

Functions:

_ Write C++ program to calculate the squared value of a number passed from main function. Use this function in a program to calculate the squares of numbers from 1 to 10:

```
#include<iostream.h>
int square ( int y )
{
    int z;
    z = y * y;
    return ( z );
}
void main( )
{
    int x;
    for ( x=1; x <= 10; x++ )
        cout << square ( x ) << endl;
}
```

_ Write C++ program using function to calculate the average of two numbers entered by the user in the main program:

```
#include<iostream.h>
float aver (int x1, int x2)
{
    float z;
    z = ( x1 + x2 ) / 2.0;
    return ( z );
}
void main( )
{
    float x;
    int num1,num2;
    cout << "Enter 2 positive number \n";
    cin >> num1 >> num2;
    x = aver (num1, num2);
    cout << x;
}
```

_ Write C++ program, using function, to find the summation of the following series:

$$\sum_{i=1}^n i^2 = 1^2 + 2^2 + 3^2 + \dots + n^2$$

```
#include<iostream.h>
```

```

int summation ( int x)
{
int i = 1, sum = 0;
while ( i <= x )
{
sum += i * i ;
i++;
}
return (sum);
}
void main ( )
{
int n ,s;
cout << "enter positive number";
cin >> n;
s = summation ( n );
cout << "sum is: " << s << endl;
}

```

_ Write a function to find the largest integer among three integers entered by the user in the main function.

```

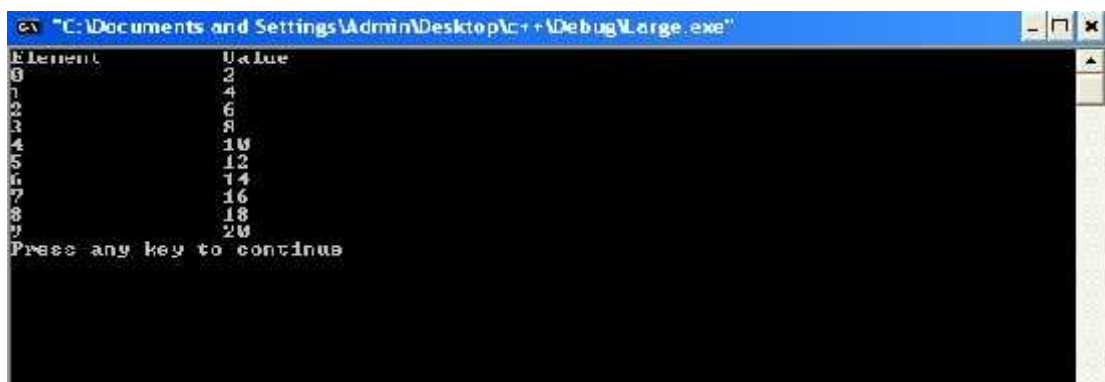
#include <iostream.h>
int max(int y1, int y2, int y3)
{
int big;
big=y1;
if (y2>big) big=y2;
if (y3>big) big=y3;
return (big);
}
void main( )
{
int largest,x1,x2,x3;
cout<<"Enter 3 integer numbers:";
cin>>x1>>x2>>x3;
largest=max(x1,x2,x3);
cout<<largest;
}

```

-Array one Dimension-

Example: Initialize array s to the even integers from 2 to 20.

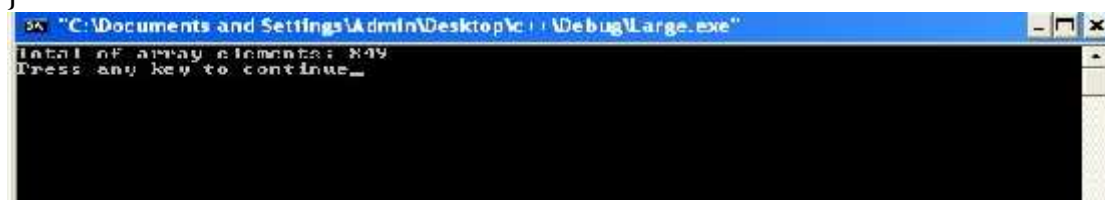
```
#include<iostream.h>
void main( )
{
    const int arraySize = 10;
    int s[ arraySize ];
    for ( int i = 0; i < arraySize; i++ )
        s[ i ] = 2 + 2 * i;
    cout << "Element\t\t" <<"Value" << endl;
    for ( int j = 0; j < arraySize; j++ )
        cout <<j << "\t\t" << s[ j ] << endl;
}
```



