

BCSE-506L (Performance Analysis of Programming Languages Lab)**EXPERIMENT NO. W9A1**

Aim : Write a program to provide the solution for Producer Consumer Problem using wait() and notify() .

Source Code :

```

public class ProducerConsumer {
    public static void main(String[] args) {
        Shop c = new Shop();
        Producer p1 = new Producer(c, 1);
        Consumer c1 = new Consumer(c, 1);
        p1.start();
        c1.start();
    }
}

class Shop {
    private int materials;
    private boolean available = false;
    public synchronized int get() {
        while (!available) {
            try {
                wait();
            } catch (InterruptedException ie) {}
        }
        available = false;
        notifyAll();
        return materials;
    }
    public synchronized void put(int value) {
        while (available) {
            try {
                wait();
            } catch (InterruptedException ie) {
                ie.printStackTrace();
            }
        }
        materials = value;
        available = true;
        notifyAll();
    }
}

class Consumer extends Thread {
    private Shop Shop;
    private int number;
    public Consumer(Shop c, int number) {
        Shop = c;
        this.number = number;
    }
    public void run() {
        int value = 0;

```

```

        for (int i = 0; i < 10; i++) {
            value = Shop.get();
            System.out.println("Consumed value " + this.number +
" got: " + value);
        }
    }
}
class Producer extends Thread {
    private Shop Shop;
    private final int number;

    public Producer(Shop c, int number) {
        Shop = c;
        this.number = number;
    }
    public void run() {
        for (int i = 0; i < 10; i++) {
            Shop.put(i);
            System.out.println("Produced value " + this.number +
" put: " + i);
            try {
                sleep((int) (Math.random() * 100));
            } catch (InterruptedException ie) {
                ie.printStackTrace();
            }
        }
    }
}

```

Output :

```

"C:\Program Files\Java\jdk-19\bin\java.exe" "-javaagent:C:\Program
Files\JetBrains\....\

```

```

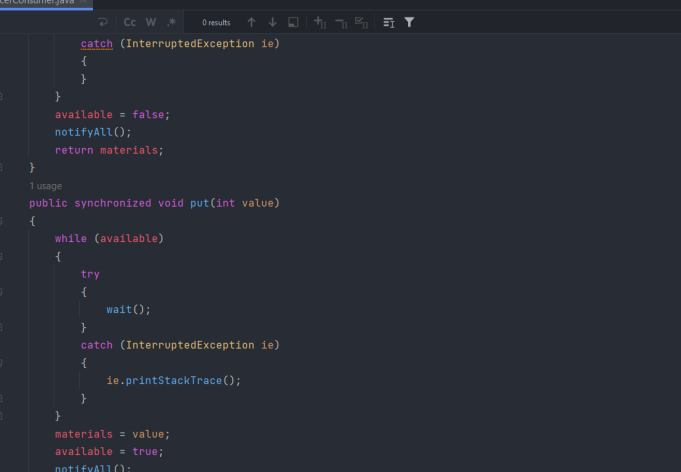
Consumed value 1 got: 0
Produced value 1 put: 0
Consumed value 1 got: 1
Produced value 1 put: 1
Consumed value 1 got: 2
Produced value 1 put: 2
Produced value 1 put: 3
Consumed value 1 got: 3
Produced value 1 put: 4
Consumed value 1 got: 4
Produced value 1 put: 5
Consumed value 1 got: 5
Produced value 1 put: 6
Consumed value 1 got: 6
Consumed value 1 got: 7
Produced value 1 put: 7
Produced value 1 put: 8
Consumed value 1 got: 8
Produced value 1 put: 9
Consumed value 1 got: 9

```

Process finished with exit code 0

Input From IDE :

```
File Edit View Navigate Code Refactor Build Run Tools VCS Window Help Rajni - ProducerConsumer.java
Rajni ProducerConsumer.java Shop . get
Project
< Q: Cc W * 0 results: ↑ ↓ ↶ ↷ ↵ ↶ ↷ ↵
1 public class ProducerConsumer
2 {
3     public static void main(String[] args)
4     {
5         Shop c = new Shop();
6         Producer p1 = new Producer(c, number: 1);
7         Consumer c1 = new Consumer(c, number: 1);
8         p1.start();
9         c1.start();
10    }
11 }
12 6 usages
13 class Shop
14 {
15     2 usages
16     private int materials;
17     4 usages
18     private boolean available = false;
19     1 usage
20     public synchronized int get()
21     {
22         while (!available)
23         {
24             try
25             {
26                 wait();
27             }
28             catch (InterruptedException ie)
29             {
30             }
31         }
32     }
33 }
```

