```
// Swap no. s using Pass by Reference
#include<iostream>
#include<conio.h>
using namespace std;
void swap (int &, int &);
void main ()
{
	int a, b;
	cout << "Enter Value Of A:";
	cin >> a;
	cout << "Enter Value of B:";
	cin >> b;
	cout << "Before swapping\nValue of A is " << a << "\nValue of B is " << b;
	swap (a, b);
	cout << "\nOutside function after swapping\nValue of A is" << a << "\nValue of B
is" << b;
	_getch ();
}
void swap (int &a, int &b)
{
	int c;
	c = a;
	a = b;
	b = c;
	cout << "\nInside function after swapping\nValue of A is" << a << "\nValue of B
is" << b;
}
/* Output:
Enter Value Of A:20
Enter Value of B:30
Before swapping
Value of A is 20
Value of B is 30
Inside function after swapping
Value of A is30
Value of B is20
Outside function after swapping
Value of A is30
Value of B is20
*/
```

```
// Swap using pointers

#include <iostream>
#include<conio.h>
using namespace std;
void swapvalue (int *a, int *b)
{
	int temp;
	temp = *a;
	*a = *b;
	*b = temp;

}
void main ()
{
	int a, b;
	cout << "Enter two numbers: \n";
	cin >> a >> b;
	swapvalue (&a, &b);
    cout << "After swapping first and second number is " << a << " " << b;
	_getch ();
}
/* Output:
Enter two numbers:
12
123
After swapping first and second number is 123 12
*/
```

```
// To find smallest no. using min () function
#include <iostream>
#include <algorithm>
#include<conio.h>
using namespace std;
int main ()
{
	int a, b, c, d;
	cout << "Enter any 4 integers" << "\n";
	cin >> a >> b >> c >> d;
	cout << "The smallest integer entered is:";
	cout << min ({a, b, c, d}) << "\n";
	_getch ();
}
/* Output:
Enter any 4 integers
13
43
45
56
The smallest integer entered is :13
*/
```

```
// To find the largest no. using max () function
#include <iostream>
#include <algorithm>
#include<conio.h>
using namespace std;
int main ()
{
	int a, b, c, d;
	cout << "Enter any 4 integers" << "\n";
	cin >> a >> b >> c >> d;
	cout << "The largest integer entered is:";
	cout << max ({a, b, c, d}) << "\n";
	_getch ();
}
/* Output:
Enter any 4 integers
12
123
1234
12345
The largest integer entered is :12345
*/
```

```
//To calculate the Surface Area and Volume of a sphere

#include<iostream>
#include<conio.h>
using namespace std;
float const pi = 3.14;
void cal (float &vol, float &surface_area, int r)
{
	vol = (4* pi*r*r*r)/3;
	surface_area = 4 * pi*r*r;
}
void main ()
{
	int r;
	float vol, surface_area;
	cout << "Enter the radius of sphere:";
	cin >> r;
	cal (vol, surface_area, r);
	cout << "Volume of sphere is:" << vol << endl;
	cout << "Surface area of sphere is:" << surface_area << endl;
	_getch ();
}
/* Output:
Enter the radius of sphere :10
Volume of sphere is :4186.67
Surface area of sphere is :1256
*/
```

```
//To print the Fibonacci series less than n
#include<iostream>
#include<conio.h>
using namespace std;
void main ()
{
	int i, no, first = 0, second = 1, next;
	first = 0;
	second = 1;
	cout << "Enter number of terms for Series: ";
	cin >> no;
	cout << "Fibonacci series are: \n";
	cout << " " << "0" << " " << "1";
	for (i = 0; i<(no*100); i++)
	{
	mylabel:
		next = first + second;

		if (next <= no)
		{
			cout <<" "<<next<<" ";
			first = second;
			second = next;
		}
		else goto mylabel;
		}
	_getch ();
}
/* Output:
Enter number of terms for Series: 35
Fibonacci series are:
0 1 1 2 3 5 8 13 21 34
*/
```

```
// Print Fibonacci Series till n terms
#include <iostream>
#include<conio.h>
using namespace std;
void main ()
{
	int n, t1 = 0, t2 = 1, nextTerm = 0;
	cout << "Enter the number of terms: ";
	cin >> n;
	cout << "Fibonacci Series: ";
	for (int i = 1; i <= n; ++i)
	{
		// Prints the first two terms.
		if (i == 1)
		{
			cout << " " << t1<<" ";
			continue;
		}
		if (i == 2)
		{
			cout << t2 << " ";
			continue;
		}
		nextTerm = t1 + t2;
		t1 = t2;
		t2 = nextTerm;
		cout << nextTerm << " ";
	}
	_getch ();
}
/* Output:
Enter the number of terms: 10
Fibonacci Series:  0 1 1 2 3 5 8 13 21 34
*/
```

```
//To Enter a string and right align it.
