**Homework 5**

**Note: 這次Lab是作loop 的練習, 請不要使用pow函數, 請不要使用陣列.**

**(This homework designed for the loop practice. Please do not use array or pow function)**

**1.** Write a program to approximate the value of e using the formula:

e **= 1 +  +  +  +…**

**(a). Stop when the added term is less than 10.**

(b). Stop when the difference between the two successive terms is less than 0.001.

2. Write a program to approximate the value of sin(x) using the formula:



(值由keyboard key in ).

The program stop when < (含絕對值)

3. Write a program that prompts the user to input a positive integer and then outputs the individual digits of the number.

**( while loop only )**

4. Write a program to convert binary numbers to decimal.

(First you can decompose a binary number into separate digits.)

5. In cryptarithmetic puzzles, mathematical equations are written using letters. Each letter can be a digit from 0 to 9, but no two letters can be the same. Here is a sample problem:

SEND + MORE = MONEY (9567+ 1085 = =10652)

A solution to the puzzle is

S = 9, R = 8, O = 0, M = 1, Y = 2, E = 5, N = 6, D = 7

Question:

Write a program that finds solutions to the cryptarithmetic puzzle of:

TOO + TOO + TOO + TOO = GOOD

The simplest technique is to use a nested loop for each unique letter (in this

case T, O, G, D). The loops would systematically assign the digits from 0-9

to each letter.

For example,

it might first try T = 0, O = 0, G = 0, D = 0, then

T = 0, O = 0, G =0, D = 1, then

T = 0, O = 0, G = 0, D = 2, etc. up to

T = 9, O = 9, G = 9, D = 9.

In the loop body test that each variable is unique and that the equation

is satisfied.

Output the values for the letters that satisfy the equation.