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## **What is a Java Thread?**

## What is a Java Thread?



Thread is a lightweight sub process

It is the smallest independent unit of a program

Contains a separate path of execution

Every Java program contains at least one thread

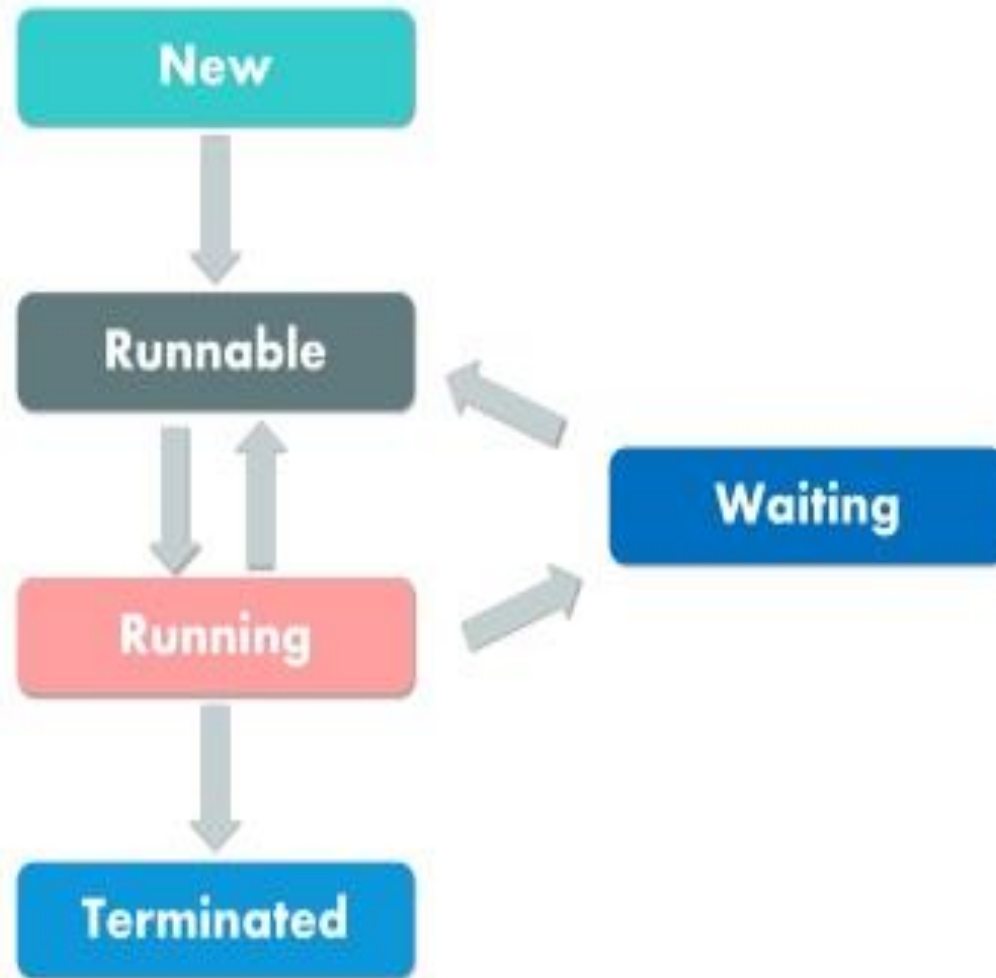
A thread is created & controlled by the `java.lang.Thread` class



