PROGRAMMING FUNDAMENTALS

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C++ PRACTICE EXERCISES

Program :Write a program in C++ to print the sum of two numbers.

```
#include<iostream>
using namespace std;
int main ()
{
   int a=29;
   int b=30;
   int sum;
   sum = a + b;
   cout<<"The sum of "<<a<<" and "<<b<<" is ="<<sum;
}
```

Sample Output:
Print the sum of two numbers :
The sum of 29 and 30 is : 59

Program 2 : Write a in C++ program to find the size of fundamental data types.

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

int main()
{
   cout << " Find Size of fundamental data types :"<<endl;;
 cout << " The sizeof(char) is :          " << sizeof(char) << " bytes \n" ;
cout << " The sizeof(short) is :          " << sizeof(short) << " bytes \n" ;
cout << " The sizeof(int) is :           " << sizeof(int) << " bytes \n" ;
cout << " The sizeof(long) is :          " << sizeof(long) << " bytes \n" ;
cout << " The sizeof(long long) is :       " << sizeof(long long) << " bytes \n";
 cout << " The sizeof(float) is :         " << sizeof(float) << " bytes \n" ;
cout << " The sizeof(double) is :         " << sizeof(double) << " bytes \n";
 cout << " The sizeof(long double) is : " << sizeof(long double) << " bytes \n";
 cout << " The sizeof(bool) is :          " << sizeof(bool) << " bytes \n\n";
return 0;
}
```

Sample Output:

```
Find Size of fundamental data types :
The sizeof(char) is : 1 bytes
The sizeof(short) is : 2 bytes
The sizeof(int) is : 4 bytes
The sizeof(long) is : 8 bytes
```

The sizeof(long long) is : 8 bytes
The sizeof(float) is : 4 bytes
The sizeof(double) is : 8 bytes
The sizeof(long double) is : 16 bytes
The sizeof(bool) is : 1 bytes

Program 3 :Write a in C++ program to check the upper and lower limits of integers.

```
#include <iostream>
#include <climits>
using namespace std;
int main()
{
   cout << " Check the upper and lower limits of integer : "<<endl;
   cout << " The maximum limit of int data type :                " << INT_MAX << endl;
   cout << " The minimum limit of int data type :                " << INT_MIN << endl;
   cout << " The maximum limit of unsigned int data type :       " << UINT_MAX << endl;
   cout << " The maximum limit of long long data type :          " << LLONG_MAX << endl;
   cout << " The minimum limit of long long data type :          " << LLONG_MIN << endl;
   cout << " The maximum limit of unsigned long long data type : " << ULLONG_MAX << endl;
   cout << " The Bits contain in char data type :                " << CHAR_BIT << endl;
   cout << " The maximum limit of char data type :               " << CHAR_MAX << endl;
   cout << " The minimum limit of char data type :               " << CHAR_MIN << endl;
   cout << " The maximum limit of signed char data type :        " << SCHAR_MAX << endl;
   cout << " The minimum limit of signed char data type :        " << SCHAR_MIN << endl;
   cout << " The maximum limit of unsigned char data type :      " << UCHAR_MAX << endl;
   cout << " The minimum limit of short data type :              " << SHRT_MIN << endl;
   cout << " The maximum limit of short data type :              " << SHRT_MAX << endl;
   cout << " The maximum limit of unsigned short data type :     " << USHRT_MAX << endl;
 cout << endl;
return 0;
}
```

Expected Output:

Check the upper and lower limits of integer
The maximum limit of int data type : 2147483647
The minimum limit of int data type : -2147483648
The maximum limit of unsigned int data type : 4294967295
The maximum limit of long long data type : 9223372036854775807
The minimum limit of long long data type : -9223372036854775808
The maximum limit of unsigned long long data type : 18446744073709551615
The Bits contain in char data type : 8
The maximum limit of char data type : 127
The minimum limit of char data type : -128
The maximum limit of signed char data type : 127
The minimum limit of signed char data type : -128

The maximum limit of unsigned char data type : 255
The minimum limit of short data type : -32768
The maximum limit of short data type : 32767
The maximum limit of unsigned short data type : 65535

Program 4 :Write a C++ program that calculates the volume of a sphere.

