Task 1: Multiplication without *

```
#include<iostream>
using namespace std;
int main()
{
      int num1,num2,product = 0;
      cout<<"please enter the first number : ";
      cin>>num1;
      while(num1<0)
   {
      cout << "Invalid input! " << endl << "Please enter the first number again : " ;
      cin >> num1 ;
   }
            cout<<"please enter the second number : ";
         cin>>num2;
      while(num2<0)
   {
      cout << "Invalid input! " << endl << "Please enter the second number again : " ;
      cin >> num2 ;
   }
   while(num2>0)
   {
      product = product + num1;
      num2--;
   }
      cout<<"Product is = "<<product;
      return 0;
}
```

Task 2: Division without /

```
#include<iostream>
using namespace std;
int main()
{
      int  dividend , divisor,i = 0 ,rem ;
      cout<<" Please enter the positive dividend : ";
      cin>>dividend ;
      while(dividend<0)
      {
            cout<<" Invalid Input! "<<endl;
            cout<<" Enter dividend again : ";
            cin>>dividend;

      }

      cout<<" Please enter the positive divisor : ";
      cin>>divisor ;
      while(divisor<0)
      {
            cout<<" Invalid Input! "<<endl;
            cout<<" Enter divisor again : ";
            cin>>divisor;

      }
      while(divisor>dividend)
      {
```

```
        cout<<" Invalid Input!"<<endl<<" Enter divisor again : ";
        cin>>divisor;

    }
    while(dividend>=divisor)
    {
        dividend=dividend-divisor;
        rem=dividend;
        i++;
    }

    cout<<" Remainder is = "<<rem<<endl;
    cout<<" Quotient is = "<<i;
}
```

Task 3: Addition by Hand

```
#include<iostream>
using namespace std;
int main()
{
    int num1, num2, total = 0, i = 1, carry = 0, remNum1, remNum2, sum, remainder;
    cout << " Please enter the first positive numbers : ";
    cin >> num1;
    while (num1 < 0)
    {

       cout << " Invalid Input!" << endl << " Enter number again : ";
        cin >> num1;

    }

        cout << " Please enter the second positive numbers : ";
        cin >> num2;

    while (num2 < 0)
    {

        cout << " Invalid Input!" << endl << " Enter number again : ";
        cin >> num2;

    }
        cout << "     "<< num1<< endl;
     cout<<" + " << "    "<< num2<< endl;
     cout << "--------------" << endl;
    while (num1 != 0 || num2 != 0)
    {

        remNum1 = num1 % 10;
        remNum2 = num2 % 10;
        sum = remNum1 + remNum2 + carry;
        if (sum > 9)
        {
            remainder = sum % 10;
            carry = sum / 10;
            total += (remainder * i);
        }
```

```
        else
        {
            total += (sum * i);
            carry = 0;
        }
            i *= 10;
            num1 /= 10;
            num2 /= 10;
        }
        total += (carry * i);

        cout <<"     "<< total;
        return 0;
}
```

Task 4: Binary Addition

```
#include<iostream>
#include<cmath>
using namespace std;
int main()
{
    int num1, num2, carry = 0, sum = 0, i = 0, result = 0;
    cout << " Please enter first binary number : ";
    cin >> num1;
    cout << " Please enter second binary number : ";
    cin >> num2;
    cout << "      " << num1 << endl;
    cout << " + " << "     " << num2 << endl;
    cout << "  " <<"------------" << endl;
    while (num1 != 0 || num2 != 0)
    {
        if ((num1 % 10 == 0) && (num2 % 10 == 0) && (carry == 0))
        {
            sum = 0;
            carry = 0;
        }
        else if ((num1 % 10 == 1) && (num2 % 10 == 0) && (carry == 0))
        {
            sum = 1;
            carry = 0;
        }
        else if ((num1 % 10 == 1) && (num2 % 10 == 1) && (carry == 0))
        {
            sum = 0;
            carry = 1;
        }
        else if ((num1 % 10 == 1) && (num2 % 10 == 1) && (carry == 1))
        {
            sum = 1;
            carry = 1;
        }

        else if ((num1 % 10 == 1) && (num2 % 10 == 0) && (carry == 1))
        {
            sum = 0;
            carry = 1;
        }
```

```
        else if ((num1 % 10 == 0) && (num2 % 10 == 1) && (carry == 1))
        {
            sum = 0;
            carry = 1;
        }
       else if ((num1 % 10 == 0) && (num2 % 10 == 1) && (carry == 0))
        {
            sum = 1;
            carry = 0;
        }
        else if ((num1 % 10 == 0) && (num2 % 10 == 0) && (carry == 1))
        {
            sum = 1;
            carry = 0;
        }
        result += sum * pow(10, i);
        i++;
        num1 /= 10;
        num2 /= 10;
    }
    if (carry == 1)
    {
        result += pow(10, i);
    }
    cout << "     " << result;
    return 0;
}
```

