OOP: Assignment No. 1

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1) Check Number is Even or Odd

Input:

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

int main() {
   int num;
   cout << "Enter a number: ";
   cin >> num;

   if (num % 2 == 0)
      cout << num << " is Even";
   else
      cout << num << " is Odd";

   return 0;
}
```

Output:

```
PS D:\DS\CPP_Assignment> g++ evenodd.cpp -o evenodd.exe
PS D:\DS\CPP_Assignment> ./evenodd.exe
Enter a number: 4
4 is Even
```

```
PS D:\DS\CPP_Assignment> ./evenodd.exe
Enter a number: 5
5 is Odd
```

2) Find Largest Number Among 3 Numbers.

Input:

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

int main() {
   int a, b, c;
   cout << "Enter three numbers: ";
   cin >> a >> b >> c;

   if (a >= b && a >= c)
      cout << "Largest: " << a;
   else if (b >= a && b >= c)
      cout << "Largest: " << b;
   else
      cout << "Largest: " << c;

   return 0;
}
```

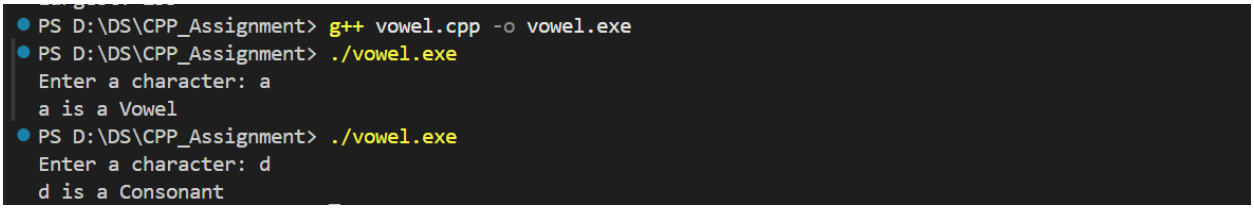
Output:

3) Check Whether a Character is a Vowel or Consonant

Input:

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

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

   if (ch=='a'||ch=='e'||ch=='i'||ch=='o'||ch=='u'||
      ch=='A'||ch=='E'||ch=='I'||ch=='O'||ch=='U')
      cout << ch << " is a Vowel";
   else
      cout << ch << " is a Consonant";

   return 0;
}
```

Output:

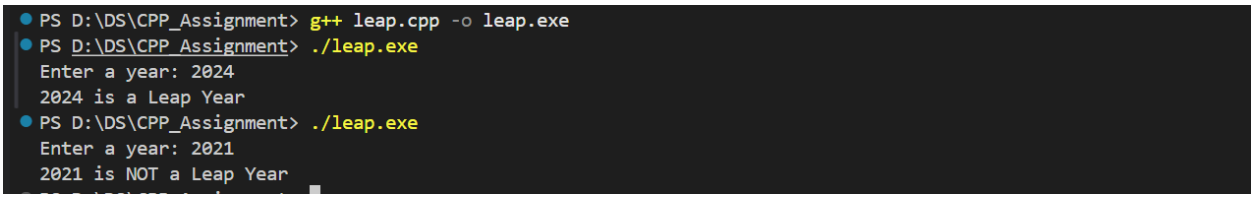


4)Check if a Given Year is a Leap Year

Input:

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

int main() {
   int year;
   cout << "Enter a year: ";
   cin >> year;

   if ((year % 4 == 0 && year % 100 != 0) || (year % 400 == 0))
      cout << year << " is a Leap Year";
   else
      cout << year << " is NOT a Leap Year";

   return 0;
}
```

Output:



5)Print Multiplication Table of a Number

Input:

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

int main() {
   int num;
   cout << "Enter a number: ";
   cin >> num;

   for (int i = 1; i <= 10; i++) {
      cout << num << " x " << i << " = " << num * i << endl;
   }

   return 0;
}
```

Output:

