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JAVA – Memory management

**Differentiate between Serial and Throughput Garbage collectors?**

Serial Garbage collector uses one thread to perform garbage collection in Java. On the other hand, Throughput garbage collector uses multiple threads to perform garbage collection.

We can use Serial Garbage Collector for applications that run on client-style machines and do not have low pause time requirements. Throughput Garbage Collector can be chosen for applications that have low pause time requirements.

**What is DGC? And how does it work?**

**Answer.** DGC in Java stands for Distributed Garbage Collection. DGC is used by Remote Method Invocation (RMI) for automatic garbage collection. As RMI involves remote object references across Java Virtual Machine, the garbage collection process can be quite difficult. The Distributed garbage Collector uses a reference counting algorithm to provide automatic memory management for remote objects.

**Which are the different segments of memory?**

**Answer.**

1. Stack Segment: The stack segment contains the local variables and reference variables. Reference variables hold the address of an object in the heap segment.
2. Heap Segment: The heap segment contains all the objects that are created during runtime. It stores objects and their attributes (instance variables).
3. Code Segment: The code segment stores the actual compiled Java bytecodes when loaded.

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**Describe the working of a garbage collector in Java.**

**Answer.** Java Runtime Environment(JRE) automatically deletes objects when it determines that they are no longer useful. This process is called garbage collection in Java. Java runtime supports a garbage collector that periodically releases the memory from the objects that are no longer in need.

The Java Garbage collector is a mark and sweeps garbage collector. It scans dynamic memory areas for objects and marks those objects that are referenced. After finding all the possible paths to objects are investigated, those objects that are not marked or not referenced) are treated like garbage and are collected.

**What is the PermGen or Permanent Generation?**

**Answer.** PermGen is a memory pool that contains all the reflective data of the Java Virtual Machine(JVM), such as class, objects, and methods, etc. The Java virtual machines that use class data sharing, the generation is divided into read-only and read-write areas. Permanent generation contains the metadata required by JVM to describe the classes and methods used in Java application. Permanent Generation is populated by the JVM during the runtime on the basis of classes used by the application. Additionally, Java SE(Software Edition) library classes and methods may also be stored in the PermGen or Permanent generation.

**What is a metaspace?**

**Answer.** The Permanent Generation or PermGen space has been completely removed and replaced by a new space called Metaspace. The result of removing the PermGen removal is that the PermSize and MaxPermSize JVM arguments are ignored and we will never get a java.lang.OutOfMemoryError: PermGen error.