# Java Thread Life-Cycle

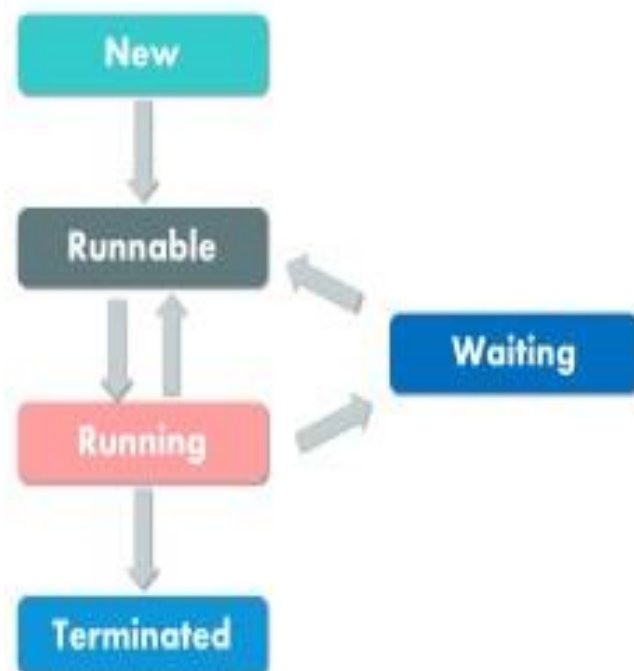
# Thread Lifecycle

A Java thread can lie only in one of the shown states at any point of time





# Thread Lifecycle



## New

A new thread begins its life cycle in this state & remains here until the program starts the thread. It is also known as a **born thread**.

## Runnable

Once a newly born thread starts, the thread comes under *runnable* state. A thread stays in this state is until it is executing its task.

## Running

In this state a thread starts executing by entering `run()` method and the `yield()` method can send them to go back to the *Runnable* state.

## Waiting

A thread enters this state when it is temporarily in an inactive state i.e it is still alive but is not eligible to run. It is can be in waiting, sleeping or blocked state.

## Terminated

A runnable thread enters the terminated state when it completes its task or otherwise terminates.

## Creating A Thread

A thread in Java can be created using two ways

Thread Class

```
public class Thread  
    extends Object  
    implements Runnable
```

Runnable Interface

```
public interface Runnable
```

## Thread Class

VS

## Runnable Interface

- ✓ Each Thread creates its unique object
- ✓ More memory consumption
- ✓ A class extending Thread class can't extend any other class
- ✓ Thread class is extended only if there is a need of overriding other methods of it
- ✓ Enables tight coupling

- ✓ Each Thread creates its unique object
- ✓ More memory consumption
- ✓ Along with Runnable a class can implement any other interface
- ✓ Runnable is implemented only if there is a need of special run method
- ✓ Enables loose coupling



# Java Main Thread

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Main thread is the most important thread of a Java Program

It is executed whenever a Java program starts

Every program must contain this thread for its execution to take place

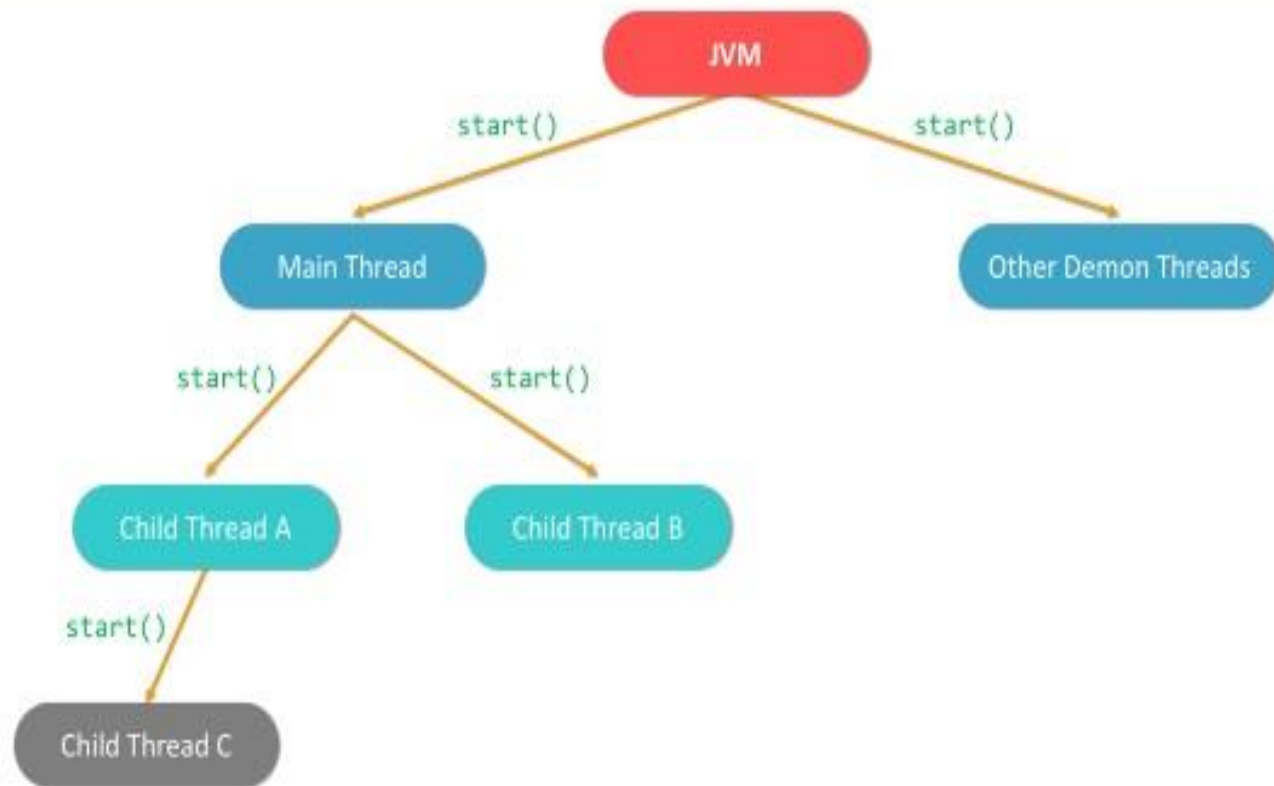
Java main Thread is needed because of the following reasons

