OBJECT ORIENTED PROGRAMMING WITH C++

ASSIGNMENT WORK-2 **DATE: 30th December 2023**

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1. Write a program to read in two integers and perform the following operations on them: addition, subtraction, multiplication, division, and modulo.

Program:

```
#include<iostream> using
namespace std;
int main(){
        int x,y;
        cout<<"Enter two numbers"<<endl;
        cin>>x;
cin>>y;        int
sum=x+y;     int
diff=x-y;       int
mul=x*y;      int
div=x%y;
        cout<<"The sum is "<<sum<<endl;
cout<<"The difference is "<<diff<<endl;
cout<<"The product is "<<mul<<endl;
        cout<<"The modulo is "<<div<<endl;
        return 0;
}
```

Output:

```
Enter two numbers
5
4
The sum is 9
The difference is 1
The product is 20
The modulo is 1

--------------------------------
Process exited after 3.515 seconds with return value 0
Press any key to continue . . .
```

2. Program to determine the integer is odd or even

Program:

```
#include<iostream> using
namespace std;
int main(){
        int n;
        cout<<"Enter the number
"<<endl;      cin>>n;       if(n%2==0){
                cout<<"It is an even number";

}
        else{
                cout<<"It is an odd number";
        }
}
```

Output:

```
Enter the number
8
It is an even number
--------------------------------
Process exited after 2.218 seconds with return value 0
Press any key to continue . . .
```

3. Program to compute the average of three integers

Program:

```
#include<iostream> using
namespace std;
int main(){
        int x,y,z;
        cout<<"Enter three
numbers"<<endl;   cin>>x;        cin>>y;
cin>>z;
```

```
        int avg=(x+y+z)/3;  cout<<"The
averaage is "<<avg;
        return 0;
}
```

Output:

```
Enter three numbers
45
48
50
The averaage is 47
--------------------------------
Process exited after 7.455 seconds with return value 0
Press any key to continue . . .
```

4. Program to check two numbers are equal or not Program:

```
#include<iostream> using
namespace std;
int main(){
            int x,y;
            cout<<"Enter the two numbers"<<endl;
        cin>>x;
cin>>y;       if(x==y){
                cout<<"They are equal";
            }
            else{
                cout<<"They are not equal";
            }
}
```

Output:

```
Enter the two numbers
5
9
They are not equal
--------------------------------
Process exited after 3.396 seconds with return value 0
Press any key to continue . . .
```

5. Write a program to read in two Floating numbers and perform the following operations on them: addition, subtraction, multiplication, division, and modulo.

Program:

```
#include<iostream>
using namespace std; int
main(){
        float x,y;
        cout<<"Enter two numbers"<<endl;
    cin>>x;
cin>>y;
    float sum=x+y;   float diff=x-y;   float
mul=x*y;   float div=x/y;   cout<<"The sum is
"<<sum<<endl;   cout<<"The difference is
"<<diff<<endl;   cout<<"The product is
"<<mul<<endl;
    cout<<"The modulo is "<<div<<endl;  return
0;
}
```

Output:

```
Enter two numbers
5.23
10.85
The sum is 16.08
The difference is -5.62
The product is 56.7455
The modulo is 0.482028

--------------------------------
Process exited after 6.478 seconds with return value 0
Press any key to continue . . .
```

6. Program to check the character is a vowel or consonant

Program:

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

```
        char x;
        cout<<"Enter the character"<<endl;
        cin>>x;
        char y=tolower(x);
    if(y=='a' || y=='e' || y=='i' || y=='o' || y=='u'){
cout<<"It is a vowel";
        }
        else{
            cout<<"It is a consonant";

        }


}
```

Output:

```
Enter the character
a
It is a vowel
--------------------------------
Process exited after 3.516 seconds with return value 0
Press any key to continue . . .
```

