



SNS COLLEGE OF ENGINEERING



Kurumbapalayam(Po), Coimbatore - 641 107

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Department of Information Technology

19CS204 OBJECT ORIENTED PROGRAMMING

I YEAR /II SEMESTER

Topic - Interthread Communication



**Thread Synchronization/
kamalakkannan R / CSE-IOT /SNSCE**



Interthread Communication

- **Inter-thread communication** is all about allowing **synchronized threads to communicate with each other.**
- Inter thread communication in **Java is a technique** through which **multiple threads communicate with each other.**
- It provides an efficient way through which more than one thread communicate with each other by reducing **CPU idle time.** CPU idle time is a process in which CPU cycles are not wasted.
- Inter-thread communication is a mechanism in which a **thread is paused running in its critical section** and **another thread is allowed to enter (or lock) in the same critical section to be executed.**
- It is implemented by following methods of **Object class**:
 - wait()
 - notify()
 - notifyAll()



Interthread Communication

wait() method

- Causes current thread to release the lock and wait until either another thread invokes the notify() method or the notifyAll() method for this object, or a specified amount of time has elapsed.

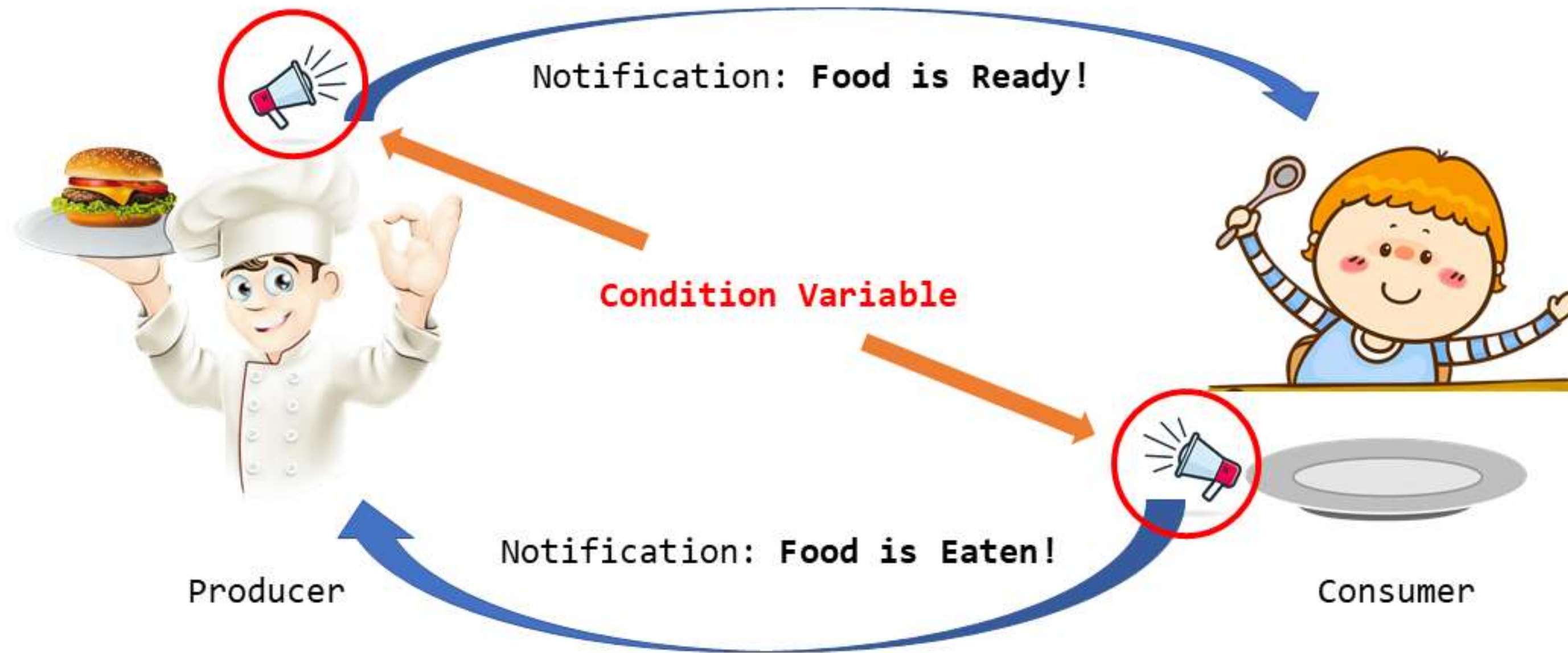
notify() method

- **Wakes up a single thread that is waiting on this object's monitor.** If any threads are waiting on this object, one of them is chosen to be awakened.
- **Syntax:**
- **public final void notify()**