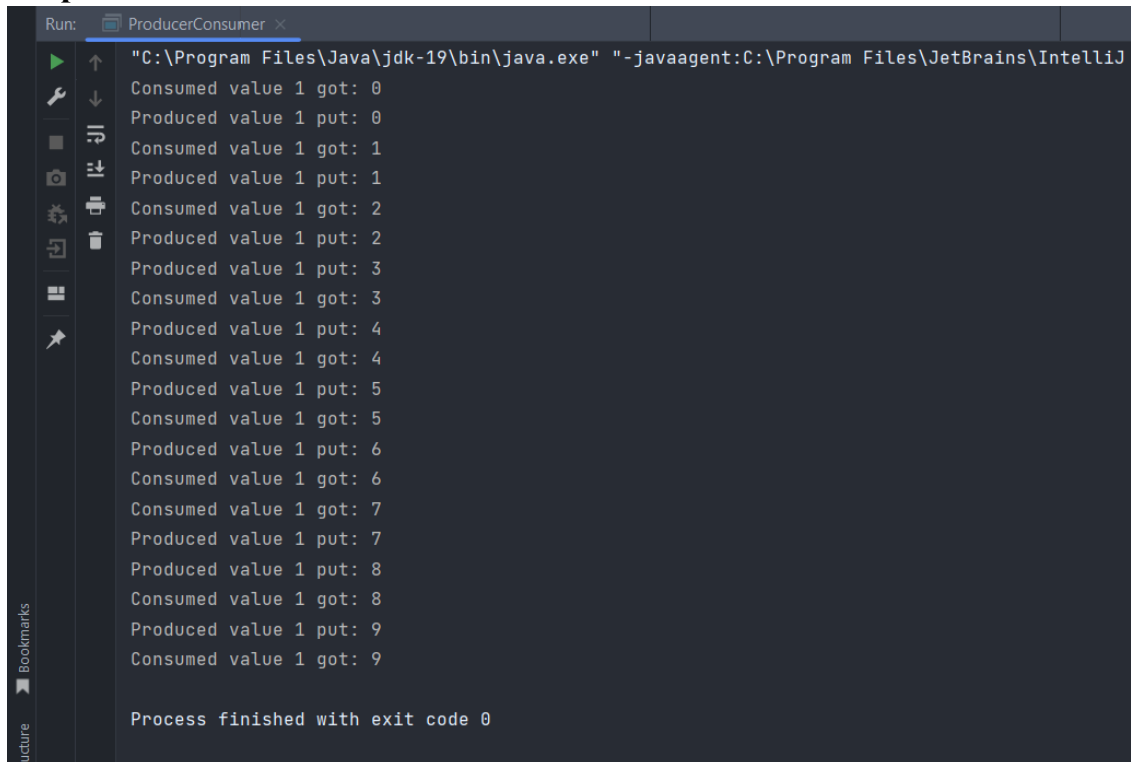


```
File Edit View Navigate Code Refactor Build Run Tools VCS Window Help
Rajni | ProducerConsumer.java | Consumer

- ProducerConsumer.java
1 Q: C C W * 0 results ↑ ↓ □ H L B T E T Y
24:         catch (InterruptedException ie)
25:         {
26:         }
27:     }
28:     available = false;
29:     notifyAll();
30:     return materials;
31: }
32: 1 usage
33: public synchronized void put(int value)
34: {
35:     while (available)
36:     {
37:         try
38:         {
39:             wait();
40:         }
41:         catch (InterruptedException ie)
42:         {
43:             ie.printStackTrace();
44:         }
45:     }
46:     materials = value;
47:     available = true;
48:     notifyAll();
49: }
50: 2 usages
51: class Consumer extends Thread
```

[illegible]

Output IDE :



```
Run: ProducerConsumer x
"C:\Program Files\Java\jdk-19\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ
Consumed value 1 got: 0
Produced value 1 put: 0
Consumed value 1 got: 1
Produced value 1 put: 1
Consumed value 1 got: 2
Produced value 1 put: 2
Produced value 1 put: 3
Consumed value 1 got: 3
Produced value 1 put: 4
Consumed value 1 got: 4
Produced value 1 put: 5
Consumed value 1 got: 5
Produced value 1 put: 6
Consumed value 1 got: 6
Consumed value 1 got: 7
Produced value 1 put: 7
Produced value 1 put: 8
Consumed value 1 got: 8
Produced value 1 put: 9
Consumed value 1 got: 9

Process finished with exit code 0
```

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SECTION B3