

## EXPERIMENT 10

### Aim :

Write a program to implement Producer-Consumer problem using Threads.

### Code :

```
import java.util.LinkedList;

public class Threadexample {
    public static void main(String[] args) {
        throws InterruptedException {
            final PC pc = new PC();

            Thread t1 = new Thread(new Runnable() {
                @Override
                public void run() {
                    try {
                        pc.produce();
                    }
                    catch (InterruptedException e) {
                        e.printStackTrace();
                    }
                }
            });

            Thread t2 = new Thread(new Runnable() {
                @Override
                public void run(){
                    try {
                        pc.consume();
                    }
                    catch (InterruptedException e) {
                        e.printStackTrace();
                    }
                }
            });

            t1.start();
            t2.start();

            t1.join();
            t2.join();
        }
    }
}
```

```
public static class PC {

    LinkedList<Integer> list = new LinkedList<>();
    int capacity = 2;

    public void produce() throws InterruptedException {
        int value = 0;

        while (true) {
            synchronized (this) {
                while (list.size() == capacity)
                    wait();

                System.out.println("Producer produced-" + value);

                list.add(value++);
                notify();
                Thread.sleep(1000);
            }
        }
    }

    public void consume() throws InterruptedException {

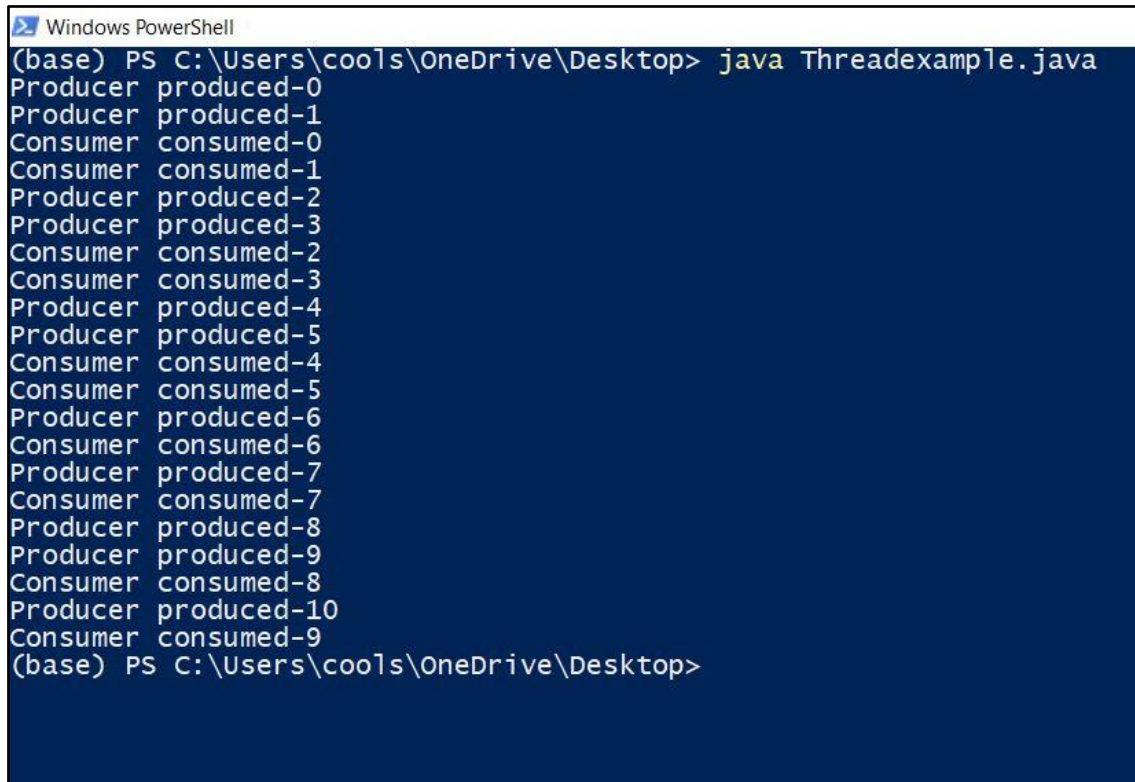
        while (true) {
            synchronized (this) {
                while (list.size() == 0)
                    wait();

                int val = list.removeFirst();

                System.out.println("Consumer consumed-" + val);

                notify();
                Thread.sleep(1000);
            }
        }
    }
}
```

Output Screenshot :

A screenshot of a Windows PowerShell terminal window. The title bar at the top reads "Windows PowerShell". The command prompt shows the user is in the directory "C:\Users\cools\OneDrive\Desktop" and has executed the command "java Threadexample.java". The output of the program is displayed as a series of alternating lines: "Producer produced-0", "Producer produced-1", "Consumer consumed-0", "Consumer consumed-1", "Producer produced-2", "Producer produced-3", "Consumer consumed-2", "Consumer consumed-3", "Producer produced-4", "Producer produced-5", "Consumer consumed-4", "Consumer consumed-5", "Producer produced-6", "Consumer consumed-6", "Producer produced-7", "Consumer consumed-7", "Producer produced-8", "Producer produced-9", "Consumer consumed-8", "Producer produced-10", and "Consumer consumed-9". The prompt "(base) PS C:\Users\cools\OneDrive\Desktop>" is visible at the bottom of the terminal window.

```
(base) PS C:\Users\cools\OneDrive\Desktop> java Threadexample.java
Producer produced-0
Producer produced-1
Consumer consumed-0
Consumer consumed-1
Producer produced-2
Producer produced-3
Consumer consumed-2
Consumer consumed-3
Producer produced-4
Producer produced-5
Consumer consumed-4
Consumer consumed-5
Producer produced-6
Consumer consumed-6
Producer produced-7
Consumer consumed-7
Producer produced-8
Producer produced-9
Consumer consumed-8
Producer produced-10
Consumer consumed-9
(base) PS C:\Users\cools\OneDrive\Desktop>
```