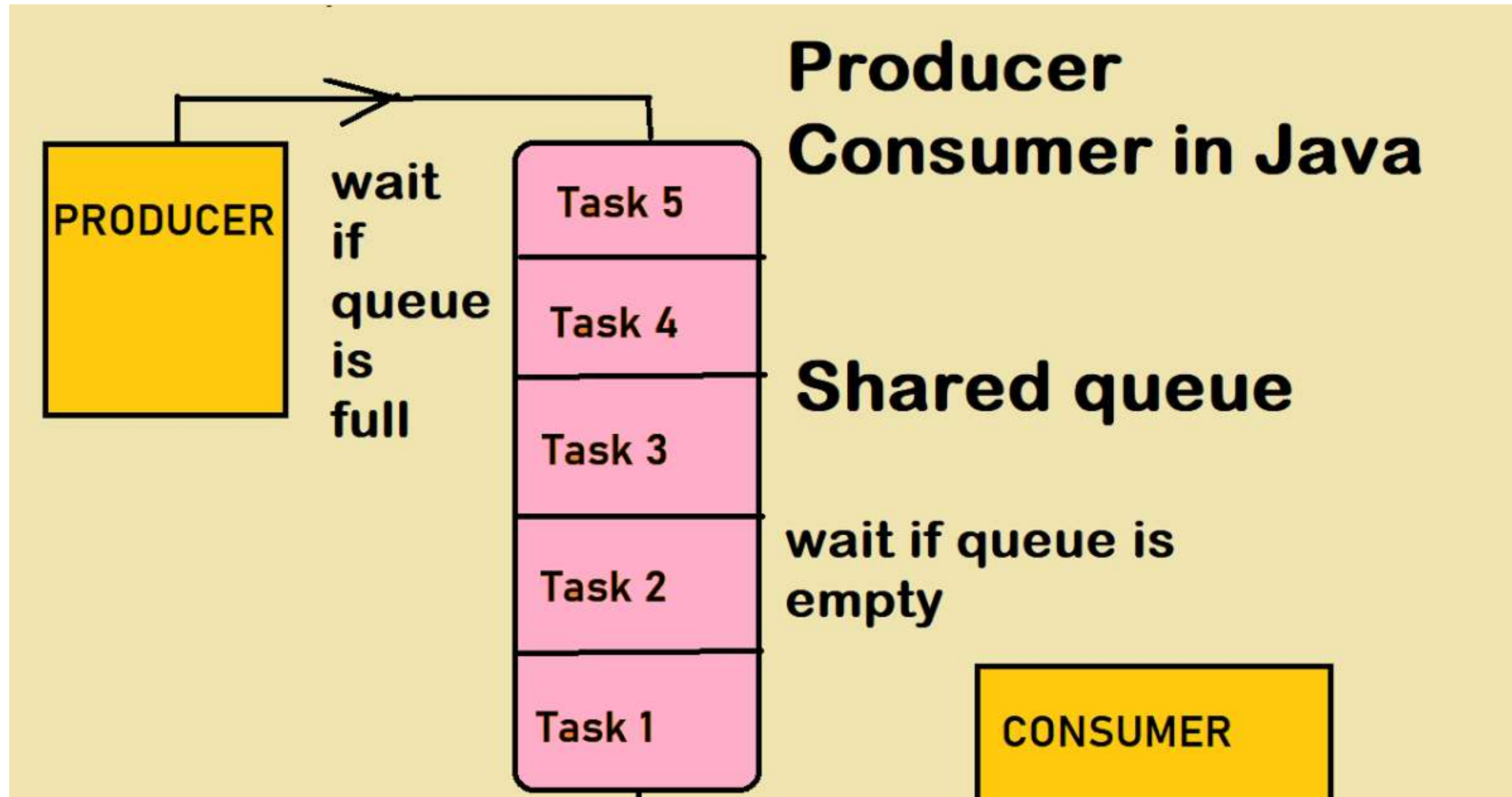
notifyAll() method

- **Wakes up all threads that are waiting on this object's monitor.**
- **Syntax:**
- **public final void notifyAll()**

Interthread Communication

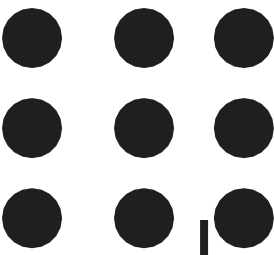


Interthread Communication





Interthread Communication

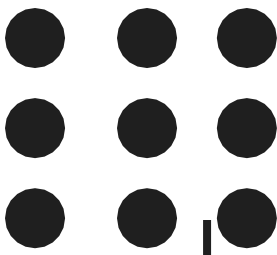


```
public class A
{
int i;
synchronized void deliver(int i)
{
    this.i = i;
    System.out.println("Data Produced: " +i);
}
synchronized int receive()
{
    System.out.println("Data Consumed: " + i);
    return i;
} }
public class producer extends Thread
{
A obj;
producer(A obj)
{
    this.obj = obj;
}
public void run()
{
for(int j = 1; j <= 5; j++){
    obj.deliver(j);
} } }
```

```
public class consumer extends Thread
{
A obj;
consumer(A obj)
{
    this.obj = obj;
}
public void run()
{
for(int k = 0; k <= 5; k++){
    obj.receive();
}
}
}
public class NoCommunication
{
public static void main(String[] args)
{
A obj = new A();
producer t1 = new producer(obj);
consumer t2 = new consumer(obj);
    t1.start();
    t2.start();
}
}
```



Interthread Communication



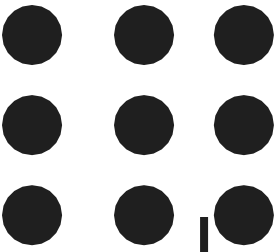
```
public class A
{
    int i;
    boolean flag = false; // flag will be true when data production is over.
    synchronized void deliver(int i)
    {
        if(flag)
        try
        {
            wait(); }
        catch(InterruptedException ie)
        {
            System.out.println(ie);
        }
        this.i = i;
