**EE2003: Computer Organization**

**Assignment – 1**

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**Question (P12):**

Write a program to multiply two positive numbers by a repeated addition method. For example, to multiply 5 X 4, the program evaluates the product by adding 5 four times.

Use this to implement following expression:

**(A x B) + (C x D)**

**Logic Used:**

I have used 2 loops, one for each multiplication.

For performing (A x B), the steps used are:

* Take the negative of A and store in CNT.
  + Actually taking compliment and adding 1 to A gives us a number in which if original A is added then due to overflow, all the bits set to 0.
  + So in some sense we can use this concept as a counting mechanism to be used in loops
* Keep adding B to the accumulator and incrementing CNT until CNT is 0.

Similarly repeat for the second multiplication (C x D).

**Program:**

LDA A

CMA

INC

STA CNT

CLA

LOOP1,

ADD B

ISZ CNT

BUN LOOP1

STA RESULT

LDA C

CMA

INC

STA CNT

LDA RESULT

LOOP2,

ADD D

ISZ CNT

BUN LOOP2

STA RESULT

HLT

**Inputs:**

A, HEX 0002

B, HEX 0007

C, HEX 0004

D, HEX 0003

CNT, HEX 0000

RESULT, HEX 0000

**Result:**

001A {(2 x 7) + (4 x 3) = Dec 26 = Hex 001A}

**Output:**

