Experiment-1.2

Student Name: Vishal Saini
UID: 23BCS10163
Branch: B.E-C.S.E
Section/Group: 23KRG-2A
Semester: 5th
Date of Performance: 15/08/2025
Subject Name: DAA
Subject Code: 23CSH-301

1. **Aim:** Code implement power function in O(logn) time complexity.

2. **Objective:** To implement power function in O(logn) time complexity.

3. **Input/Apparatus Used:** In this program , power is divided by 2 in order to get complexity in log.

4. **Procedure/Algorithm: Pseudocode:**

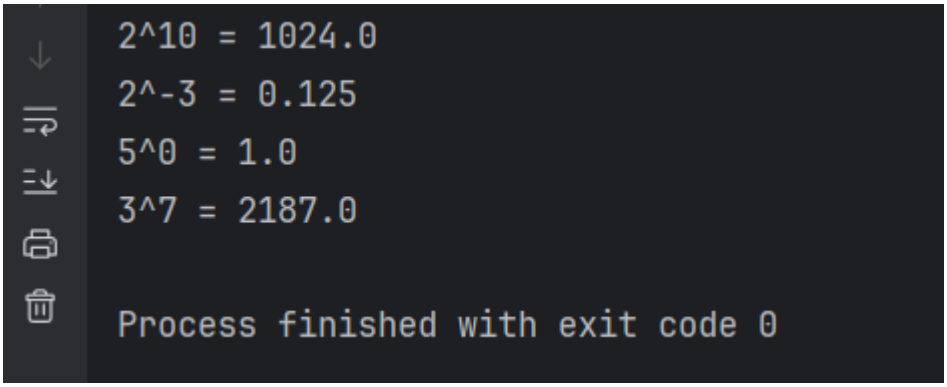
```
if(y==0):
return 1;
temp = power(x,y/2); if(y%2==0):
return temp*temp; else
return x*temp*temp;
```

Various possible cases
1)The power value can be 0
2)The power value can be negative.
3)The power value can be even.
4)The power value can be odd.

5. Code:

```java

class PowerFunction {

    static double power(double x, int y) {  5 usages
        if (y == 0) {
            return 1;
        }

        double temp = power(x, y: y / 2);

        if (y % 2 == 0) {
            return temp * temp;
        } else {
            if (y > 0) {
                return x * temp * temp;
            } else {
                return (temp * temp) / x;
            }
        }
    }

    public static void main(String[] args) {
        System.out.println("2^10 = " + power( x: 2,  y: 10));
        System.out.println("2^-3 = " + power( x: 2,  y: -3));
        System.out.println("5^0 = " + power( x: 5,  y: 0));
        System.out.println("3^7 = " + power( x: 3,  y: 7));
    }
}
```

6. Output:


2^10 = 1024.0
2^-3 = 0.125
5^0 = 1.0
3^7 = 2187.0
Process finished with exit code 0