C++ Programs Practice

1. Write a C++ Program to C++ Program to Add Two Numbers.

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

int main()
{
    int first, second, sum;

    cout << "Enter 1st integer : ";
    cin >> first;
    cout << "\nEnter 2nd integer : ";
    cin >> second;

    sum = first + second;

    cout<<"\nSum of Two Numbers "<<first<<" + "<<second<<" = "<<sum<<"\n";

    return 0;
}
```

2. Write a C++ Program to Find Size of Int Float Double and Char data types.

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

int main()
{
    cout << "Size of char: " << sizeof(char) << " byte" << endl;
    cout << "\nSize of int: " << sizeof(int) << " bytes" << endl;
    cout << "\nSize of float: " << sizeof(float) << " bytes" << endl;
    cout << "\nSize of double: " << sizeof(double) << " bytes" << endl;

    return 0;
}
```

3. Write a C++ Program to Find Sum and Average of three numbers.

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

int main()
{
    float a,b,c,sum,avg;
    cout<<"Enter 1st number : ";
    cin>>a;
    cout<<"\nEnter 2nd number : ";
    cin>>b;
    cout<<"\nEnter 3rd number : ";
    cin>>c;

    sum=a+b+c;

    avg=sum/3;

    cout<<"\nThe SUM of 3 Numbers "<<a<<" + "<<b<<" + "<<c<<"  = "<<sum<<"\n";
    cout<<"\nThe AVERAGE of 3 Numbers "<<a<<", "<<b<<", "<<c<<"  = "<<avg<<"\n";

    return 0;
}
```

4. Write a C++ Program to raise any number X to power N.

```cpp
#include<iostream>
#include<math.h>   //for pow() function
using namespace std;

int main()
{

    int x,n,result;

    cout<<"Enter value of X : ";
    cin>>x;
    cout<<"\nEnter value of N : ";
    cin>>n;

    result=pow(x,n);

    cout<<"\nThe Power of Number "<<x<<" ^ "<<n<<" = "<<result<<"\n";

    return 0;
}
```

5. Write a C++ Program to find Square Root of a number using sqrt() function.

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

using namespace std;

int main()
{
    float sq,n;

    cout<<"Enter any positive number : ";
    cin>>n;

    sq=sqrt(n);

    cout<<"\nSquare  root of Entered Number "<<n<<" is : "<<sq<<"\n";

    return 0;
}
```

6. Write a C++ Program to Check Character is Uppercase, Lowercase, Digit or Special Character.

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

int main()
{
    char ch;
    cout<<"Enter any character to check : ";
    cin>>ch;

    if(ch>=65&&ch<=90)
    {
        cout<<"\n The Entered Character  "<<ch<<"  is an UPPERCASE character.\n";
    }
    else if(ch>=48&&ch<=57)
    {
        cout<<"\n The Entered Character  "<<ch<<"  is a DIGIT.\n";
    }
    else if(ch>=97&&ch<=122)
    {
        cout<<"\n The Entered Character  "<<ch<<"  is a LOWERCASE character.\n";
    }
```

```
    else
    {
        cout<<"\n The Entered Character  "<<ch<<"  is an SPECIAL character.\n";
    }

    return 0;
}
```

7. Write a C++ Program to Check given number is Prime number or not.

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

int main()
{
  int i,n;

  cout<<"Enter any positive number : ";
  cin>>n;

  if(n==1)
  {
    cout<<"\nSmallest prime number is : 2";
  }

  for(i=2;i<n;i++)
  {
      if(n%i==0)
      {
          cout<<"\nThe Entered Number  "<<n<<"  is NOT a prime number.\n";
          break;
      }
  }

 if(n==i)
 {
    cout<<"\nThe Entered Number  "<<n<<"  is a prime number.\n";
 }

  return 0;
}
```

8. Write a C++ Program to Find the Number of Digits in a number.

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

int main()
{
    int n,no,a=0;

    cout<<"Enter any positive integer : ";
    cin>>n;

    no=n;

    while(no>0)
    {
        no=no/10;
        a++;
    }
    cout<<"\nNumber of Digits in a number  :"<<n<<"  is : "<<a<<"\n";

   return 0;
}
```

9. Write a C++ Program to Generate Fibonacci Series for N numbers.

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

int main()
{
    int i,no, first=0, second=1, next;

    first=0;
    second=1;

    cout<<"How many terms u want to Display : ";
    cin>>no;

    cout<<"\nThe Fibonacci series for  "<<no<<"  terms are : \n";
    for(i=0; i<no; i++)
    {
        cout<<" "<<first<<" ";
        next = first + second;
        first = second;
        second = next;
    }
    return 0;
}
```