#include <iostream>
#include<conio.h>
#include <iomanip>
using namespace std;
void main ()
{
	char str [100];
	cout << "Enter a String:";
	cin. getline(str,100);
	std: cout << std: right << std: setw (100) << str << endl;
	_getch ();
}
/*Output:
Enter a String: Hello, I am Alan.
                                                                    Hello, I am Alan.
*/
```

```
//To accept a string from keyboard and copy without any string library functions. Display
both.

#include<iostream>
#include<conio.h>
#include<string.h>
#include<stdio.h>
using namespace std;
void main ()
{
	char strs1[100];
	char strs2[100];
	int i;
	cout << "Write a sentence: ";
	cin. getline (strs1, 100);
	cout << "The original string is:" << strs1 << endl;
	for (i = 0; strs1[i]! = '\0'; ++i)
	{
		strs2[i] = strs1[i];
	}
	for (i = 0; i <= 100; i++)
	{
		strs2[i] = strs1[i];
	}
	cout << "The copied string is:" << strs2 << endl;
	_getch ();
}
/* Output:
Write a sentence: I am Alan, the first born of Biju George.
The original string is: I am Alan, the first born of Biju George.
The copied string is: I am Alan, the first born of Biju George.
*/


// To replace all space with Hyphens
#include<iostream>
#include<conio.h>
#include<string.h>
using namespace std;
void main ()
{
	char str [80];
	cout << "Enter a String:";
	cin. getline (str, 80);
	for (int i = 0; i < strlen(str); i++)
	{
		if (str[i] == ' ')
		{
			str[i] = '-';
		}
	}
	cout << "New String:" << str;
	_getch ();
}
/* Output:
Enter a String: My name is Khan and I am not a terrorist
New String: My-name-is-Khan-and-I-am-not-a-terrorist
*/
```

```
// To reverse a string and display both
#include<iostream>
#include<conio.h>
#include<string.h>
using namespace std;
void main ()
{
	char str [100];
	char reversed [100];
	cout << "Enter a New String:";
	cin >> str;
	strcpy_s (reversed, str);
	_strrev(reversed);
	cout << "The Reversed is:" << reversed;
	_getch ();
}
/* Output:
Enter a New String: David
The Reversed is: divaD
*/
```

```
// To accept string from keyboard and print each character in a new line in reverse
order.

#include<iostream>
#include<conio.h>
#include<string.h>
using namespace std;
void main ()
{
	char str [15], temp;
	int i, j;
	cout << "Enter a string of 15 characters: ";
	cin. getline(str,15);
	j = strlen(str) - 1;
	for (i = 0; i < j; i++, j--)
	{
		temp = str[i];
		str[i] = str[j];
		str[j] = temp;
	}
	cout << "\nReverse string: " << endl;
	for (i = 0; i < 15; i++)
	{
		cout << str[i] << endl;
	}
	_getch ();
}
/* Output:
Enter a string: I am Alan Biju

Reverse string:
u
j
i
B

n
a
l
A

m
a

I
*/
```

```
//To accept a string from keyboard and check whether palindrome or not.

#include<iostream>
#include<conio.h>
#include<string.h>
using namespace std;
void main ()
{
	char str [50];
	char rev [50];
	cout << "Enter the String:";
	cin >> str;
	strcpy_s (rev, str);
	_strrev(rev);
	if (strcmp (str, rev) == 0)
	{
		cout << "It's a palindrome";
	}
	else
	{
		cout << "It's not a palindrome";
	}
	_getch ();
}
/* Output:
Enter the String: Hello
It's not a palindrome
Enter the String: Malayalam
It's a palindrome
*/

// C++ program to count occurrences of a 'J'
#include <iostream>
#include<conio.h>
#include <string>
using namespace std;
int count (string s, char c, char d)
{
	int res = 0;
	for (int i = 0; i<s. length (); i++)
		if (s[i] == c|| s[i]==d)
			res++;
	return res;
}
void main ()
{
	char str [50];
	cout << "Enter the string:";
	cin. getline (str, 50);
	char c = 'j', d ='J';
	cout << count (str, c, d) << endl;
	_getch ();
}
/* Output:
Enter the string: Jack and Jill went to Jodhpur for some jockstraps and jockeys.
