- INTRODUCTION TO COMPUTER SYSTEMS (Chapter 1)
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  - I/O operators **cin** & **cout**
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- SETECTION STRUCTURES (Chapter 4)
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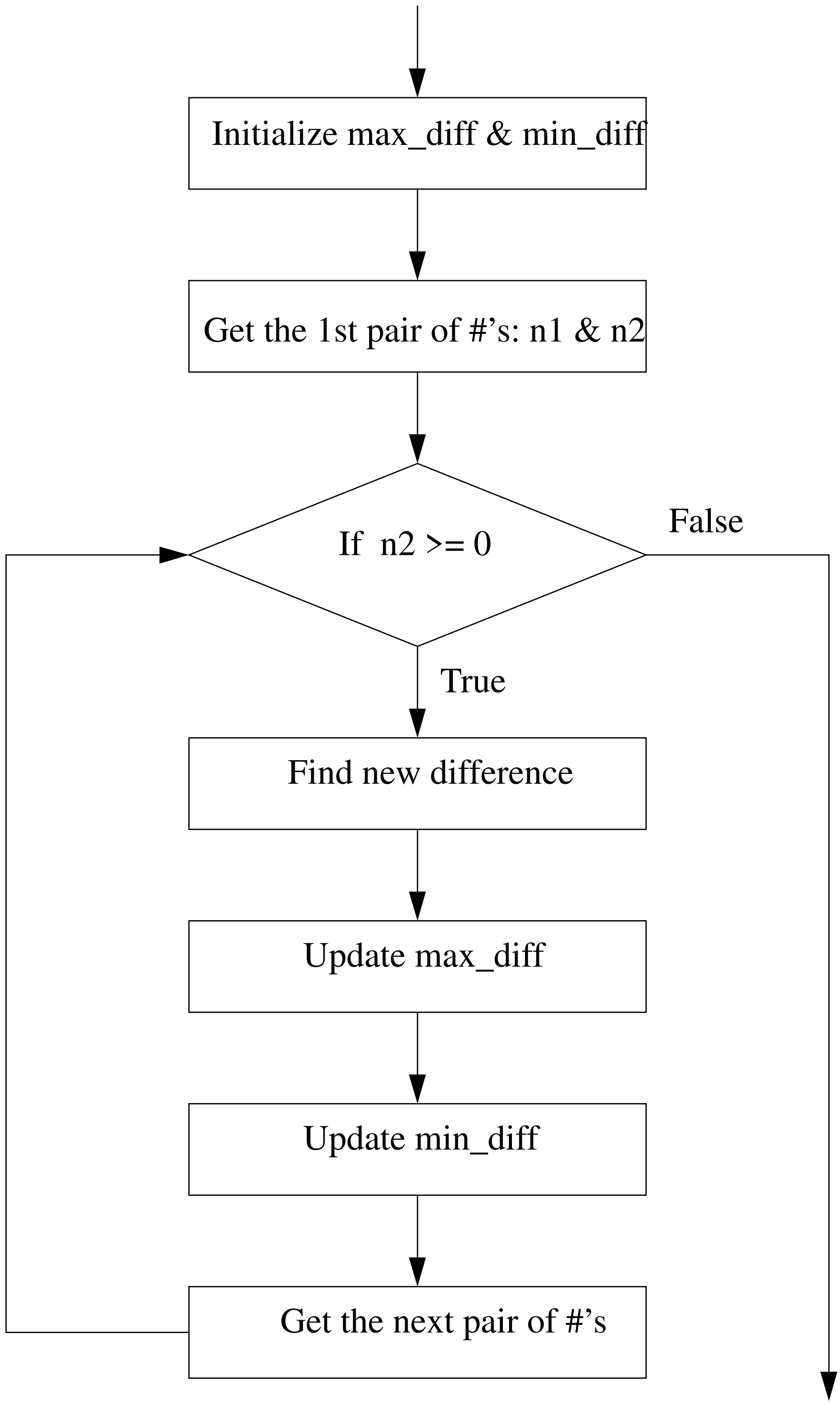
  - Functions & procedures
  - Argument Passing: pass-by-value & pass-by-reference

Given a sequence of positive numbers, find the largest and smallest differences between two succeeding numbers. The input sequence is terminated by a negative number.



Example:

```
// Given a sequence of numbers, find the largest and
// smallest differences between two succeeding numbers.
// Input: a sequence of numbers (terminates by -ve)
// Output: max_diff - largest difference
//            min_diff - smallest difference

#include <iostream.h>
#include <math.h>

void main ( ) {
    float no1, no2, diff, max_diff=0, min_diff=100;

    cout << "Enter numbers: ";
    cin >> no1 >> no2;

    while (no2 >= 0) {
        diff = abs ( no1 - no2 );
        if ( diff > max_diff ) max_diff = diff;
        if ( diff < min_diff ) min_diff = diff;

        no1 = no2;
        cin >> no2;
    }

    cout << "Largest different: " << max_diff << endl;
    cout << "Smallest different: " << min_diff << endl;
}
```

Ex. Which of the following are legal identifiers?

i. Start
ii. for
iii. 34Tuv
iv. illegal
v. "identifier"

a. i, iv
b. i, iii and iv
c. i, ii and iv
d. i, iii and iv
e. all of the above

Ex. Suppose Flag is an integer variable.

The statement Flag = 5 < 5;

a. causes a syntax error
b. assign Flag the value 0
c. assign Flag the value 1
d. assign Flag the value 5
e. none of the above

Ex. Complete the following program such that it reads an integer value (assumed to be positive and less than 100) and outputs one of the following messages

```
if (the value contains the digit 7)
    output  buzz
else  if (the value is a multiple of 7)
        output  buzz-buzz
     else  output the value itself
```

```
#include <iostream.h>

void main( )  {
        int i;

        cin >> i;
        if ______________________________

            cout << "buzz" << endl;

        else  if ___________________________

              cout << "buzz-buzz" << endl;

             else cout << i;

}
```

Ex. How many times does this program sequence display Hello ?

```
for (i = 3 ;i >= 0; i--)    {

      j = i;
      do {
            cout << "Hello" << endl;
            j--;
      } while (j >= 0);
}
```

Ex. Complete the program which reads an integer n and calculate the sum of the series

$$1^1 + 2^2 + 3^3 + \dots + n^n$$

```
#include <iostream.h>

void main( ) {
      int n,x,power,i,sum;

      cin >> n;

      sum=_____;

      for (x=_______; x ________; ________) {

            power=1;
            for (i=1; i <=_______; i++)

                  power = _________________;
             sum = sum + power;
      }
      cout << sum;
}
```

Ex. The following function is supposed to return X to the power Y:

```
int power ( int x, int y ) {

       int temp, count;

      for (count=1; count<=y; count++)
            temp = temp * x;

       return (temp);
}
```

You may assume that X and Y are integers greater than 0. Does the function has any bug? If yes, state the bug(s) and fix it(them).