1. From this other "child" threads are spawned

2. It must be the last thread to finish execution i.e when the main thread stops program terminates

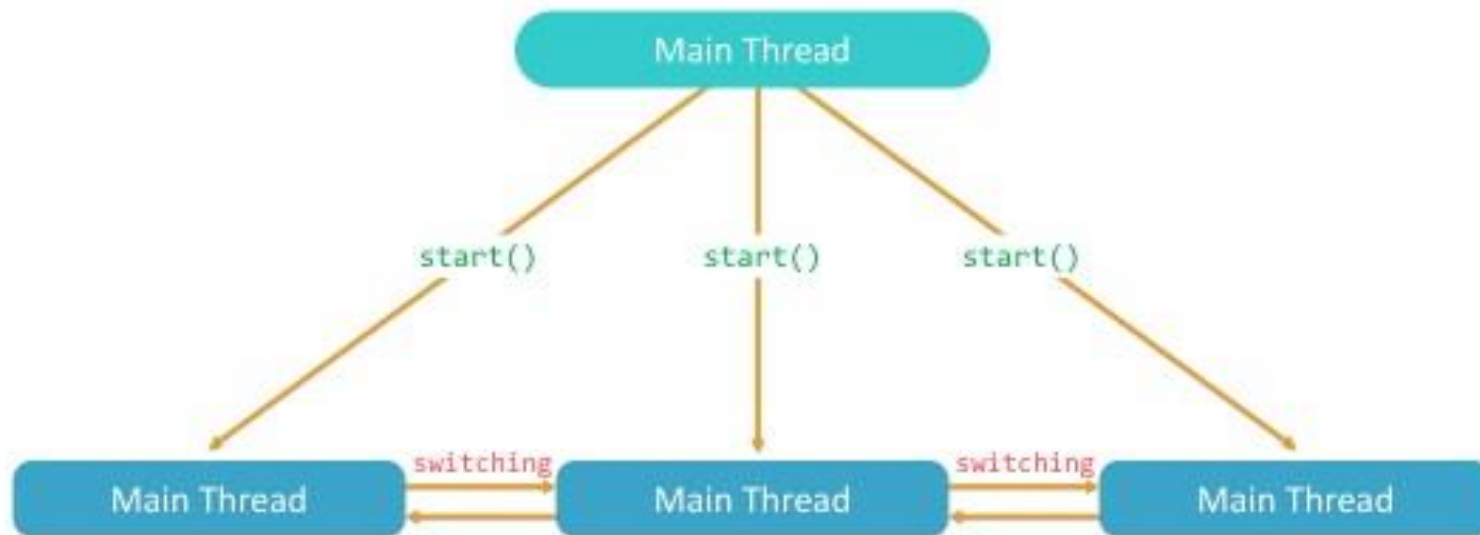


# Java Main Thread



# Multi – Threading

Multi threading is the ability of a program to run two or more threads concurrently, where each thread can handle a different task at the same time making optimal use of the available resources





**THANKS!**