```
PS D:\DS\CPP_Assignment> g++ multtable.cpp -o multtable.exe
PS D:\DS\CPP_Assignment> ./multtable.exe
Enter a number: 3
3 x 1 = 3
3 x 2 = 6
3 x 3 = 9
3 x 4 = 12
3 x 5 = 15
3 x 6 = 18
3 x 7 = 21
3 x 8 = 24
3 x 9 = 27
3 x 10 = 30
```

6)Calculate Sum of First n Natural Numbers

Input:

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

int main() {
   int n, sum = 0;
   cout << "Enter n: ";
   cin >> n;

   for (int i = 1; i <= n; i++) {
      sum += i;
   }

   cout << "Sum = " << sum;
   return 0;
}
```

Output:

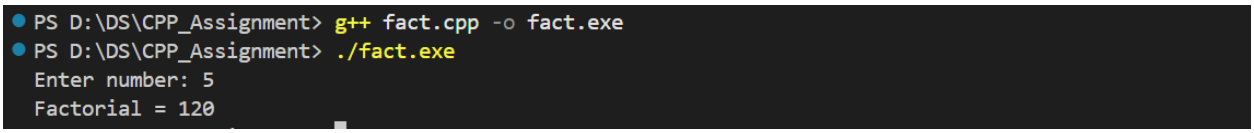
```
PS D:\DS\CPP_Assignment> g++ sumn.cpp -o sumn.exe
PS D:\DS\CPP_Assignment> ./sumn.exe
Enter n: 23
Sum = 276
```

7)Find Factorial of a Number

Input:

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

int main() {
    int n, fact = 1;
    cout << "Enter number: ";
    cin >> n;

    for (int i = 1; i <= n; i++) {
        fact *= i;
    }

    cout << "Factorial = " << fact;
    return 0;
}
```

Output:

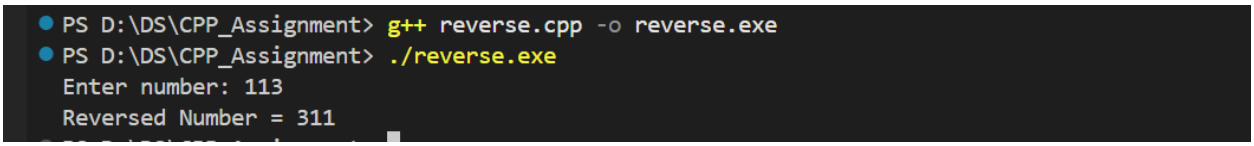


8) Reverse a Number.

Input:

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

int main() {
   int n, rev = 0;
   cout << "Enter number: ";
   cin >> n;

   while (n > 0) {
      rev = rev * 10 + (n % 10);
      n /= 10;
   }

   cout << "Reversed Number = " << rev;
   return 0;
}
```

Output:

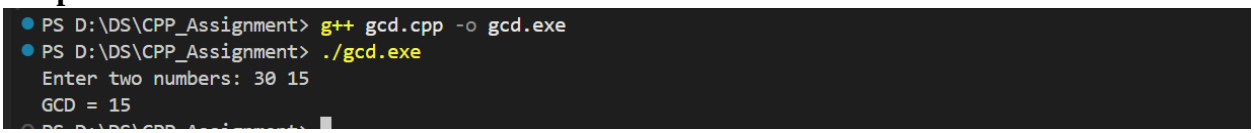


9)Find GCD

Input:

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

int main() {
    int a, b;
    cout << "Enter two numbers: ";
    cin >> a >> b;

    while (b != 0) {
        int temp = b;
        b = a % b;
        a = temp;
    }