4
*/
```

```
//To find maximum and minimum of an array and tell their position
#include<iostream>
#include<conio.h>
using namespace std;
void main ()
{
	double numbers [10];
	int i, max, min, pmax, pmin;
	cout << "Enter 10 no. s" << endl;
	for (i = 0; i < 10; i++)
	{
		cin >> numbers[i];
	}
	max = numbers [0];
	for (i = 1; i < 10; i++)
	{
		if (max < numbers[i])
		{
			max = numbers[i];
			pmax = i;
		}
	}
	min = numbers [0];
	for (i = 1; i < 10; i++)
	{
		if (min > numbers[i])
		{
			min = numbers[i];
			pmin = i;
		}
	}
	cout << "The maximum no. is:" << max << " at position:" << pmax + 1 << endl;
	cout << "The minimum no. is:" << min << " at position:" << pmin + 1 << endl;
	_getch ();
}
/* Output:
Enter 10 no. s
1 2 3 4 5 6 7 8 9 0
The maximum no. is :9 at position :9
The minimum no. is :0 at position :10
*/
```

```
//To find the LCM and HCF of 2 no. s
#include<iostream>
#include<conio.h>
using namespace std;
void main ()
{
	int a, b, c;
	cout << "Enter 2 no. s:" << endl;
	cin >> a >> b;
	c = a * b;
	while (a! = b)
	{
		if (a > b)
		{
			a = a - b;
		}
		else
		{
			b = b - a;
		}
	}
	cout << "HCF:" << a << endl;
	cout << "LCM:" << c / a << endl;
	_getch ();
}
/* Output:
Enter 2 no. s:
10
25
HCF :5
LCM :50
*/
```

```
// To find the factorial of a no. using int fact(int)
#include<iostream>
#include<conio.h>
using namespace std;
int fact (int n)
{
	if (n == 1)
	{
		return 1;
	}
	else
	{
		return n * fact (n - 1);
	}
}
void main ()
{
	int n, result;
	cout << "Enter the no.:";
	cin >> n;
	result = fact(n);
	cout << "The factorial is:" << result;
	_getch ();
}
/* Output:
Enter the no. :10
The factorial is :3628800
*/
```

```
// TO print the start, end address of the elements of the array
#include<iostream>
#include<conio.h>
using namespace std;
void main ()
{
	int n [10];
	int *ptr, sum = 0, i;
	cout << "Enter 10 no. s:" << endl;
	for (i = 0; i < 10; i++)
	{
		cin >> n[i];
	}
	ptr = n;
	cout << "\n Start Add. \t Size \t	End Add. \t	Value" << endl;
	for (i = 0; i < 10; i++)
	{
		sum = sum + *ptr;
		cout << "\n\n" << ptr << "\t\t" << sizeof(*ptr) << "\t";
		ptr = ptr + 1;
		cout << ptr << "\t\t" << sum;
	}
	_getch ();
}
/* Output:
Enter 10 no. s:
1 2 3 4 5 6 7 8 9 10
Start Add.		Size		End Add.		Value
001BFC60		4		001BFC64		1

001BFC64		4		001BFC68		3

001BFC68		4		001BFC6C		6

001BFC6C		4		001BFC70		10

001BFC70		4		001BFC74		15

001BFC74		4		001BFC78		21

001BFC78		4		001BFC7C		28

001BFC7C		4		001BFC80		36

001BFC80		4		001BFC84		45

001BFC84		4		001BFC88		55
*/
```

```
// To read a line of text and count the no. of words in it.
#include<iostream>
#include<conio.h>
#include<string.h>
#include<stdio.h>
using namespace std;
void main ()
{
	char strs [100], countw = 0, strw [15];
	int i, len;
	cout << "Write a sentence: ";
	cin. getline(strs,100);
	len = strlen(strs);
	for (i = 0; i<=len; i++)
	{
		if (strs[i] == ' ')
		{
			countw++;
		}
	}
	cout << "Total number of words in the sentence is " << countw + 1;
	_getch ();
}
/* Output:
Write a sentence: My name is Khan and I am not a terrorist.