7. Program to check the number is positive, negative or zero

Program:

```
#include<iostream> using
namespace std;
int main(){
        int x;
        cout<<"Enter the number";
        cin>>x;
        if(x>0){
            cout<<"Positive number";
        }
        else if(x<0){
            cout<<"Negative number";
        }
        else{
            cout<<"Zero";
}
```

}

Output:

```
Enter the number-5
Negative number
--------------------------------
Process exited after 4.526 seconds with return value 0
Press any key to continue . . .
```

8. Program to determine which number is greater among two integers

Program:

```
#include<iostream> using
namespace std;
int main(){
        int x,y;
    cout<<"Enter the two numbers"<<endl;
cin>>x;  cin>>y;
        if(x>y){
            cout<<"First number is greater";
        }
        else{
            cout<<"Second number is greater";
        }
}
```

Output:

```
Enter the two numbers
8
5
First number is greater
--------------------------------
Process exited after 4.374 seconds with return value 0
Press any key to continue . . .
```

9. Program to read a floating-number and round it to the nearest integer using the floor an ceil functions.

Program:

```
#include<iostream>
#include<cmath> using
namespace std;
int main(){
        float x;
        cout<<"Enter the number"<<endl;
```

```
        cin>>x;
    cout<<"The nearest higher number is "<<ceil(x)<<endl;    cout<<"The
nearest lower number is "<<floor(x)<<endl;
}
```

Output:

```
Enter the number
5.3
The nearest higher number is 6
The nearest lower number is 5

--------------------------------
Process exited after 3.072 seconds with return value 0
Press any key to continue . . .
```

10. Program to swap two numbers using bitwise XOR operator

Program:

```
#include<iostream> using
namespace std; int main(){
        int x,y;
         cout<<"Enter the numbers "<<endl;
    cin>>x;  cin>>y;
    cout<<"Before swapping x = "<<x<<" y = "<<y<<endl;
x=x^y;   y=x^y;   x=x^y;
         cout<<"After swapping, x = "<<x<<" y = "<<y;

}
```

Output:

```
Enter the numbers
5
6
Before swapping x = 5 y = 6
After swapping, x = 6 y = 5
--------------------------------
Process exited after 8.663 seconds with return value 0
Press any key to continue . . .
```

11. Largest among three numbers using ternary conditional operator

Program:

```
#include<iostream> using
namespace std; int main(){
                int x,y,z,l;
                  cout<<"Enter the three numbers"<<endl;
          cin>>x;  cin>>y;
cin>>z;  l=x;
          if(y>l){
l=y;      }
          if(z>l){
l=z;      }
                  cout<<"The greatest of three numbers is "<<l;
}
```

Output:

```
Enter the three numbers
5
6
7
The greatest of three numbers is 7
--------------------------------
Process exited after 4.732 seconds with return value 0
Press any key to continue . . .
```

12. Program to check two numbers are equal or not using ternary conditional operator

Program:

```
#include<iostream>
#include<string> using
namespace std; int
main(){
          int x,y;   string
result;
                  cout<<"Enter the two numbers "<<endl;
          cin>>x;  cin>>y;
                   result=(x==y) ? "They are equal" : "They are not equal";
                 cout<<result;

}
```

Output:

```
Enter the two numbers
6
3
They are not equal
--------------------------------
Process exited after 3.357 seconds with return value 0
Press any key to continue . . .
```

13. Program to

check the integer is divisible by 3 or not using ternary conditional operator

Program:

```
#include<iostream>
#include<string> using
namespace std;
int main(){
        int x;
        string result;
        cout<<"Enter the number"<<endl;
        cin>>x;
    result=(x%3==0) ? "Divisible by three" : "Not divisible by three";    cout<<result;

}
```

Output:

```
Enter the number
9
Divisible by three
--------------------------------
Process exited after 2.084 seconds with return value 0
Press any key to continue . . .
```

14. Program to

print numbers from 1 to 10 using for loop

Program:

```
#include<iostream> using
namespace std;
int main(){
        cout<<"Printing numbers 1 to 10"<<endl;
for(int i=1;i<11;i++){
```

```
            cout<<i<<endl;
}
}
```