Task 5: Prime Number

```
#include<iostream>
using namespace std;
int main()
{
    int i ,num ;
    cout<<" Please enter the positive number :";
    cin>>num;
    for(i = 2 ; i<=(num-1); i++)
    {
        if(num%i==0)
        {
            cout<<" "<<num<<" is not a Prime Number.";
            break;

        }
    }
    if(i==num)
    {
     cout<<" "<<num <<" is Prime number.";
    }

    return 0;
}
```

Task 6: Twin Primes

```
#include<iostream>
using namespace std;
int main()
{
	int num1, num2= 2, k = 0, c = 0;
	cout << "Enter a Positive Integer: ";
	cin >> num1;
	cout << "Twin Primes between 2 and " << num1 << " are: " << endl;
	while (num2 <= num1)
	{
		num2++;
		for (int i = 2; i < num2; i++)
		{
			if (num2 % i == 0)
			{
				break;
			}
			else if (num2 - i == 1)
			{
				k = num2 - c;
				if (k == 2)
				{
					cout << "(" << c << "," << num2 << ")"  << endl;
				}
				c = num2;
			}
		}
	}
	return 0;
}
```

Task 7: LCM

```
#include<iostream>
using namespace std;
int main()
{
	int n1, n2, k, lcm;
	cout << " Enter first number: ";
	cin >> n1;
	if (n1 < 0)
	{
		cout << " Invalid Input! Enter first number again: ";
		cin >> n1;
	}
	cout << " Enter Second number:";
	cin >> n2;
	for (int i = 1; i <= n1 && i <= n2; i++)
	{
		if (n1 % i == 0 && n2 % i == 0)
		{
			k = i;
		}
	}
	lcm = (n1 * n2) / k;
```

```
	cout << " The LCM is  = " << lcm;
	return 0;
}
```

Task 8: Digit, Alphabet, Others

```
#include<iostream>
using namespace std;
int main()
{
	char choice, value;
	do
	{
	cout << " Enter a Character: ";
	cin >>choice;
	if (choice >= 65 &&choice <= 90)
	{
		cout << " It is a capital Alphabet! " << endl;
	}
	else if (choice >= 97 && choice <= 122)
	{
		cout << " It is a small Alphabet! " << endl;
	}
	else if (choice >= 48 && choice <= 57)
	{
		cout << " It is a Digit! " << endl;
	}
	else
	{
		cout << " It is some other Character! " << endl;
	}
	cout << " Do you want to enter again(Y/N):";
	cin >> value;
	}while (value == 'y' || value == 'Y');
	return 0;
}
```

Task 9: Encryption/Decryption

```
#include<iostream>
#include<string>
using namespace std;
int main()
{
		string msg, encryptedMsg, decryptedMsg;
		int k;
		cout << "Enter a Message: ";
		getline(cin, msg);
		cout << "Enter a positive integer: ";
		cin >> k;
		for (int i = 0; i <= msg.length(); i++)
		{
			msg[i] = msg[i] + k;

		}
		   encryptedMsg = msg ;
		cout <<"Encrypted Message:" <<encryptedMsg<<endl;
```

```
        for (int i = 0; i < msg.length(); i++)
        {
              msg[i] = msg[i] - k;

        }
          decryptedMsg = msg ;
        cout<<"Decrypted Message:" << decryptedMsg;

        return 0;
    }
```

Task 10: anbn

```
#include<iostream>
#include<string>
using namespace std;
int main()
{

   int a = 0, b = 0;
   string str;
      cout << " Enter a String: ";
      getline(cin, str);
   for (int i = 0; i < str.length(); i++)
   {
      if (str[i]=='b' && str[i+1]=='a')
      {
           break;
           }
           else if (str[i] == 'a')
         a++;
      else
      {
         b++;
      }
   }
   if (a == b)
   {
      cout << " It is a valid string. ";
   }
   else
   {
      cout << " It is an invalid string. ";
   }
   return 0;
}
```

