Exercises

1. Write a program which accept temperature in Fahrenheit and print it in centigrade.
   Solution:

```
1
2   #include<iostream>
3   using namespace std;
4
5   int main()
6   {
7       float F,C;
8       cout<< "\nEnter temperature in Farenheit : ";
9       cin>>F;
10      C=5*(F-32)/9;
11      cout<<"Temperature in celcius is : "<<C;
12
13
14      return 0;
15  }
16
17
```

2. Write a program which accepts a character and display its ASCII value.

```
1
2   #include<iostream>
3   using namespace std;
4
5   int main()
6   {
7       char ch;
8       cout<<"\nEnter any character : ";
9       cin>>ch;
10      cout<<"ASCII equivalent is : "<<static_cast<int>(ch);
11
12
13      return 0;
14  }
15
16
```

3. Write a program which accepts a character and display its next character.

```
#include<iostream>
using namespace std;

int main()
{
    char ch;
    cout<< "\nEnter any character : ";
    cin>>ch;
    ch++;
    cout<<"Next character is : "<<ch;


    return 0;
}
```

4. Write a program which accepts days as integer and display total number of years, months and days in it.
for example : If user input as 856 days the output should be 2 years 4 months 6 days.

```
#include<iostream>
using namespace std;

int main()
{
    int days,y,m,d;
    cout<<"Enter no. of days : ";
    cin>>days;
    y=days/365;
    days=days%365;
    m=days/30;
    d=days%30;
    cout<<"Years : "<<y<<"\nMonths : "<<m<<"\nDays : "<<d;


    return 0;
}
```

5. Write a program that takes length as input in feet and inches. The program should then convert the lengths in centimeters and display it on screen. Assume that the given lengths in feet and inches are integers.

   Based on the problem, you need to design an algorithm as follows:
   1. Get the length in feet and inches.
   2. Convert the length into total inches.
   3. Convert total inches into centimeters.
   4. Output centimeters.

```cpp
#include <iostream> //Header file
using namespace std;

const double CENTIMETERS_PER_INCH = 2.54;   //Named constants
const int INCHES_PER_FOOT = 12;         //Named constants


int main ()
{
    int feet, inches;
    int totalInches;
    double centimeter;
    cout << "Enter two integers, one for feet and one for inches: ";
    cin >> feet >> inches;
    cout << endl;
    cout << "The numbers you entered are " << feet << " for feet and " << inches << " for inches. " << endl;
    totalInches = INCHES_PER_FOOT * feet + inches;
    cout << "The total number of inches = " << totalInches << endl;
    centimeter = CENTIMETERS_PER_INCH * totalInches;
    cout << "The number of centimeters = " << centimeter << endl;
    return 0;
}

```

6. Any character is entered by the user; write a program to determine whether the character entered is a capital letter, a small case letter, a digit or a special symbol. The following table shows the range of ASCII values for various characters.

Characters	ASCII Values
A – Z	65 – 90
a – z	97 – 122
0 – 9	48 – 57
special symbols	0 - 47, 58 - 64, 91 - 96, 123 – 127

```
1
2   #include<iostream>
3   using namespace std;
4
5   int main ()
6   {
7       char ch;
8       cout<<"Enter any character:";
9       cin>>ch;
10
11      if (ch>=65 && ch<=90)
12          cout<<"Character is a capital letter";
13      else if (ch>=97 && ch<=122)
14          cout<<"Character is a small letter";
15      else if (ch>=48 && ch<=57)
16          cout<<"Character is a digit";
17      else if ((ch>0 && ch<=47)||(ch>=58 && ch<=64)||
18                  (ch>=91 && ch<=96)||(ch>=123 && ch<=127))
19          cout<<"Character is a special symbol";
20
21
22      return 0;
23  }
```

7. Write a program to calculate the sum of first 10 natural number.

```cpp
#include<iostream>
using namespace std;

int main()
{
    int i=1,sum=0;

    while(i<=10)
    {
        sum+=i;
        i++;
    }

    cout<<"Sum :"<<sum;


    return 0;
}
```

8. Write a program to find the factorial value of any number entered through the keyboard.

```cpp
#include<iostream>
using namespace std;

int main()
{
    int n,fact=1;
    cout<<"Enter the number :";
    cin>>n;

    while(n>=1)
    {
        fact*=n;
        n--;
    }

    cout<<"Factorial :"<<fact;


    return 0;
}

```

9. Write a program to print Fibonacci series of n terms where n is input by user: 0 1 1 2 3 5 8 13 21...

9. Write a program to print Fibonacci series of n terms where is input by user: 0 1 1 2 3 5 8 13 21…

```cpp
#include<iostream>
using namespace std;


int main()
{
    int f=0,s=1,t,n;

    cout<<"Enter Number of terms of Series : ";
    cin>>n;

    cout<<f<<" "<<s<<" ";

    for(int i=3;i<=n;i++)
    {
        t=f+s;
        cout<<t<<" ";
        f=s;
        s=t;
    }


    return 0;
}

```

10. Write a program to calculate the sum of following series

where n is input by user.
1 + 1/2 + 1/3 + 1/4 + 1/5 +.....1/n

```cpp
#include<iostream>
using namespace std;

int main()
{
    int i,n;
    float sum=0;

    cout<<"Enter the value of n ";
    cin>>n;

    for(i=1;i<=n;i++)
        sum += 1.0/i;

    cout<<"Sum : "<<sum;


    return 0;
}
```

11. Write a program to check character entered is alphabet, digit or special character using library functions.

12. Write a program which display a number between 10 to 100 randomly

13. Write a program which accept a letter and display it in uppercase letter.
14. Write a function that receives two numbers as an argument and display all prime numbers between these two numbers. Call this function from main ( ).