Output:

```
Printing numbers 1 to 10
1
2
3
4
5
6
7
8
9
10

--------------------------------
```

15. Factorial of a number using for loop

Program:

```
#include<iostream>
using namespace std; int
main(){
        int x,fact=1;          cout<<"Enter
the number"<<endl;
        cin>>x;
        for(int
i=1;i<x+1;i++){
fact=fact*i;  }
        cout<<"The factorial is "<<fact;
}
```

Output:

```
Enter the number
5
The factorial is 120
--------------------------------
Process exited after 2.349 seconds with return value 0
Press any key to continue . . .
```

16. Print
multiplication table using for loop

Program:

```
#include<iostream>
using namespace std;
int main(){
	int x,i;
	cout<<"Enter the numbber"<<endl;
	cin>>x;
	for(i=1;i<=10;i++){
		cout<<x<<" * "<<i<<" = "<<i*x<<endl;
	}
}
```

Output:

```
Enter the numbber
5
5 * 1 = 5
5 * 2 = 10
5 * 3 = 15
5 * 4 = 20
5 * 5 = 25
5 * 6 = 30
5 * 7 = 35
5 * 8 = 40
5 * 9 = 45
5 * 10 = 50
```

17. Fibonacci
series using for loop

Program:

```
#include<iostream>
using namespace std;
int main(){
	int a=0,b=1,sum;

	int n;
	cout<<"Enter the number of terms "<<endl;
	cin>>n;
	cout<<a<<" "<<b<<" ";
	for(int i=0;i<n-2;i++){
		sum=a+b;
		a=b;
```

```
            b=sum;
            cout<<sum<<" ";
        }
}
```

Output:

```
Enter the number of terms
8
0 1 1 2 3 5 8 13
--------------------------------
Process exited after 3.016 seconds with return value 0
Press any key to continue . . .
```

18. Prime number
using for loop

Program:

```
#include<iostream>
using namespace std;
int main(){
        int x;
        cout<<"Enter the number "<<endl;
        cin>>x;
        int flag=0;
        for(int i=2;i<x/2+1;i++){
                if(x%i==0){
                        flag=1;
                }
        }
        if(flag==0){
                cout<<"It is a prime number";

        }
        else{
                cout<<"Not a prime number";
        }
}
```

Output:

```
Enter the number
7
It is a prime number
--------------------------------
Process exited after 3.221 seconds with return value 0
Press any key to continue . . .
```

19. Check the
string is palindrome or not using while loop

Program:

```
#include<iostream>
```

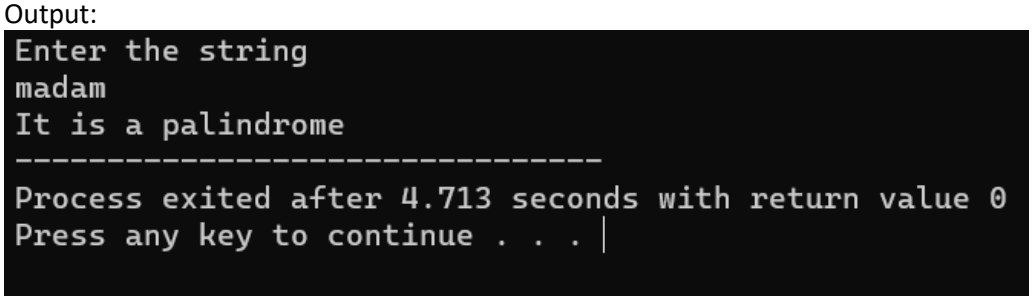
```
using namespace std;
int ispalin(string str){
	for(int i=0;i<str.length()/2;i++){
		if(str[i]!=str[str.length()-i-1]){
			return false;
		}

	}
	return true;

}
int main(){
	string str;
	cout<<"Enter the string"<<endl;
	cin>>str;
	if(ispalin(str)){
		cout<<"It is a palindrome";
	}
	else{
		cout<<"It is not a palindrome";
	}

}
```