```
#include<iostream>
using namespace std;
int main()
{
   int radius;
   float vol;
   const float PI = 3.1415;
   vol= (4/3)*(PI*radius*radius*radius);
   cout<<"Calculate the volume of Sphere : "<<endl;
   cout<<"Enter the Radius of Sphere : ";
   cin>>radius;
   cout<<"Volume of Sphere = "<<vol;
}
```

Sample Output: Calculate the volume of a sphere : Enter the radius of a sphere : 6

Volume of a sphere is= 904.32

Program 5 : Write a C++ program to find the Area and Perimeter of a Rectangle.

```
#include<iostream> using namespace std; int main()
{
   int length,width,area,peri;
   cout<<"Find area and perimeter of rectangle : "<<endl;
   cout<<"Enter the length of rectangle : \n ";
   cin>>length;
   cout<<"Enter the width of rectangle : \n ";
   cin>>width;
   area = length * width;
   peri = 2 * (length+ width);
   cout<<"The area of rectangle = "<<area<<endl;
   cout<<"The perimeter of rectangle = "<<peri;
   return 0;
}
```

Sample Output:

Find area and perimeter of rectangle :

Enter the length of rectangle :

6

Enter the width of rectangle :

4

The area of rectangle = 24

The perimeter of rectangle = 20

Program 5 :Write a C++ program to compute the quotient and remainder.

```
#include<iostream>
using namespace std;
int main()
{
   int dividend,divisor,qoutient,remainder;
   cout<<"Compute qoutient and remainder : "<<endl;
   cout<<"Enter the dividend : ";
   cin>>dividend;
   cout<<"Enter the divisor : ";
   cin>>divisor;
   qoutient = dividend / divisor;
   remainder = dividend % divisor;
   cout<<"The qoutient of division = "<<qoutient<<endl;
   cout<<"The remainder of division = "<<remainder<<endl;
}
```

Sample Output :

Compute qoutient and remainder :

Enter the dividend : 6

Enter the divisor : 4

The qoutient of division = 1

The remainder of division = 2

Program 7 :Write a program in C++ to check whether a number is positive, negative or zero.

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

```
   cout<<"Enter a number : ";
   cin>>num;
   if (num > 0)
   {
   cout<<"Number is positive "<<num<<endl;
   }
 else if (num < 0)
   {
      cout<<"Numver is negative "<<num<<endl;
   }
   else
   {
      cout<<"Number is zero "<<num<<endl;
   }
}
```

Sample Output :

Enter a number : 6

Number is positive 6

Program 8 :Write a C++ program to print the code (ASCII code / Unicode code etc.) of a given character.

```
#include <iostream>
using namespace std;
int main()
{
   char sing_ch;
   cout << " Print code (ASCII code / Unicode code etc.) of a given character: "<<endl;

   cout << " Input a character: ";
   cin >> sing_ch;
 cout <<" The ASCII value of "<<sing_ch<<" is: " <<(int)sing_ch << endl;
  cout <<" The character for the ASCII value "<<(int)sing_ch <<" is: "<<(char)((int)sing_ch)
<< endl;
 return 0;
}
```

Sample Output

Print code (ASCII code / Unicode code etc.) of a given character:

Input a character: R

The ASCII value of R is: 82

The character for the ASCII value 82 is: R

Program 10 : Write a program that performs all mathematical operations on two variables

```
#include <iostream>
using namespace std;
int main ()
{
   int a=6;
   int b=4;
   cout<<"a + b = "<<a+b<<endl;
   cout<<"a - b = "<<a-b<<endl;
   cout<<"a * b = "<<a*b<<endl;
   cout<<"a / b = "<<a/b<<endl;
   cout<<"a % b = "<<a%b<<endl;
}
```

OUTPUT:

a + b = 10

a - b = 2

a * b = 24

a / b = 1

a % b = 2

Program 11 : Write a program that performs all compound assignment operations on an integer .