Element	Value
0	2
1	4
2	6
3	8
4	10
5	12
6	14
7	16
8	18
9	20

Example: Compute the sum of the elements of an array.

```
#include<iostream.h>
void main( )
{
    const int arraySize = 10;
    int a[ arraySize ] = { 87, 68, 94, 100, 83, 78, 85, 91, 76, 87 };
    int total = 0;
    for ( int i = 0; i < arraySize; i++ )
        total += a[ i ];
    cout << "Total of array elements: " << total << endl;
}
```



Example: Write C++ program, to find the maximum value in array of 8 numbers:

```
#include<iostream.h>
```

```
void main ( )
```

```
{
```

```
    int n = 8;
```

```
    int a [ ] = { 18, 25, 36, 44, 12, 60, 75, 89 };
```

```
    int max = a [ 0 ];
```

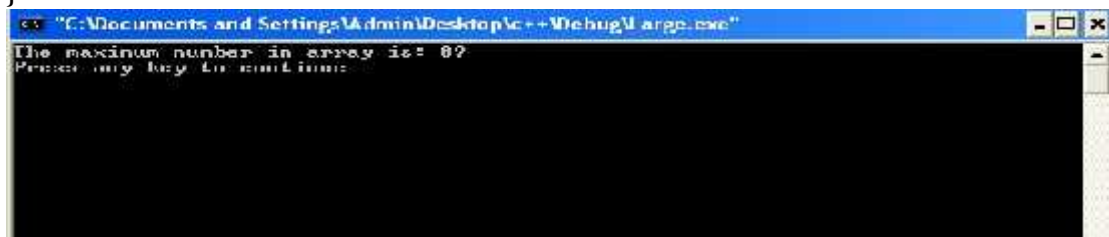
```
    for ( int i = 0; i < n; i++ )
```

```
        if ( a [ i ] > max ) max = a [ i ];
```

```
        cout << "The maximum number in array is: " <<
```

```
max<<endl;
```

```
}
```



Example: Write C++ program, using function, to find X value in array, and return the index of its location:

```
#include<iostream.h>
```

```
int search( int a[ ], int y)
```

```
{
```

```
    int i = 0;
```

```
    while ( a [ i ] != y )
```

```
        i++;
```

```
    return ( i );
```

```
}
```

```
void main ( )
```

```
{
```

```
    int X, f;
```

```
    int a [ 10 ] = { 18, 25, 36, 44, 12, 60, 75, 89, 10, 50 };
```

```
    cout << "enter value to find it: ";
```

```
    cin >> X;
```

```
    f = search (a, X);
```

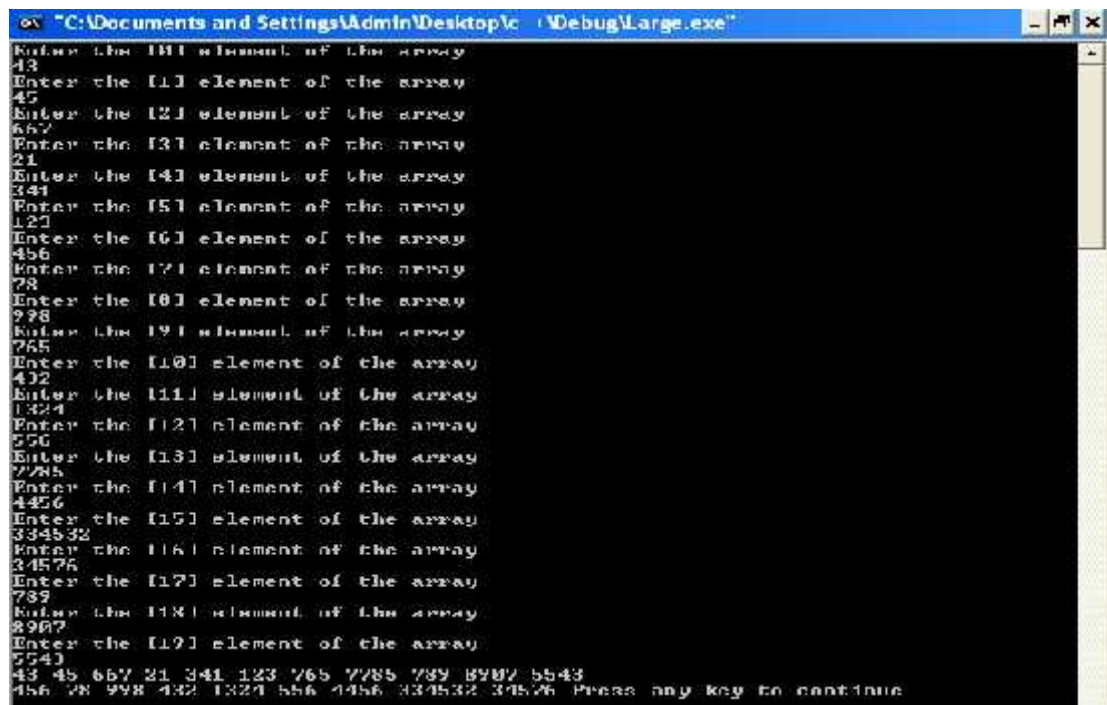
```
    cout << "the value " << X << " is found in location " << f << endl;
```

```
}
```