Output:



20. Sum of all digits using while loop (n=123 output:1+2+3=6)

Program:

```
#include<iostream>
using namespace std;
int main(){
	int n,sum=0;
	cout<<"Enter the number"<<endl;
	cin>>n;
	while(n!=0){
		sum+=n%10;
		n=n/10;
	}
	cout<<"Sum of the digits is "<<sum;
}
```

Output:

```
Enter the number
123
Sum of the digits is 6
--------------------------------
Process exited after 6.196 seconds with return value 0
Press any key to continue . . .
```

21. GCD of two
numbers using do-while loop

Program:

```
#include<iostream>
using namespace std;
int main(){
	int a,b,res;
	cout<<"Enter the two numbers"<<endl;
	cin>>a;
	cin>>b;
	res=min(a,b);
	do{
		if(a%res==0 && b%res==0 ){
			cout<<"Greatest common divisor is "<<res;
			break;
		}
		res=res-1;
	}while(res>0);

}
```

Output:

```
Enter the two numbers
15
10
Greatest common divisor is 5
--------------------------------
Process exited after 3.832 seconds with return value 0
Press any key to continue . . .
```

22. Check whether
the number is perfect or not

Program:

```
#include<iostream>
using namespace std;
void isperfect(int n){
	int sum=0;
	for(int i=0;i<(n/2)+1;i++){
		if(n%i==0){
			sum+=i;
		}
```

```
	}
	if(sum==n){
		cout<<"It is a perfect number";

	}
	else{
		cout<<"It is not a perfect number";
	}
}
int main(){
	int n;
	cout<<"Enter the number"<<endl;
	cin>>n;
	isperfect(n);
	return 0;
}
```
Output:

23. Armstrong number

Program:

```
#include<iostream>
#include<bits/stdc++.h>
using namespace std;
bool isperfect(int n){
	int x=n;
	int p=0;


	while(n!=0){
		int a =(n%10);
		p+=pow(a,3);
		n=n/10;
	}
	if(p==x){
		return true;
	}
	else{
		return false;
```

```
        }
}

int main(){
        int n;
        cout<<"Enter the number"<<endl;
        cin>>n;
        if(isperfect(n)){
                cout<<"It is an armstrong number";
        }
        else{
                cout<<"It is not an armstrong number";
        }
}
```

Output:

```
Enter the number
123
It is not an armstrong number
--------------------------------
Process exited after 3.069 seconds with return value 0
Press any key to continue . . .
```

24. Harshad number

Program:

```
#include<iostream>
using namespace std;
int main(){
        int n,sum=0;
        cout<<"Enter the number"<<endl;
        cin>>n;
        int x=n;
        while(n!=0){
                sum+=n%10;
                n=n/10;
        }
        if(sum==x){
                cout<<"It is a harshad number";
        }
        else{
                cout<<"It is not a harshad number";
        }
}
```

Output:

25. Happy number

Program:

```
#include<bits/stdc++.h>
using namespace std;
int main()
{
   int num,temp,sum=0;
   cout<<"Enter the number"<<endl;
   cin>>num;
   while(sum!=1 && sum!=4)
   {
      sum=0;
      while(num>0)
      {
         temp=num%10;
         sum=sum+(temp*temp);
         num=num/10;
      }
      num=sum;
   }
   if(sum==1)
   cout<<"Happy Number"<<endl;
   else
   cout<<"Unhappy Number"<<endl;
   return 0;
}
```

Output:

```
Enter the number
23
Happy Number

--------------------------------
Process exited after 18.46 seconds with return value 0
Press any key to continue . . .
```