Task 11: CGPA Calculator

```
#include<iostream>
#include<string>
using  namespace std;
int main()
{
	string name,college;
	int roll, noOfSem, k = 12;
	float gpa, cgpa,b=0,sum = 0;
	cout << " Enter your Name: ";
	getline (cin, name);
	cout << " Enter your Roll Number: ";
	cin >> roll;
	cin.ignore();
	while (roll < 0)
	{
		cout << "Error! Enter again: ";
		cin >> roll;
		cin.ignore();
	}
	cout << " Enter Your College Name: ";
	getline(cin , college);

	cout << " Enter Number of Semesters: ";
	cin >> noOfSem;
	while (noOfSem < 1 || noOfSem > 8)
	{
		cout << " Error! Enter Number of Semesters again: ";
		cin >> noOfSem;
	}
	for (int i = 1; i <= noOfSem; i++)
	{
		cout << "Enter gpa of " << i <<" semester: ";
		cin >> gpa;
		while (gpa < 0 || gpa > 4)
		{
			cout << "Erros! Enter Your  GPA again: ";
			cin >> gpa;
		}
			sum =sum + (gpa*k);
			b = b+k;
			k++;
			cgpa = (sum/b);


	}

	cout << " ****** Result Card***** "<<endl;
	cout << name<< endl;
	cout << college << endl;
	cout << "CGPA : " <<cgpa << endl;

	return 0;
}
```

Task 12: Fist bump Counter

```
#include<iostream>
using namespace std;
int main()
{
      int n,result;
      cout<<" Enter Number of Group Members : ";
      cin>>n;
      result = n*(n-1)/2;
   cout<<" Total Fist bumps are  : "<<result;

}
```

Task 13: Corresponding Number Finder

```
#include<iostream>
using namespace std;
int main()
{
      int n1,d,n2,numS1,count=0,a=1,s1C;
      cout<<" Enter first number of Series 1 : ";
      cin>>n1;
      cout<<" Enter the difference of Series 1 : ";
      cin>>d;
      cout<<" Enter first number of Series 2 : ";
      cin>>n2;
      cout<<" Enter number from the Series 1 : ";
      cin>>numS1;
      while(n1<=numS1)
      {
        n1=n1+d;
           count++;

      }

      while(a<count)
      {
           a++;
           n2++;
      }

      s1C=n2;
      cout<<" Your  Corresponding  Number  is : "<<s1C;
}
```

Task 14: Toggle String

```
#include <iostream>
#include <string>

using namespace std;
int main()
{
   string str, toggledStr;
   cout << "  Enter a sentence : ";
   getline(cin, str);
   for (int i = 0; i <= str[i]; i++)
   {
      if (str[i] >= 97 && str[i] <= 122)
      {
         str[i] = str[i] - 32;
      }
      else if (str[i] >= 65 && str[i] <= 90)
      {
         str[i] = str[i] + 32;
      }

   }
   toggledStr = str;
   cout << " Toggled sentence is = " << toggledStr;
   return 0;
}
```

Task 15: 2D Palindrome

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

int main()
{
      string str1, str2, str3, str4, str5;
      cout << "Enter 1st String: ";
      cin >> str1;
      cout << "Enter 2nd String: ";
      cin >> str2;
      cout << "Enter 3rd String: ";
      cin >> str3;
      cout << "Enter 4st String: ";
      cin >> str4;
      cout << "Enter 5st String: ";
      cin >> str5;
      while (str1.length() != 5 || str2.length() != 5 || str3.length() != 5 || str4.length() != 5 ||
str5.length() != 5)
      {
            cout << "ERROR! Invalid Input!\n";
            cout << "Please Enter a word of length 5";
            cout << "Enter 1st String: ";
         cin >> str1;
```

```
        cout << "Enter 2nd String: ";
        cin >> str2;
        cout << "Enter 3rd String: ";
        cin >> str3;
        cout << "Enter 4st String: ";
        cin >> str4;
        cout << "Enter 5st String: ";
        cin >> str5;
    }

    bool palindrome = true;
    for (int i = 0; i < 5; i++)
    {
        if (str1[i] != str5[4 - i])
        {
            palindrome = false;
        }
        if (str2[i] != str4[4 - i])
        {
            palindrome = false;
        }
    }
    string temp = str3;
    for (int k = 0; k < 5; k++)
    {
        temp[k] = str1[k];
        str1[k] = str5[k];
        str5[k] = temp[k];
        temp[k] = str2[k];
        str2[k] = str4[k];
        str4[k] = temp[k];
    }

    for (int j = 0; j < 5; j++)
    {
        if (str1[4 - j] != str5[j])
        {
            palindrome = false;
        }
        if (str2[4 - j] != str4[j])
        {
            palindrome = false;
        }
    }
    if (palindrome)
    {
        cout<<endl;
        cout << "The Square is  a 2D Palindrom\n";
    }
    else
    {
        cout<<endl;
        cout << "Not a 2D Palindrom";
    }
    return 0;
}
```