```
#include<iostream>
using namespace std;
int main ()
{
   int a;
   a=10;
   cout<<"Value of a : "<<a<<endl;
   a += 2;
   cout<<"Value of a after a+=2 : "<<a<<endl;
   a -= 4;
   cout<<"Value of a after a-=4 : "<<a<<endl;
   a *= 6;
   cout<<"Value of a after a*=6 : "<<a<<endl;
```

```
    a /= 8;
    cout<<"Value of a after a/=8 : "<<a<<endl;
}
```

OUTPUT

```
Value of a : 10
Value of a after a+=2 : 12
Value of a after a-=4 : 8
Value of a after a*=6 : 48
Value of a after a/=8 : 6
```

Program 12 : Write a program that solves the following expression

a* b / (-c * 31 % 13)* d ; a=10 , b=20 , c=15 , d=8

```
#include<iostream>
using namespace std;
int main()
{
    int a=10;
    int b=20;
    int c=15;
    int d=8;
    int r;
    r = a* b / ( -c * 31 % 13 )* d;
    cout<<"Result of expression = " <<r;
    return 0;
}
```

Output :

```
Result of expression = -160
```

Program 13 : Write a program that divides two float variables and finds the remainder using explicit type casting.

```
#include<iostream>
using namespace std;
int main()
{
    int a,b;
    int c;
    a=10;
    b=6;
    c = (int)a % (int)b;
    cout<<"Result = "<<c;
}
```

Output :

Result = 10

Program 14 : Write a program that inputs two numbers swaps the values and display them .

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

   int a,b,c;
   cout<<"Enter first number : ";
   cin>>a;
   cout<<"Enter second number : ";
   cin>>b;
   cout<<"You enter numbers as : "<<a<<" and "<<b<<endl;
   c=a;
   a=b;
   b=c;
   cout<<"The values after swapping are : "<<a<<" and "<<b;
   return 0;

}
```

Output :

```
Enter first number : 44
Enter second number : 66
You enter numbers as : 44 and 66
The values after swapping are : 66 and 4
```

Program 15 : Write a program that inputs a three digit number from the user and displays it in reverse order .

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

   int n;
   int a,b;
   cout<<"Enter a number : ";
   cin>>n;
   a = n / 100;
   n = n % 100;
```

```
   b = n / 10;
   n = n % 10;
 cout<<"The reverse of the number entered = "<<n<<a<<b;
}
```

Output :

Enter a number : 456

The reverse of the number entered = 645

Program 16 : Write a program that inputs a three digit number from the user and displays it in reverse order .

```
#include<iostream>
using namespace std;
int main()
{
   int n;
   int a,b,c,d;
   cout<<"Enter a number : ";
   cin>>n;
   a = n / 10000;
   n = n % 10000;
   b = n / 1000;
   n = n % 1000;
   c = n / 100;
   n = n % 100;
   d = n / 10;
   n = n % 10;
   cout<<"Entered number in reverse order = "<<n<<d<<c<<b<<a;
}
```

Output :

Enter a number : 06958

Entered number in reverse order = 85960

Program 17 : Write a program that will prompt the user to enter number of hours . It computes and displays the number of weeks , days and hours within the input number of hours.

```
#include<iostream>
using namespace std;
int main ()
{
   int hrs,w,d;
   cout<<"Enter the number of hours : ";
```

```
    cin>>hrs;
    w = hrs / 168;
    hrs = hrs % 168;
    d = hrs / 24;
    hrs = hrs % 24;
    cout<<"Weeks : "<<w<<endl;
    cout<<"Days : "<<d<<endl;
    cout<<"Hours : "<<hrs<<endl;
    return 0;
}
```

Output :

```
Enter the number of hours : 5700
Weeks : 33
Days : 6
Hours : 12
```