26.Strong number

Program:

```
#include<iostream>
using namespace std;
int fact(int x){
          int f=1;
          for(int i=1;i<=x;i++){
                    f=f*i;
          }
          return f;
}
```

```
int strong(int n){
	int x=n;
	int sum=0;
	while(n!=0){
		sum+=fact(n%10);
		n=n/10;
	}
	return sum;
}

int main(){
	int n;
	cout<<"Enter the number"<<endl;
	cin>>n;
	if(strong(n)==n){
		cout<<"It is a strong number";
	}
	else{
		cout<<"It is not a strong number";
	}
}
```

Output:

```
Enter the number
145
It is a strong number
--------------------------------
Process exited after 3.177 seconds with return value 0
Press any key to continue . . .
```

27.Buzz number

Program:

```
#include<iostream>
using namespace std;
int main(){
	int n;
	cout<<"Enter the number"<<endl;
	cin>>n;
	if((n%10)==7 || n/7==0 ){
		cout<<"It is a buzz number";
	}
	else{
		cout<<"It is not a buzz number";
	}
}
```

Output:

```
Enter the number
27
It is a buzz number
--------------------------------
Process exited after 4.04 seconds with return value 0
Press any key to continue . . .
```

28.neon number

Program:

```
#include<iostream>
using namespace std;
int main(){
	int n,sum=0,sq;
	cout<<"Enter the number"<<endl;
	cin>>n;
	sq=n*n;
	int x=n;
	while(sq!=0){
		sum+=sq%10;
		sq=sq/10;
	}
	if(sum==n){
		cout<<"It is a neon number";
	}
	else{
		cout<<"It is not a neon number";
	}

}
```

Output:

```
Enter the number
9
It is a neon number
--------------------------------
Process exited after 1.833 seconds with return value 0
Press any key to continue . . .
```

29.Abundant Number

Program:

```
#include<iostream>
using namespace std;
int main(){
	int n,sum=0;
	cout<<"Enter the number"<<endl;
	cin>>n;
	for(int i=1;i<n/2+1;i++){
		if(n%i==0){
```

```
                sum+=i;
            }
        }
        if(sum>n){
            cout<<"It is an abundant number";
        }
        else{
            cout<<"It is not an abundant number";
        }

}
```

Output:

```
Enter the number
12
It is an abundant number
--------------------------------
Process exited after 1.292 seconds with return value 0
Press any key to continue . . .
```

30.

Program:

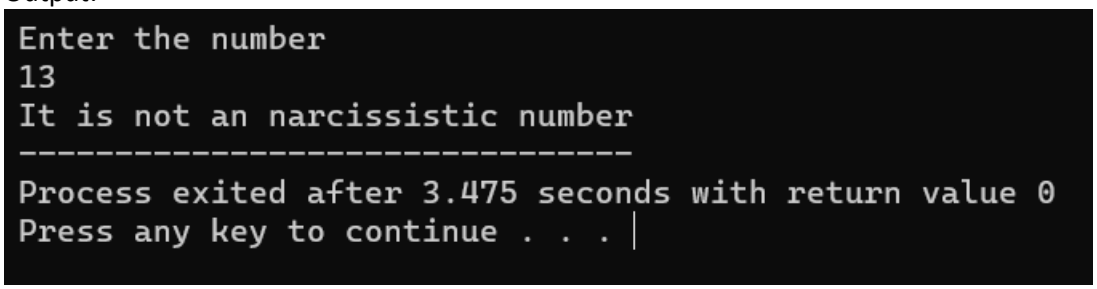
```
#include<iostream>
#include<bits/stdc++.h>
using namespace std;
bool isperfect(int n){
        int x=n;
        int p=0;


        while(n!=0){
            int a =(n%10);
            p+=pow(a,3);
            n=n/10;
        }
        if(p==x){
            return true;
        }
        else{
            return false;
        }
}

int main(){
        int n;
        cout<<"Enter the number"<<endl;
        cin>>n;
        if(isperfect(n)){
            cout<<"It is an narcissistic number";
        }
        else{
```

```
                cout<<"It is not an narcissistic number";
        }
}
```

Output:



31.