**1.Memory Leak** :-

* **Memory leak means unused objects occupy unnecessary space in memory.**
* **unused objects are typically removed by the Java Garbage Collector but in cases where objects are still being referenced, they are not eligible to be removed.**

**How to avoid memory leak:-**

1. Release the session when it is no longer needed. ...
2. Keep the time-out time low for each session.
3. Store only the necessary data in your Http Session.
4. Avoid using string concatenation.

**2.Root causes for out of memory error in java:-**

* It occurs when JVM unable to allocate an object due to insufficient space in the Java heap.
* The application code could be referencing large objects for too long that is not required or trying to process large amounts of data at a time.

**3.java -Xms256m -Xmx2048m :-**

* This means, JVM will start up with 256 MB of memory and will allow the process to use up to 2048 MB of memory

**4.Java memory model :-**

The Java memory model specifies --

* how the Java virtual machine works with the computer's memory (RAM).
* how and when different threads can see values written to shared variables by other threads,
* how to synchronize access to shared variables when necessary.

**5.String Pool**

* A string constant pool is a separate place in the heap memory where the values of all the strings which are defined in the program are stored.
* When we declare a string, an object of type String is created in the stack, while an instance with the value of the string is created in the heap.
* String pool helps in saving a lot of space for Java Runtime although it takes more time to create the String.