Day-1 Homework

Complexity Table

Q.No	Question	Time Complexity	Space Complexity
1	Even or odd (for loop)	O(n)	O(1)
2	Vowel or Consonant	O(1)	O(1)
3	Leap Year	O(1)	O(1)
4	HCF (Euclidean Algorithm)	O(log(min(a,b)))	O(1)
5	LCM (via HCF)	O(log(min(a,b)))	O(1)

Questions

1. **Even or Odd** – (Subtract 2 Again & Again using for loop)
2. **Vowel or Consonant** – Check whether a given alphabet is vowel or consonant.
3. **Leap Year** – Check whether a year is a leap year or not.
4. **HCF** – Find the Highest Common Factor of two numbers.
5. **LCM** – Find the Least Common Multiple of two numbers.

Solutions

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1. Even or Odd (Subtract 2 Again & Again using for loop)

C++

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

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

    if (n < 0) n = -n; // handle negative numbers

    for (; n > 1; n -= 2) {
        // subtract 2 each loop
    }

    if (n == 0)
        cout << "Even" << endl;
    else
        cout << "Odd" << endl;
```

SYNTAX ERROR

```
    return 0;
}
```

Java

```
import java.util.Scanner;

public class EvenOddSubtract2ForLoop {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter a number: ");
        int n = sc.nextInt();

        if (n < 0) n = -n; // handle negative numbers

        for (; n > 1; n -= 2) {
            // subtract 2 each loop
        }

        if (n == 0)
            System.out.println("Even");
        else
            System.out.println("Odd");

        sc.close();
    }
}
```

Python

```
n = int(input("Enter a number: "))

n = abs(n)  # handle negative numbers

for _ in range(n // 2):
    n -= 2

if n == 0:
    print("Even")
else:
    print("Odd")
```

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2. Vowel or Consonant

C++

```
#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 << "Vowel" << endl;
```

SYNTAX ERROR

```
    else
        cout << "Consonant" << endl;

    return 0;
}
```

Java

```
import java.util.Scanner;

public class VowelCheck {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter a character: ");
        char ch = sc.next().charAt(0);

        if (ch == 'a' || ch == 'e' || ch == 'i' || ch == 'o' || ch == 'u'
||
            ch == 'A' || ch == 'E' || ch == 'I' || ch == 'O' || ch == 'U')
            System.out.println("Vowel");
        else
            System.out.println("Consonant");

        sc.close();
    }
}
```

Python

```
ch = input("Enter a character: ")

if ch in 'aeiouAEIOU':
    print("Vowel")
else:
    print("Consonant")
```

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3. Leap Year

C++

```
#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 << "Leap Year" << endl;
    else
        cout << "Not a Leap Year" << endl;

    return 0;
}
```

Java

SYNTAX ERROR

```java
import java.util.Scanner;

public class LeapYearCheck {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter a year: ");
        int year = sc.nextInt();

        if ((year % 4 == 0 && year % 100 != 0) || (year % 400 == 0))
            System.out.println("Leap Year");
        else
            System.out.println("Not a Leap Year");

        sc.close();
    }
}
```

Python

```python
year = int(input("Enter a year: "))

if (year % 4 == 0 and year % 100 != 0) or (year % 400 == 0):
    print("Leap Year")
else:
    print("Not a Leap Year")
```

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4. HCF

C++

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

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

    int x = a, y = b;

    while (y != 0) {
        int temp = y;
        y = x % y;
        x = temp;
    }

    cout << "HCF: " << x << endl;

    return 0;
}
```

Java

```java
import java.util.Scanner;

public class HCF_Calculation {
    public static void main(String[] args) {
```

SYNTAX ERROR

```
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter two numbers: ");
        int a = sc.nextInt();
        int b = sc.nextInt();

        int x = a, y = b;

        while (y != 0) {
            int temp = y;
            y = x % y;
            x = temp;
        }

        System.out.println("HCF: " + x);

        sc.close();
    }
}
```

Python

```
a = int(input("Enter first number: "))
b = int(input("Enter second number: "))

x, y = a, b
while y != 0:
    temp = y
    y = x % y
    x = temp

print("HCF:", x)
```

---

5. LCM

C++

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

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

    int x = a, y = b;

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

    cout << "LCM: " << lcm << endl;

    return 0;
}
```

SYNTAX ERROR

Java

```
import java.util.Scanner;

public class LCM_Calculation {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter two numbers: ");
        int a = sc.nextInt();
        int b = sc.nextInt();

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

        System.out.println("LCM: " + lcm);

        sc.close();
    }
}
```

Python

```
a = int(input("Enter first number: "))
b = int(input("Enter second number: "))

x, y = a, b
while y != 0:
    temp = y
    y = x % y
    x = temp

hcf = x
lcm = (a * b) // hcf

print("LCM:", lcm)
```

SYNTAX ERROR