Total number of words in the sentence is 10
*/

//To test whether a no. is Prime or not
#include <iostream>
#include<conio.h>
using namespace std;
void main ()
{
	int n, i;
	bool isPrime = true;
	cout << "Enter a positive integer: ";
	cin >> n;
    for (i = 2; i <= n / 2; ++i)
	{
		if (n % i == 0)
		{
			isPrime = false;
			break;
		}
	}
	if (isPrime)
		cout << "This is a prime number";
	else
		cout << "This is not a prime number";
_getch ();
}
/* Output:
Enter a positive integer: 19
This is a prime number
Enter a positive integer: 20
This is not a prime number
*/
```

```
//To sort 10 no. s using bubble sort
#include<iostream>
#include<conio.h>
using namespace std;
void main ()
{
	int n=10, i, arr [50], j, temp;
	cout << "Enter " << n << " numbers:"<<endl;
	for (i = 0; i<n; i++)
	{
		cin >> arr[i];
	}
	cout << "Sorting array using bubble sort technique...\n";
	for (i = 0; i< (n - 1); i++)
	{
		for (j = 0; j< (n - i - 1); j++)
		{
			if (arr[j]>arr [j + 1])
			{
				temp = arr[j];
				arr[j] = arr [j + 1];
				arr [j + 1] = temp;
			}
		}
	}
	cout << "Elements sorted successfully...!!\n";
	cout << "Sorted list in ascending order:\n";
	for (i = 0; i<n; i++)
	{
		cout << arr[i] << " ";
	}
	_getch ();
}
/* Output:
Enter total number of elements :5
Enter 5 numbers :1 123 12 12345 1234
Sorting array using bubble sort technique...
Elements sorted successfully...!!
Sorted list in ascending order:
1 12 123 1234 12345
*/
```

```
// To search element in the list from user using linear search
#include<iostream>
#include<conio.h>
using namespace std;
void main ()
{
	int arr [10], i, num, n, c = 0, pos;
	cout << "Enter the array size: ";
	cin >> n;
	cout << "Enter Array Elements: ";
	for (i = 0; i<n; i++)
	{
		cin >> arr[i];
	}
	cout << "Enter the number to be search: ";
	cin >> num;
	for (i = 0; i<n; i++)
	{
		if (arr[i] == num)
		{
			c = 1;
			pos = i + 1;
			break;
		}
	}
	if (c == 0)
	{
		cout << "Number not found...!!";
	}
	else
	{
		cout << num << " found at position " << pos;
	}
	_getch ();
}
/* Output:
Enter the array size: 5
Enter Array Elements: 1 12 123 1234 12345
Enter the number to be search: 123
123 found at position 3*/
```

```
// To search an element in the list from user through binary search
#include<iostream>
#include<conio.h>
using namespace std;
void main ()
{
	int n, i, arr [50], search, first, last, middle;
	cout << "Enter total number of elements:"<< endl;
	cin >> n;
	cout << "Enter " << n << " number:" << endl;
	for (i = 0; i<n; i++)
	{
		cin >> arr[i];
	}
	cout << "Enter a number to find:" << endl;
	cin >> search;
	first = 0;
	last = n - 1;
	middle = (first + last) / 2;
	while (first <= last)
	{
		if (arr[middle] < search)
		{
			first = middle + 1;

		}
		else if (arr[middle] == search)
		{
			cout << search << " found at location " << middle + 1 << "\n";
			break;
		}
		else
		{
			last = middle - 1;
		}
		middle = (first + last) / 2;
	}
	if (first > last)
	{
		cout << "Not found! " << search << " is not present in the list.";
	}
	_getch ();
}
/* Output:
Enter total number of elements :5
Enter 5 number: 1 12 123 1234 12345
Enter a number to find: 1234
1234 found at location 4
*/
```

```
//To convert binary no. to decimal no. using void convert ()
#include <iostream>
#include <cmath>
#include<conio.h>
using namespace std;
void convert (long long, int &decimalNumber);
void main ()
{
	long long n;
	int decimalNumber = 0;
	cout << "Enter a binary number: ";
	cin >> n;
	cout << n << " in binary = ";
	convert (n, decimalNumber);
		cout<<decimalNumber<< " in decimal.";
	_getch ();
}
void convert (long long n, int &decimalNumber)
{
	int i = 0, remainder;
	while (n! = 0)
	{
		remainder = n % 10;
		n /= 10;
		decimalNumber += remainder * pow (2, i);
		++i;
	}
}
/* Output:
Enter a binary number: 1100
1100 in binary = 12 in decimal.
*/
```

```
//To find the largest in the given array using pointers
#include<iostream>
#include<conio.h>
using namespace std;
int max (int*, int);
void main ()
{
	int a [10];
	cout << "Enter 10 no. s:" << endl;
	for (int i = 0; i < 10; i++)
	{
		cin >> a[i];
	}
	int size = sizeof(a) / sizeof a [0];
	cout <<"The maximum in the array is:"<< max (a, size);
	_getch ();
}
int max (int *ptr, int size)
{
	int max;
	max = ptr [0];
	for (int i = 0; i < size; i++)
	{
		if (max< ptr[i])
		{
			max = ptr[i];
		}
	}
	return max;
}
/* Output:
Enter 10 no. s:
0 1 2 3 4 5 6 7 8 9
The maximum in the array is :9
*/
```