15. Write a program that lets the user perform arithmetic operations on two numbers. Your program must be menu driven, allowing the user to select the operation (+, -, *, or /) and input the numbers. Furthermore, your program must consist of following functions:

    1. **Function showChoice**: This function shows the options to the user and explains how to enter data.
    2. **Function add**: This function accepts two number as arguments and returns sum.
    3. **Function subtract:** This function accepts two number as arguments and returns their difference.
    4. **Function mulitiply:** This function accepts two number as arguments and returns product.
    5. **Function divide:** This function accepts two number as arguments and returns quotient.

16. Write a program to print following

i)
```
**********
**********
**********
**********
```

ii)
```
*
**
***
****
*****
```

iii)
```
    *
   **
  ***
 ****
*****
```

iv)
```
    *
   ***
  *****
 *******
*********
```

v)
```
    1
   222
  33333
 4444444
555555555
```

vi)
```
    1
   212
  32123
 4321234
543212345
```

i) Solution

```
1  #include<iostream>
2  using namespace std;
3
4  int main()
5  {
6      int i,j;
7      for(i=1;i<=4;i++)
8      {
9          for(j=1;j<=10;j++)
10             cout<<'*';
11         cout<<endl;
12     }
13
14
15     return 0;
16 }
17
```

ii)

```
#include<iostream>
using namespace std;

int main()
{
    int i,j;
    for(i=1;i<=5;i++)
    {
        for(j=1;j<=i;j++)
            cout<<'*';
        cout<<endl;
    }


    return 0;
}

```

iii)

```
#include<iostream>
using namespace std;

int main()
{
    int i,j,k;
    for(i=1;i<=5;i++)
    {
        for(j=5;j>i;j--)
            cout<<' ';
        for(k=1;k<=i;k++)
            cout<<'*';
        cout<<endl;
    }


    return 0;
}

```

iv)

```
#include<iostream>
using namespace std;

int main()
{
    int i,j,k;
    for(i=1;i<=5;i++)
    {
        for(j=5;j>i;j--)
            cout<<' ';
        for(k=1;k<2*i;k++)
            cout<<'*';
        cout<<endl;
    }


    return 0;
}

```

v)

```
#include<iostream>
using namespace std;

int main()
{
    int i,j,k;
    for(i=1;i<=5;i++)
    {
        for(j=5;j>i;j--)
            cout<<' ';
        for(k=1;k<2*i;k++)
            cout<<i;
        cout<<endl;
    }


    return 0;
}

```

vi)

```cpp
#include<iostream>
using namespace std;

int main()
{
    int i,j,k,l;
    for(i=1;i<=5;i++)
    {
        for(j=5;j>i;j--)
            cout<<' ';
        for(k=i;k>=1;k--)
            cout<<k;
        for(l=2;l<=i;l++)
            cout<<l;
        cout<<endl;
    }


    return 0;
}
```

Output

```cpp
#include <iostream>
using namespace std;

void X(int &A, int &B)
{
   A = A + B;
   B = A - B;
   A = A - B;
}

int main()
{
   int a = 4, b = 18;
   X(a,b);
   cout << a << ", " << b;

   return 0;}
```

```
#include <iostream>
using namespace std;

void Execute(int &B, int C = 100)
{
   int temp = B + C;
   B += temp;
   if (C == 100)
      cout << temp << " " << B << " " << C << endl;
}

int main()
{
   int M = 90, N = 10;
   Execute(M);
   cout << M << " " << N << endl;
   Execute(M, N);
   cout << M << " " << N << endl;

   return 0;
}
```

```
#include <iostream>
using namespace std;

int global = 10;

void func(int &x, int y)
{
   x = x - y;
   y = x * 10;
   cout << x << ", " << y << '\n';
}

int main()
{
   int global = 7;
   func (::global, global);
```

```
    cout << global << ", " << ::global << '\n';

    func(global, ::global);
    cout << global << ", " << ::global << '\n';

    return 0;
}
```

```
#include <iostream>
using namespace std;

int func(int &x, int y = 10)
{
    if (x % y == 0)
        return ++x;
    else
        return y--;
}

int main()
{
    int p = 20, q = 23;

    q = func(p, q);
    cout << p << " " << " " << q << endl;

    p = func (q);
    cout << p << " " << " " << q << endl;

    q = func (p);
    cout << p << " " << " " << q << endl;

    return 0;
}
```