    cout << "GCD = " << a;
    return 0;
}
```

Output:



10)Find LCM

Input:

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

int main() {
   int a, b, lcm, gcd, x, y;
   cout << "Enter two numbers: ";
   cin >> a >> b;

   x = a; y = b;

   while (b != 0) {
      int temp = b;
      b = a % b;
      a = temp;
   }
   gcd = a;
   lcm = (x * y) / gcd;

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

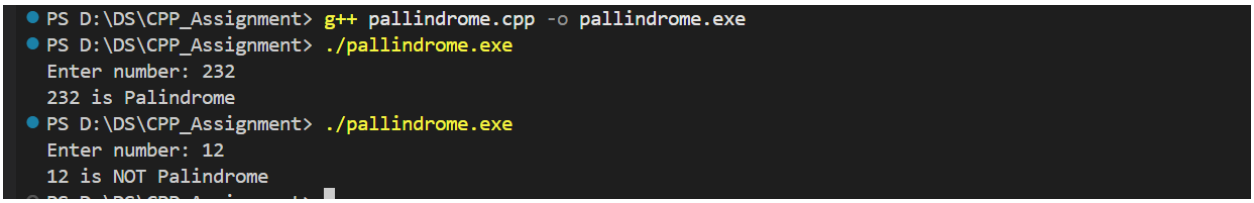
Output:

11)Check Whether a Number is a Palindrome or Not

Input:

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

int main() {
   int n, rev = 0, temp;
   cout << "Enter number: ";
   cin >> n;
   temp = n;

   while (temp > 0) {
      rev = rev * 10 + (temp % 10);
      temp /= 10;
   }

   if (rev == n)
      cout << n << " is Palindrome";
   else
      cout << n << " is NOT Palindrome";

   return 0;
}
```

Output:



12)Check Whether a Number is Prime or Not

Input:

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

int main() {
   int n, flag = 1;
   cout << "Enter number: ";
   cin >> n;

   if (n <= 1) flag = 0;
   for (int i = 2; i <= n / 2; i++) {
      if (n % i == 0) {
         flag = 0;
         break;
      }
   }

   if (flag) cout << n << " is Prime";
   else cout << n << " is NOT Prime";

   return 0;
}
```

Output:

13)Display Prime Numbers Between Two Intervals

Input:

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

int main() {
   int low, high;
   cout << "Enter range: ";
   cin >> low >> high;

   for (int n = low; n <= high; n++) {
      int flag = 1;
      if (n <= 1) flag = 0;
      for (int i = 2; i <= n / 2; i++) {
         if (n % i == 0) {
            flag = 0;
            break;
         }
      }
      if (flag) cout << n << " ";
   }


   return 0;

}
```

Output:

```
PS D:\DS\CPP_Assignment> g++ primerange.cpp -o primerange.exe
PS D:\DS\CPP_Assignment> ./primerange.exe
Enter range: 20 50
23 29 31 37 41 43 47
```

14)Check Neon Numbers in a Given Range

Input:

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

int main() {
   int start, end;
   cout << "Enter range: ";
   cin >> start >> end;

   for (int n = start; n <= end; n++) {
      int sq = n * n, sum = 0, temp = sq;
      while (temp > 0) {
         sum += temp % 10;
         temp /= 10;
      }
      if (sum == n)
         cout << n << " ";
   }

   return 0;
}
```

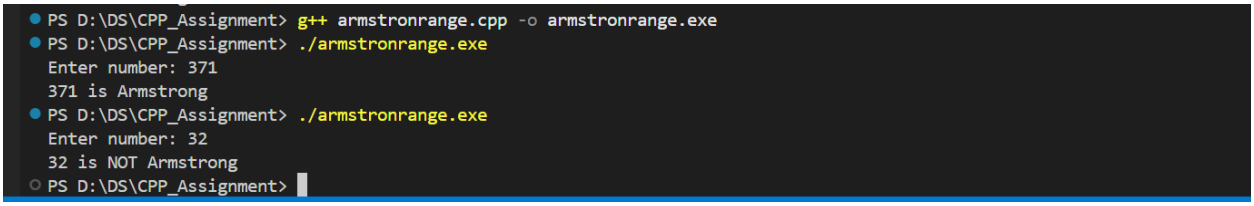
Output:

15)Check Armstrong Number

Input:

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

int main() {
   int n, sum = 0, temp, digits = 0;
   cout << "Enter number: ";
   cin >> n;

   temp = n;
   while (temp > 0) {
      int d = temp % 10;
      sum += d*d*d;
      temp /= 10;
   }

   if (sum == n) cout << n << " is Armstrong";
   else cout << n << " is NOT Armstrong";

   return 0;
}
```

Output:

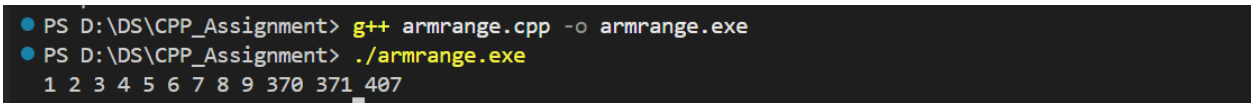


16)Display Armstrong Numbers Between 1 to 1000

Input:

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

int main() {
   for (int n = 1; n <= 1000; n++) {
      int sum = 0, temp = n, digits = 0;
      temp = n;
      while (temp > 0) {
         int d = temp % 10;
         sum += d*d*d;
         temp /= 10;
      }
      if (sum == n) cout << n << " ";
   }

   return 0;
}
```

Output:

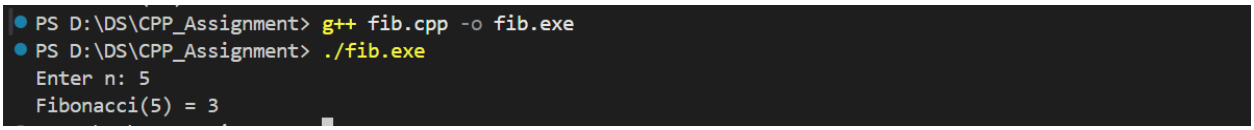


17)Find nth Fibonacci Number

Input:

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

int main() {
   int n;
   cout << "Enter n: ";
   cin >> n;

   int a = 0, b = 1, fib;
   if (n == 1) fib = 0;
   else if (n == 2) fib = 1;
   else {
      for (int i = 3; i <= n; i++) {
         fib = a + b;
         a = b;
         b = fib;
      }
   }

   cout << "Fibonacci(" << n << ") = " << fib;
   return 0;
}
```

Output:

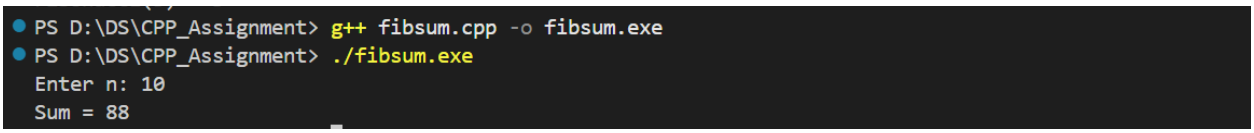


18)Sum of Fibonacci Numbers at Even Indexes up to N Terms

Input:

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

int main() {
    int n;
    cout << "Enter n: ";
    cin >> n;

    int a = 0, b = 1, sum = 0;
    for (int i = 1; i <= n; i++) {
        if (i % 2 == 0) sum += b;
        int temp = b;
        b = a + b;
        a = temp;
    }

    cout << "Sum = " << sum;
    return 0;
}
```

Output:



19)Calculate the Power of a Number

Input:

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

int main() {
    int base, exp, result = 1;
    cout << "Enter base and exponent: ";
    cin >> base >> exp;

    for (int i = 1; i <= exp; i++) {
        result *= base;
    }

    cout << "Result = " << result;
    return 0;
}
```

Output:

```
PS D:\DS\CPP_Assignment> g++ power.cpp -o power.exe
PS D:\DS\CPP_Assignment> ./power.exe
Enter base and exponent: 2 3
Result = 8
```

20)Display Factors of a Natural Number

Input:

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

int main() {
    int n;
    cout << "Enter number: ";
    cin >> n;

    cout << "Factors: ";
    for (int i = 1; i <= n; i++) {
        if (n % i == 0)
            cout << i << " ";
    }

    return 0;
}
```

Output:

```
PS D:\DS\CPP_Assignment> g++ factors.cpp -o factors.exe
PS D:\DS\CPP_Assignment> ./factors.exe
Enter number: 45
Factors: 1 3 5 9 15 45
```

21)Make a Simple Calculator

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

int main() {
   char op;
   double a, b;
   cout << "Enter expression (a + b): ";
   cin >> a >> op >> b;

   switch (op) {
      case '+': cout << "Result = " << a + b; break;
      case '-': cout << "Result = " << a - b; break;
      case '*': cout << "Result = " << a * b; break;
      case '/':
         if (b != 0) cout << "Result = " << a / b;
         else cout << "Division by zero not allowed";
         break;
      default: cout << "Invalid operator";
   }

   return 0;
}
```

Output: