

Assignment-2

(Loops)

Q1. Predict the output

```
#include <bits/stdc++.h>
using namespace std;
int main() {
    while ('1' < '2')
        cout << "In while loop" << endl;
}
```

Answer:

In while loop

In while loop

In while loop

.
. .
.

∞

Q2. Predict the output

```
#include <bits/stdc++.h>
using namespace std;
int main( ) {
    int t = 10;
    while (t != 2) {
        cout << "Hello" << endl;
    }
}
```

Answer:

Hello

Hello

Hello

.
. .
.

∞

Q3. Predict the output

```
#include <bits/stdc++.h>
using namespace std;
int main( ) {
    for (int x = 1; x * x ≤ 10; x++)
        cout << "In for loop" << endl;
}
```

Answer:

In for loop

In for loop

In for loop

Q4. Predict the output

```
#include <bits/stdc++.h>
using namespace std;
int main( ) {
    int x = 10, y = 0 ;
    while ( x ≥ y ) {
        x-- ;
        y++ ;
        cout << x << " " << y << endl ;
    }
}
```

Answer:

9 1

8 2

7 3

6 4

5 5

4 6

Q5. WAP to print the sum of all the even digits of a given number.

Sample Input : 4556

Output: 10

The screenshot shows a Visual Studio Code editor with a C++ file named `Answer5.cpp`. The code implements a program that takes an integer input and checks if it is even. If it is even, it calculates the sum of its even digits. The logic uses a `while` loop to extract digits and a `if` statement to check for evenness. The output shows the sum of even digits for the input 2456789 is 38.

```
1 #include<iostream>
2 using namespace std;
3 int main()
4 {
5     int num, even_sum=0;
6     cout<<"Enter a number: ";
7     cin>>num;
8     int num1 = num;
9     bool flag = true;
10    while(num!=0){
11        int ld = num%10;
12        if(ld%2==0){
13            flag = false;
14            even_sum+=ld;
15        }
16        num/=10;
17    }
18    if(flag==true) cout<<"No even digits present in "<<num1;
19    else cout<<"Sum of even digits = "<<even_sum;
20 }
```

The terminal output shows the execution of the program:

```
PS C:\Users\Manish\Desktop\Coding> cd "C:\Users\Manish\Desktop\Coding\C++\Assignments\Assignment-4_Loops" ; if ($?) { g++ Answer5.cpp -o Answer5 } ; if ($?) { .\Answer5 }
Enter a number: 2456789
Sum of even digits = 38
PS C:\Users\Manish\Desktop\Coding\C++\Assignments\Assignment-4_Loops>
```

Q6. WAP to print the sum of a given number and its reverse.

Sample Input : 12

Sample Output : 33 [12+21]

Answer:

The screenshot shows a Visual Studio Code editor with a C++ file named `Answer6.cpp`. The code implements a program that takes an integer input and calculates the sum of the number and its reverse. The logic uses a `while` loop to extract digits and calculate the reverse number. The output shows the sum of 12 and its reverse 21 is 33.

```
1 #include<iostream>
2 using namespace std;
3 int main()
4 {
5     int num, rev=0;
6     cout<<"Enter a number: ";
7     cin>>num;
8     int num1=num;
9     while(num!=0){
10        int ld = num%10;
11        rev = rev*10+ld;
12        num/=10;
13    }
14    cout<<num1<<" + "<<rev<<" = "<<num1+rev;
15 }
```

The terminal output shows the execution of the program:

```
PS C:\Users\Manish\Desktop\Coding> cd "C:\Users\Manish\Desktop\Coding\C++\Assignments\Assignment-4_Loops" ; if ($?) { g++ Answer6.cpp -o Answer6 } ; if ($?) { .\Answer6 }
Enter a number: 12
12 + 21 = 33
PS C:\Users\Manish\Desktop\Coding\C++\Assignments\Assignment-4_Loops>
```

