**Homework 3**

**1**. Write programs to accumulate and print the following:

( where *n* reads from the keyboard)

Note: **Use only one Loop**

**(a).** **20 +22 + 24 +…+ 2**

**(b). 1 +  +  +. . .+ **

**(c). 1 +  +  + . . .+ **

**(d). 1－2 + 3 －4 + 5 + . . . + *n***

**(e). 1+ (1+2) + (1+2+3) +(1+2+3+4) +…+(1+2+3+…+ *n*)**

**2.** Write a program that reads an integer and converts it to multiples of 50,

20, 10, and 1. For example, if the user enters the number 285, the program

should display 5\*50, 1\*20, 1\*10, 5\*1.

Case 1: Use at most 6 variables.

Case 2: Use only one variable.

3. Write a program that reads an eight-digit positive integer:

Add the first, third, fifth, seventh digits.

Add the second, fourth, sixth, eight digits.

Multiply the first sum by 2 and add it to the second sum.

Subtract 1 from the total.

Compute the remainder when the total is divided by 10.

Subtract the remainder from 9

Please display the final result.

**4.** A polynomial ax+ a x+ … + a can be evaluated(計值)

方法(A). In a straightforward way by performing the indicated operations and using power function.

方法(B). An alternative method is to factor the polynomial according to the following formula, known as HORNER’S Rule:

(…( ( ax + a ) x + a) x + …+ a ) + a

(1). Write two programs to evaluate polynomials by these two different methods.

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(2). Please compare these two methods.

(方法A,B需幾次的乘算及加算)

**Ex: f(x)=5x+4x+3x+2x+1 ( input x from keyboard)**

**方法(B): let a=1, a=2, a=3, a=4, a=5**

**We have : f= a, f= f \* x + a, f= f \* x + a, f= f\* x + a**

**f = f \* x + a = 5x+4x+3x+2x+1 ------->Answer**

**( In general form f = f\*x + a , f=a )**

**5.** A common highway patro speed-detection radar unit emits a beam of microwaves at a frequency . The beam is reflected off an approaching car, and the reflected beam is picked up and analyzed by the radar unit. The frequency of the reflected beam is shifted slightly from to  due to the motion of the car. The relationship between the speed of the car, *v*, in miles per hour and the two microwave frequencies is

*v* = (6.685 ) 

Where the emitted waves have a frequency of = 2   .

(a).Using this formula, write a program to calculate and display the speed corresponding to a received frequency of 2.0000004   

(b). Modify the above program to determine the frequency that will be returned by a car traveling at 55 miles per hour.