Example: Write C++ program, to split the odd numbers and even numbers of one array into two arrays:

```
#include<iostream.h>
void main ( )
{
    int a [ 20 ];
    int aodd[20], aeven [20];
    int i ,o=0, e=0;
    for ( i=0 ; i<20; i++ )
    {
        cout<<"Enter the ["<< i <<"] element of the array"<<endl;
        cin>> a[i];
    }
    for ( i=0 ; i<20; i++ )
        if (a[i] % 2 !=0)
        {
            aodd[o]=a[i];
            o=o+1;
        }
        else
        {
            aeven[e]=a[i];
            e=e+1;
        }
    for ( i=0 ; i<o; i++ )
        cout<<aodd[i]<<" ";
    cout<<endl;
    for ( i=0 ; i<e; i++ )
        cout<<aeven[i]<<" ";
}
```



```
C:\Documents and Settings\Admin\Desktop\c++\Debug\Large.exe
Enter the 1st element of the array
13
Enter the 11 element of the array
45
Enter the 12 element of the array
667
Enter the 13 element of the array
21
Enter the 14 element of the array
341
Enter the 15 element of the array
123
Enter the 16 element of the array
456
Enter the 17 element of the array
78
Enter the 18 element of the array
998
Enter the 19 element of the array
765
Enter the 110 element of the array
432
Enter the 111 element of the array
1324
Enter the 112 element of the array
556
Enter the 113 element of the array
7785
Enter the 114 element of the array
4456
Enter the 115 element of the array
334532
Enter the 116 element of the array
34576
Enter the 117 element of the array
789
Enter the 118 element of the array
8907
Enter the 119 element of the array
5543
13 45 667 21 341 123 765 7785 789 8907 5543
456 78 998 432 1324 556 4456 334532 34576 Press any key to continue
```

Example: Sorting an array with insertion sort.

// This program sorts an array's values into ascending order.

#include <iostream.h>

void main()

{

const int arraySize = 10; // size of array a

int a[arraySize] = { 2, 6, 4, 8, 10, 12, 89, 68, 45, 37 };

int hold; // temporary location used to swap array elements

cout << "Data items in original order\n";

// output original array

for (int i = 0; i < arraySize; i++)

cout << " " << a[i];

// bubble sort

// loop to control number of passes

for (int pass = 0; pass < arraySize-1 ; pass++)

// loop to control number of comparisons per pass

for (int j = 0; j < arraySize - 1; j++)

// compare side-by-side elements and swap them if

// first element is greater than second element

```

        if ( a[ j ] > a[ j + 1 ] ) {
            hold = a[ j ];
            a[ j ] = a[ j + 1 ];
            a[ j + 1 ] = hold;

        } // end if

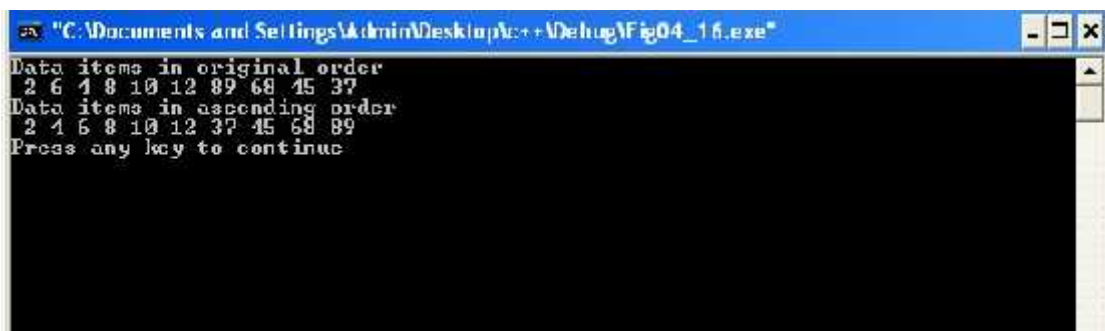
    cout << "\nData items in ascending order\n";

    // output sorted array
    for ( int k = 0; k < arraySize; k++ )
        cout << " " << a[ k ];

    cout << endl;

} // end main

```



```

"C:\Documents and Settings\Admin\Desktop\Ac++\Debug\Fig04_16.exe"
Data items in original order
 2 6 4 8 10 12 89 68 45 37
Data items in ascending order
 2 4 6 8 10 12 37 45 68 89
Press any key to continue

```