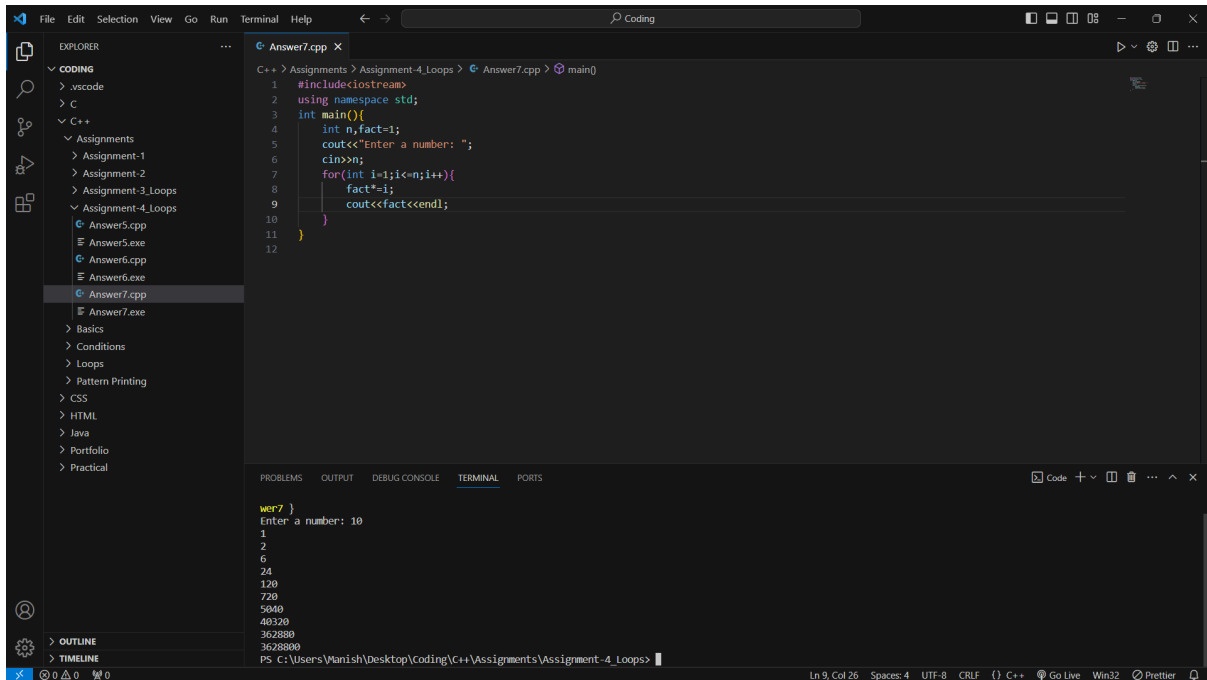
Q7. Print the factorials of first 'n' numbers

Sample Input : 10

Output :

**1
2
6
24
120
720
5040
40320
362880
3628800**

Answer:



The screenshot shows a Visual Studio Code editor with a C++ file named `Answer7.cpp`. The code is as follows:

```
1 #include<iostream>
2 using namespace std;
3 int main(){
4     int n,fact=1;
5     cout<<"Enter a number: ";
6     cin>>n;
7     for(int i=1;i<=n;i++){
8         fact*=i;
9         cout<<fact<<endl;
10    }
11 }
12
```

The terminal at the bottom shows the program's execution:

```
wor7 )
Enter a number: 10
1
2
6
24
120
720
5040
40320
362880
3628800
PS C:\Users\Vanish\Desktop\coding\C++\Assignments\Assignment-4_Loops>
```

Q8. Print first 'n' fibonacci numbers.

Sample Input : 10

Output : 1 1 2 3 5 8 13 21 34 55

Answer:

The screenshot shows a VS Code editor with a C++ file named `Answer8.cpp` open. The code implements a Fibonacci sequence generator. It includes `<iostream>` and uses the `std` namespace. The `main` function prompts the user to enter a number `n`, then uses a `for` loop to calculate and print the first `n` Fibonacci numbers. The output in the terminal shows the sequence: 1 1 2 3 5 8 13 21 34 55.

```
1 #include<iostream>
2 using namespace std;
3 int main(){
4     int n;
5     cout<<"Enter a number: ";
6     cin>>n;
7     int a=1,b=1, fibo;
8     cout<<a<<" "<<b<<" ";
9     for(int i=1;i<=n-2;i++){
10         fibo=a+b;
11         a=b;
12         b=fibo;
13         cout<<b<<" ";
14     }
15 }
```

The terminal output is as follows:

```
PS C:\Users\Manish\Desktop\Coding> cd "C:\Users\Manish\Desktop\Coding\C++\Assignments\Assignment-4_Loops\" ; if ($?) { g++ Answer8.cpp -o Answer8 } ; if ($?) { .\Answer8 }
Enter a number: 10
1 1 2 3 5 8 13 21 34 55
PS C:\Users\Manish\Desktop\Coding\C++\Assignments\Assignment-4_Loops>
```

Q9. Write a program to print out all Armstrong numbers between 1 and 500. If the sum of cubes of each digit of the number is equal to the number itself, then the number is called an Armstrong number. For example, $153 = (1 * 1 * 1) + (5 * 5 * 5) + (3 * 3 * 3)$

Output :

1
153
370
371
407

Answer:

The screenshot shows a VS Code editor with a C++ file named `Answer9.cpp` open. The code implements a program to find Armstrong numbers between 1 and 500. It includes `<iostream>` and uses the `std` namespace. The `main` function uses a `for` loop to iterate through numbers from 1 to 500. For each number, it calculates the sum of the cubes of its digits. If the sum equals the original number, it prints the number. The output in the terminal shows the Armstrong numbers: 1, 153, 370, 371, and 407.

```
1 #include<iostream>
2 using namespace std;
3 int main(){
4     for(int i=1;i<=500;i++){
5         int sum = 0;
6         for(int j=i;j!=0;j/=10){
7             int ld = j%10;
8             sum = sum+(ld*ld*ld);
9         }
10        if(sum==i) cout<<i<<endl;
11    }
12 }
```

The terminal output is as follows:

```
PS C:\Users\Manish\Desktop\Coding> cd "C:\Users\Manish\Desktop\Coding\C++\Assignments\Assignment-4_Loops\" ; if ($?) { g++ Answer9.cpp -o Answer9 } ; if ($?) { .\Answer9 }
1
153
370
371
407
PS C:\Users\Manish\Desktop\Coding\C++\Assignments\Assignment-4_Loops>
```