        flag = true; // When data production is over, it will store true into flag.
        System.out.println("Data Produced: " +i);
        notify(); // When data production is over, it will notify Thread2 to use it.
    }
    synchronized int receive()
    {
        if(!flag)
        try {
            wait(); // Wait till a notification is received from Thread1.
        }
        catch(InterruptedException ie){
            System.out.println(ie);
        }
        System.out.println("Data Consumed: " + i);
        flag = false; // It will store false into flag when data is received.
        notify(); // When data received is over, it will notify Thread1 to produce next data.
        return i;
    }
}
```

```
public class produced extends Thread
{
    A obj;
    produced(A obj)
    {
        this.obj = obj;
    }
    public void run()
    {
        for(int j = 1; j <= 5; j++){
            obj.deliver(j);
        }
    }
}
public class consumed extends Thread
{
    A obj;
    consumed(A obj)
    {
        this.obj = obj;
    }
    public void run()
    {
        for(int k = 0; k <= 5; k++){
            obj.receive();
        }
    }
}
```





Interthread Communication



```
public class Communication
{
public static void main(String[] args)
{
A obj = new A(); // Creating an object of class A.

// Creating two thread objects and pass reference variable obj as parameter to Thread1 and
Thread2.
produced t1 = new produced(obj);
consumed t2 = new consumed(obj);
// Run both threads.
t1.start();
t2.start();
}
}
```




THANK YOU