10. Write a C++ Program to calculate Average of 5 subjects and find percentage.

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

int main()
{
        int mark[5], i;
        float sum=0;
        cout<<"\nEnter marks obtained in Physics, Chemistry, Maths, CS, English : \n";
        for(i=0; i<5; i++)
        {
            cout<<"\nEnter mark "<<i+1<<"  : ";
                cin>>mark[i];
                sum=sum+mark[i];
        }
        float avg=sum/5;
        float perc;
        perc=(sum/500)*100;
        cout<<"\nAverage Marks of 5 Subjects =  "<<avg<<"  \n";
        cout<<"\nPercentage in 5 Subjects =  "<<perc<<"%  \n";

        return 0;
}
```

11. Write a C++ Program to find Largest Element in an Array.

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

int main()
{
    int i,a[50],size;
    cout<<"Enter array size( Max:50 ) : ";
    cin>>size;
        cout<<"\nEnter array elements : \n";

        for(i=0; i<size; i++)
        {
            cout<<"\nEnter arr"<<i<<" Element : ";
                cin>>a[i];
        }

  cout<<"\nStored Data in Array : \n\n";

  for(i=0;i<size;i++)
  {
  cout<<" "<<a[i]<<" ";
  }

    int  largest=a[0];

        for (i=0;i<size;i++)
    {
                if(a[i]>largest)
                {
                        largest=a[i];
                }
        }
        cout<<"\n\nLargest Element in an Array : "<<largest<<endl;

        return 0;
}
```

12. Write a C++ Program to Reverse an Array using functions.

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

void Reverse_Array(int array[],int size);

int main()
{
    int i,a[50],size;
    cout<<"Enter array size( Max:50 ) : ";
    cin>>size;
        cout<<"\nEnter array elements : \n";

        for(i=0; i<size; i++)
        {
            cout<<"\nEnter arr["<<i<<"] Element :";
                cin>>a[i];
        }

  cout<<"\nStored Data in Array : \n\n";

  for(i=0;i<size;i++)
  {
  cout<<" "<<a[i]<<" ";
  }
        // Calling Reverse Array Values Function
        Reverse_Array(a,size);
        cout << "\n\nReversed Array Values are : " << endl;
    for(i=0;i<size;i++)
    {
      cout<<" "<<a[i]<<" ";
    }

    cout<<"\n";

        return 0;
}


void Reverse_Array(int array[],int size)
{
        int temp;
        size--;
        for (int i=0;size>=i;size--,i++)
    {
                temp=array[i];
                array[i]=array[size];
                array[size]=temp;
        }
}
```

13. Write a C++ Program to Find Duplicate Elements in an Array.

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

int main()
{
    int i,j,a[50],size;
    cout<<"Enter array size( Max:50 ) : ";
    cin>>size;
        cout<<"\nEnter array elements : \n";

        for(i=0; i<size; i++)
        {
            cout<<"\nEnter arr["<<i<<"] Element : ";
                cin>>a[i];
        }

  cout<<"\nStored Data in Array : \n\n";

  for(i=0;i<size;i++)
  {
      cout<<" "<<a[i]<<" ";
  }

  cout<<"\n\nDuplicate Values in Given Array are : \n\n";
  for(i=0; i<size; i++)
   {
    for(j=i+1;j<size;j++)
    {
    if(a[i]==a[j])
    {
      cout<<" "<<a[i]<<" ";
    }
   }
   }

  cout<<"\n";

  return 0;
 }
```

14. Write a C++ Program to Delete an element in an array at desired position.

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

int main()
{
   int i,a[50],no,pos,size;
    cout<<"Enter array size( Max:50 ) : ";
    cin>>size;
        cout<<"\nEnter array elements : \n";

        for(i=0; i<size; i++)
        {
            cout<<"\nEnter arr"<<i<<" Element : ";
                cin>>a[i];
        }

  cout<<"\nStored Data in Array : \n\n";

  for(i=0;i<size;i++)
  {
      cout<<" "<<a[i]<<" ";
  }

  cout<<"\n\nEnter position to Delete number : ";
  cin>>pos;

  if(pos>size)
  {
    cout<<"\nThis is out of range.\n";
  }
  else
   {
      --pos;
       for(i=pos;i<=size-1;i++)
      {
            a[i]=a[i+1];
      }
      cout<<"\nNew Array is : \n\n";

