



SNS COLLEGE OF ENGINEERING



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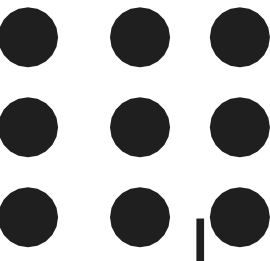
Department of Information Technology

19CS204 OBJECT ORIENTED PROGRAMMING

I YEAR /II SEMESTER

Topic - Thread Methods





Thread methods

Using `isAlive()` and `join()`

- In all the practical situations main thread should finish last else other threads which have spawned from the main thread will also finish.
- To accomplish main thread to finish last we have called `sleep()` within `main()` in previous example with a long enough delay to ensure that all child threads terminate prior to the main thread.
- How can one thread know when another thread has ended?
- Two ways exist to determine whether a thread has finished.
- One is `isAlive()` and another is `join()`



Thread methods

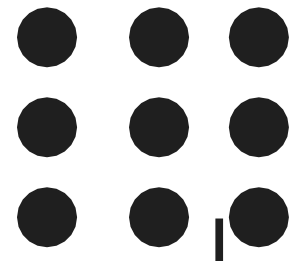


Using `isAlive()` and `join()`

- First, you can call `isAlive()` on the thread. Its general form is shown here:
 - *final boolean isAlive()*
- The `isAlive()` method returns true if the thread upon which it is called is still running. It returns false otherwise.
- Another way to achieve this by using `join()` method, this method when called from the parent thread makes parent thread wait till child thread terminates.
 - *final void join()* throws `InterruptedException`
- This method waits until the thread on which it is called terminates.



Thread methods

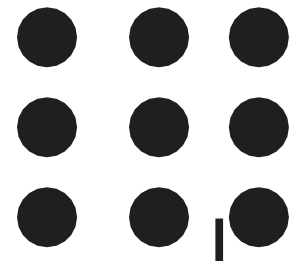


Example – isAlive()

```
public class JavaIsAliveExp extends Thread
{
    public void run()
    {
        try
        {
            Thread.sleep(300);
            System.out.println("is run() method isAlive "+Thread.currentThread().isAlive());
        }
        catch (InterruptedException ie) {
        }
    }
    public static void main(String[] args)
    {
        JavaIsAliveExp t1 = new JavaIsAliveExp();
        System.out.println("before starting thread isAlive: "+t1.isAlive());
        t1.start();
        System.out.println("after starting thread isAlive: "+t1.isAlive());
    }
}
```



Thread methods

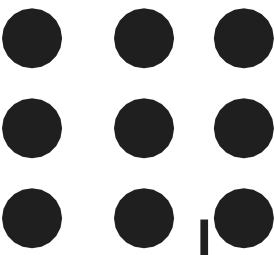


Example – join()

```
public class TestJoinMethod1 extends Thread{
    public void run(){
        for(int i=1;i<=5;i++){
            try{
                Thread.sleep(500);
            }catch(Exception e){System.out.println(e);}
            System.out.println(i);
        } }
    public static void main(String args[]){
        TestJoinMethod1 t1=new TestJoinMethod1();
        TestJoinMethod1 t2=new TestJoinMethod1();
        TestJoinMethod1 t3=new TestJoinMethod1();
        t1.start();
        try{
            t1.join();
        }catch(Exception e){System.out.println(e);}
        t2.start();
        /*try{
            t2.join();
        }catch(Exception e){System.out.println(e);} */
        t3.start();
    } }
```



Thread methods



Example : isAlive() and join()

```
class NewThread implements Runnable {
String name; // name of thread
Thread t;
NewThread(String threadname) {
name = threadname;
t = new Thread(this, name);
System.out.println("New thread: " + t);
t.start(); // Start the thread
}
// This is the entry point for thread.
public void run() {
try {
for(int i = 5; i > 0; i--) {
System.out.println(name + ": " + i);
Thread.sleep(1000);
}
} catch (InterruptedException e) {
System.out.println(name + " interrupted.");
}
System.out.println(name + " exiting.");
}
}
```

```
class DemoJoin {
public static void main(String args[]) {
NewThread ob1 = new NewThread("One");
NewThread ob2 = new NewThread("Two");
NewThread ob3 = new NewThread("Three");
System.out.println("Thread One is alive: " + ob1.t.isAlive());
System.out.println("Thread Two is alive: " + ob2.t.isAlive());
System.out.println("Thread Three is alive: " + ob3.t.isAlive());
// wait for threads to finish
try {
System.out.println("Waiting for threads to finish.");
ob1.t.join();
ob2.t.join();
ob3.t.join();
} catch (InterruptedException e) {
System.out.println("Main thread Interrupted");
}
System.out.println("Thread One is alive: " + ob1.t.isAlive());
System.out.println("Thread Two is alive: " + ob2.t.isAlive());
System.out.println("Thread Three is alive: " + ob3.t.isAlive());
System.out.println("Main thread exiting.");
} }
```



Thread methods



Thread Priorities

- Thread priorities are used by the thread scheduler to decide when each thread should be allowed to run.
- In theory, over a given period of time, higher-priority threads get more CPU time than lower-priority threads.
- Thread priority decides when to switch from one running thread to another, process is called context switching
- A higher-priority thread can also preempt a lower-priority one.
- To set a thread's priority, use the `setPriority()` method, which is a member of `Thread`.
This is its general form:
`final void setPriority(int level)`
- Here, `level` specifies the new priority setting for the calling thread.



Thread methods



Thread Priorities

- In place of defining the priority in integers, we can use `MIN_PRIORITY`, `NORM_PRIORITY` or `MAX_PRIORITY`.
- The value of level must be within the range `MIN_PRIORITY` and `MAX_PRIORITY`.
- Currently, these values are 1 and 10, respectively.
- To return a thread to default priority, specify `NORM_PRIORITY`, which is currently 5.
- These priorities are defined as static final variables within Thread. For example
 - `public static int MIN_PRIORITY`
- You can obtain the current priority setting by calling the `getPriority()` method of Thread, shown here:
`final int getPriority()`



Thread methods



Thread Priorities

```
public class TestMultiPriority1 extends Thread{
    public void run(){
        System.out.println("running thread name is:"+Thread.currentThread().getName());
        System.out.println("running thread priority is:"+Thread.currentThread().getPriority());

    }
    public static void main(String args[]){
        TestMultiPriority1 m1=new TestMultiPriority1();
        TestMultiPriority1 m2=new TestMultiPriority1();
        TestMultiPriority1 m3=new TestMultiPriority1();
        System.out.println("Default Priority: "+Thread.currentThread().getPriority());
        m1.setPriority(Thread.MIN_PRIORITY);
        m2.setPriority(Thread.MAX_PRIORITY);
        m3.setPriority(Thread.NORM_PRIORITY);
        m1.start();
        m2.start();
        m3.start();
    }
}
```



THANK YOU