

**Div**

mov dx,0

mov ax, 50 ; dividend

mov cx, 5 ; divisor

div cx

; AX = 000Ah, DX = 0000

Answer is in AX

Reminder is in DX

**Task 1**

Write a program that calculate the following series:

Where r and l are variables. If r =2 and l = 8 then final answer is 4C

**Task 2**

Write the main program that that allocates two arrays (same size, size should be greater than 1 and less than 255) of 8-bit unsigned numbersand calculates their scalar product (n is size). Multiplication result of two 8 bit unsigned numbers can be greater than 8 bit. **(You are not allowed to use any 16 bit register)**

**Task 3**

Encryption and Decryption algorithms are very commonly used in Network Security. Your task is to write code for Encryption algorithm written below

Encryption

There is a 32 bit PlainText and a 32 bit Encryption Key. Use the key to perform 4 rounds to encrypt Text.

In 1st round, Take the key,

1. complement every 2nd bit, starting from 1st bit
2. Rotate Left
3. Add key to the plaintext

In 2nd round, take the updated key

1. Complement every 2nd bit starting from 2nd bit
2. Rotate Right
3. Add to the text obtained from round 1

. In 3rd round, take the updated key

1. Complement every 2nd bit starting from 2nd bit
2. Rotate Left
3. Add to the text obtained from round 2

In 4th round, take updated key from round 3

1. Complement every 2nd bit starting from 2nd bit
2. Rotate Right
3. Add to text obtained from round 3

Example

Plaintext: 15D3 C2 57

Key: 23 CD E6 89

*Round 1*

KEY: 0010 0011 1100 1101 1110 0110 1000 1001

Bit cpl: 1000 1001 0110 0111 0100 1100 0010 0011

Rotate left: 00010010 1100 1110 1001 1000 01000111

Resultant key in hex 12CE9847

Result after addition Plain text: 28A25A9E

*Round 2*

KEY: 00010010110011101001100001000111

Bit cpl: 0100 0111 1001 1011 1100 1101 0001 0010

Rotate Right: 0010 0011 1100 1101 1110 0110 1000 1001

Resultant key in hex 23CDE689

Result after addition Plain text: 4C704127

*Round 3*

KEY: 0010 0011 1100 1101 1110 0110 1000 1001

Bit cpl: 1000 1001 0110 0111 0100 1100 0010 0011

Rotate left: 0001 0010 1100 1110 1001 1000 0100 0111

Resultant key in hex 12CE9847

Result after addition Plain text: 5F3ED96E

*Round 4*

KEY: 00010010110011101001100001000111

Bit cpl: 0100 0111 1001 1011 1100 1101 0001 0010

Rotate Right: 0010 0011 1100 1101 1110 0110 1000 1001

Resultant key in hex 23CDE689

Result after addition Plain text: 830CBFF7