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EXPERIMENT NO – 6  
PRODUCER CONSUMER SEMAPHORE

CODE:

```
import java.util.Random;
import java.util.Scanner;

public class Main {
    private static final int n = 8;
    private static int[] buffer = new int[n];
    private static int in = -1;
    private static int out = -1;
    private static int s = 1;
    private static int empty = n;
    private static int full = 0;
    private static int itemp;
    private static int itemc;

    private static int wait(int s) {
        s--;
        while (s < 0)
            s--;
        return s;
    }

    private static int signal(int s) {
        s++;
        return s;
    }

    private static void producer() {
        s = wait(s);
        Random rand = new Random();
        itemp = rand.nextInt(100);
        if (full == n) {
            System.out.println("Buffer full");
        } else if (in == -1 && out == -1) {
            empty = wait(empty);
            in = 0;
            out = 0;
            buffer[in] = itemp;
            System.out.println("item produced is " + itemp);
            full = signal(full);
        } else {
            empty = wait(empty);
        }
    }
}
```

```

        in = (in + 1) % n;
        buffer[in] = itemp;
        System.out.println("item produced is " + itemp);
        full = signal(full);
    }
    s = signal(s);
}

```

```

private static void consumer() {
    s = wait(s);
    if (in == -1 && out == -1) {
        System.out.println("Buffer empty");
    } else if (in == out) {
        full = wait(full);
        itemc = buffer[out];
        buffer[out] = -1;
        in = out = -1;
        System.out.println("Item consumed is " + itemc);
        empty = signal(empty);
    } else {
        full = wait(full);
        itemc = buffer[out];
        buffer[out] = -1;
        out = (out + 1) % n;
        System.out.println("Item consumed is " + itemc);
        empty = signal(empty);
    }
    s = signal(s);
}

```

```

private static void display() {
    if (in == -1) {
        System.out.println("Buffer empty");
    } else {
        for (int i = 0; i < n; i++) {
            if (buffer[i] == -1)
                System.out.print("-\t");
            else
                System.out.print(buffer[i] + "\t");
        }
        System.out.println();
    }
}

```

```

public static void main(String[] args) {
    int ch = 4;
    for (int i = 0; i < n; i++)
        buffer[i] = -1;
    System.out.println("Name - Pinky Pamecha ,Sapid - 60004220056 ,Rollno -C114");
    System.out.println("Main Menu");
    System.out.println("1.produce");
}

```

```
System.out.println("2.consume");
System.out.println("3.display");
System.out.println("4.Exit");
Scanner scanner = new Scanner(System.in);
do {
    ch = scanner.nextInt();
    switch (ch) {
        case 1:
            producer();
            break;
        case 2:
            consumer();
            break;
        case 3:
            display();
            break;
        case 4:
            System.out.println("Thank you");
            break;
        default:
            System.out.println("Invalid");
    }
} while (ch != 4);
}
```

OUTPUT:

```
java -cp /tmp/5Pgei2bHfd Main
```

```
Name - Pinky Pamecha ,Sapid - 60004220056 ,Rollno -C114
```

```
Main Menu
```

```
1.produce
```

```
2.consume
```

```
3.display
```

```
4.Exit
```

```
2
```

```
Buffer empty
```

```
1
```

```
item produced is 66
```

```
1
```

```
item produced is 36
```

```
1
```

```
item produced is 79
```

```
3
```

```
66 36 79 - - - - -
```

```
2
```

```
Item consumed is 66
```

```
3
```

```
- 36 79 - - - - -
```

```
1
```

```
item produced is 23
```

```
1
```

```
item produced is 11
```

```
1
```

```
item produced is 29
```

```
1
```

```
item produced is 97
```

```
1
```

```
item produced is 42
```

```
3
```

```
- 36 79 23 11 29 97 42
```

```
1
```

```
item produced is 20
```

```
3
```

## Output

Clear

```
2.consume
3.display
4.Exit
2
Buffer empty
1
item produced is 66
1
item produced is 36
1
item produced is 79
3
66 36 79 - - - - -
2
Item consumed is 66
3
- 36 79 - - - - -
1
item produced is 23
1
item produced is 11
1
item produced is 29
1
item produced is 97
1
item produced is 42
3
- 36 79 23 11 29 97 42
1
item produced is 20
3
20 36 79 23 11 29 97 42
1
Buffer full
```



31°C Smoke



ENG

11:19

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