      for(i=0;i<size-1;i++)
      {
            cout<<" "<<a[i]<<" ";
      }

    }
  cout<<"\n";
  return 0;
}
```

15. Write a C++ Program to Insert an element in an array at specific position.

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

int main()
{
    int i,a[50],no,pos,size;
    cout<<"Enter array size( Max:50 ) : ";
    cin>>size;
        cout<<"\nEnter array elements : \n";

        for(i=0; i<size; i++)
        {
            cout<<"\nEnter arr["<<i<<"] Element : ";
                cin>>a[i];
        }

  cout<<"\nStored Data in Array : \n\n";

  for(i=0;i<size;i++)
  {
  cout<<" "<<a[i]<<" ";
  }

  cout<<"\n\nEnter position to insert number : ";
  cin>>pos;

  if(pos>size)
  {
    cout<<"\nThis is out of range.\n";
  }
  else
  {
    cout<<"\nEnter number to be inserted : ";
    cin>>no;
    --pos;

      for(i=size;i>=pos;i--)
      {
            a[i+1]=a[i];
      }
      a[pos]=no;

      cout<<"\nNew Array is : \n\n";

      for(i=0;i<size+1;i++)
      {
            cout<<" "<<a[i]<<" ";
      }
```

```
  }
  cout<<"\n";

  return 0;

}
```

16. Write a C++ Program to Sort Array Elements in Ascending order.

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

int main()
{
    int i,a[50],no,pos,size;
    cout<<"Enter array size( Max:50 ) : ";
    cin>>size;
        cout<<"\nEnter array elements : \n";

        for(i=0; i<size; i++)
        {
            cout<<"\nEnter arr["<<i<<"] Element : ";
                cin>>a[i];
        }

  cout<<"\nStored Data in Array : \n\n";

  for(i=0;i<size;i++)
  {
  cout<<" "<<a[i]<<" ";
  }

  cout<<"\n\nEnter position to insert number : ";
  cin>>pos;

  if(pos>size)
  {
    cout<<"\nThis is out of range.\n";
  }
  else
  {
        cout<<"\nEnter number to be inserted : ";
        cin>>no;
        --pos;
```

```
        for(i=size;i>=pos;i--)
        {
            a[i+1]=a[i];
        }

            a[pos]=no;

        cout<<"\nNew Array is : \n\n";

        for(i=0;i<size+1;i++)
        {
            cout<<" "<<a[i]<<" ";
        }

  }
        cout<<"\n";

  return 0;

  }
```

17. Write a C++ program to Find Sum of n Natural Numbers using Recursion.

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


int add(int n);

int main()
{
    int n;

    cout << "\nEnter any positive integer : ";
    cin >> n;

    cout << "\nThe Sum of natural numbers upto  "<<n<<"   =  " << add(n)<<"\n";

    return 0;
}

int add(int n)
{
    if(n != 0)
        return n + add(n - 1);
    return 0;
}
```

18. Write a C++ Program to find the area of rectangle using Structures.

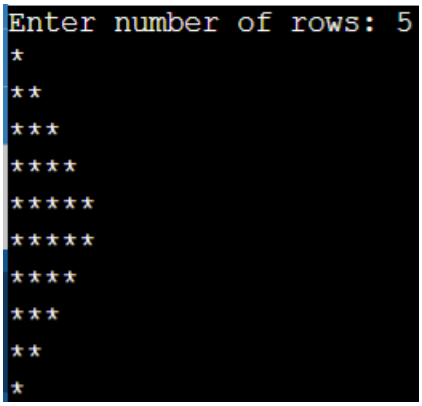
```cpp
#include <iostream>
using namespace std;
struct Rectangle{
    int width, height;
};

int main(){
    struct Rectangle rec;
    rec.width = 6;
    rec.height = 4;

    cout << "Area of Rectangle is: " << (rec.width * rec.height) << endl;

    return 0;
}
```

19. Write a C++ Program to Print Pattern

```
Enter number of rows:  5
*
* *
* * *
* * * *
* * * * *
```

```cpp
#include <iostream>
using namespace std;
int main()
{
int  i, j, n;
cout << "Enter number of rows:  ";
cin >> n;
for(i = 1; i <= n; i++)  // for rows
{
    for(j = 1; j <= i; j++)  // for columns
    {
        cout << "* ";
    }
    //Ending line after each row
    cout << "\n";
}
return 0;
}
```

20. Write a C++ program to print this pattern




```cpp
#include<iostream>
using namespace std;
int main()
{
int n, i , j;
cout << "Enter number of rows: ";
cin >> n;
// upper part
for(i = 1; i <= n; i++)
{
    for(j = 1; j <= i; j++)
    {
        cout << "*";
    }
// ending line after each row
cout<<"\n";
}
//lower part
for(i = n; i >= 1; i--)
{
    for(j = 1; j <= i; j++)
    {
        cout << "*" ;
    }
// ending line after each row
cout<<"\n";
}
return 0;
}
```