Sri SAI RAM ENGINEERING COLLEGE
INSTITUTE OF TECHNOLOGY
West Tambaram, Chennai - 44

SAIRAM DIGITAL RESOURCES

YEAR II SEM III

CS8392

OBJECT ORIENTED PROGRAMMING
(Common to CSE, EEE, EIE, ICE, IT)

COMPUTER SCIENCE & ENGINEERING

UNIT NO 4

MULTITHREADING AND GENERIC PROGRAMMING

4.6 DAEMON THREADS,THREAD GROPUS

DAEMON THREADS

- Java offers two types of threads: user threads and daemon threads.

- User threads are threads which are created by the application or user. They are high-priority threads. The JVM will wait for any user thread to complete its task before terminating it.

- On the other hand, Daemon threads are threads which are mostly created by the JVM. These threads are low-priority threads whose only role is to provide services to user threads.

DAEMON THREADS

•Daemon thread is a low priority thread that runs in background to perform tasks such as garbage collection. Its life depend on the mercy of user threads i.e. when all the user threads dies, JVM terminates this thread automatically.

Uses of Daemon Threads:

•:Daemon threads are useful for background supporting tasks such as garbage collection, releasing memory of unused objects and removing unwanted entries from the cache . Most of the JVM threads are daemon threads.

Properties:

1.A user thread can be changed to Daemon thread by using setDaemon() method of thread class.

2.public boolean isDaemon(): This method is used for checking the status of a thread. It returns true if the thread is Daemon else it returns false.

DAEMON THREADS

3.setDaemon() method can only be called before starting the thread. This method would throw IllegalThreadStateException if you call this method after Thread.start() method.

Methods:

The java.lang.Thread class provides two methods for java daemon thread.

Sl.No	Method	Description
1.	public void setDaemon(boolean status)	is used to mark the current thread as daemon thread or user thread.
2.	Public Boolean isDaemon()	is used to check that current thread is daemon or not

DAEMON THREADS

```
public class DaemonThreadExample1 extends Thread{
public void run(){
if(Thread.currentThread().isDaemon()){ System.out.println("Daemon thread executing");
}
else{
System.out.println("user(normal) thread executing");
}
}
public static void main(String[] args)
{
DaemonThreadExample1 t1=new DaemonThreadExample1();
DaemonThreadExample1 t2=new DaemonThreadExample1();
t1.setDaemon(true);
t1.start();
t2.start();
}
}
```

Output:

```
Daemon thread executing
user(normal) thread executing
```

THREAD GROUPS

- Thread group in java is used to **group similar threads into one unit**. A thread group can also contain other thread groups.

- Thread groups are constructed using **java.lang.ThreadGroup class**

- The main use of thread groups is that you can handle multiple threads simultaneously. In such way, we can suspend, resume or interrupt group of threads by a **single method call.**

Constructors of ThreadGroup class:

There are only two constructors of ThreadGroupclass.

Sl.No	Constructor	Description
1	ThreadGroup(String name)	creates a thread group with given name.
2	ThreadGroup(ThreadGroup parents String name)	creates a thread group with given parent group and name.

THREAD GROUPS

Important methods of ThreadGroup class:
There are many methods in ThreadGroup class. A list of important methods are given below.

Sl.No	Method	Description
1	intactiveCount()	returns no. of threads running in current group.
2	intactiveGroupCount()	returns a no. of active group in this thread group.
3	void destroy()	destroys this thread group and all its sub groups.
4	String getName()	returns the name of this group.
5	ThreadGroupgetParent()	returns the parent of this group.
6	void interrupt()	interrupts all threads of this group.
7	void list()	prints information of this group to standard console.

THREAD GROUPS

How To Add Threads To Thread Group:

While creating the threads itself, specify it's group using constructor which takes ThreadGroup and name of a thread as arguments.

EXAMPLE FOR THREADGROUP CLASS:

```
public class ThreadGroupInJava
{
public static void main(String[] args)
{
        //Creating Parent Thread Group
        ThreadGroup parentGroup = new ThreadGroup("Parent Thread Group");

        //Adding threads to ThreadGroup while creating threads itself
        Thread t1 = new Thread(parentGroup, "Thread 1");
        Thread t2 = new Thread(parentGroup, "Thread 2");

        //Creating child thread group
        ThreadGroup childGroup = new ThreadGroup(parentGroup, "Child Thread Group");
```

THREAD GROUPS

```
//Adding a thread to child thread group
Thread t3 = new Thread(childGroup, "Thread 3");
System.out.println(childGroup.getParent());
parentGroup.setDaemon(true);
//Checking the daemon property of thread group
System.out.println(parentGroup.isDaemon());
}
}
```

OUTPUT:

java.lang.ThreadGroup [name=Parent Thread Group ,maxpri=10]

True

THREAD GROUPS

How to interrupt all threads in a group:

interrupt() Method is used to interrupt all threads in a group. public class ThreadsInJava

```
{
public static void main(String[] args)
{
//Creating Thread Group
ThreadGroup parentGroup = new ThreadGroup("Parent Group ");
Thread t1 = new Thread(parentGroup, "Thread 1")
{
public void run()
{
try
{
Thread.sleep(5000);
}
catch (InterruptedException e)
{
System.out.println("Thread interrupted");
}
}
};
```

THREAD GROUPS

```
t1.start();
Thread t2 = new Thread(parentGroup, "Thread 2")
{
public void run()
{
try
{
Thread.sleep(5000);
}
catch (InterruptedException e)
{
System.out.println("Thread interrupted");
}
}
};
t2.start();
ThreadGroup childGroup = new ThreadGroup(parentGroup, "Child Group");
Thread t3 = new Thread(childGroup, "Thread 3")
{
public void run()
{
try
```

THREAD GROUPS

```
{
Thread.sleep(5000);
}
catch (InterruptedException e)
{
System.out.println("Thread interrupted");
}
}
};
t3.start();
//Interrupting whole group
parentGroup.interrupt();     // similarly parentGroup.destroy(); can also be used to
//destroy the whole thread group and it's subgroups.
}
}
```

Daemon Threads

https://www.youtube.com/watch?v=kOEmsqk-Wkg

https://www.youtube.com/watch?v=x7G4DOM_VFw

https://www.youtube.com/watch?v=zdYPQH7aR8k

THREAD GROUPS:

https://www.youtube.com/watch?v=GZbf6FXWmps

https://www.youtube.com/watch?v=vagEh_Y99uY