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## Section 01

```
import java.util.List;
import java.util.ArrayList;

public class PerformanceTest {

    public static void main(String[] args) {

        // Create a collection of SomeObject
        List<SomeObject> list = new ArrayList<SomeObject>();
        int size = 10000;
        for (int i = 0; i < size; i++) {
            list.add(new SomeObject(i, "some string"));
        }

        Runtime runtime = Runtime.getRuntime();
        runtime.gc();

        long memory = runtime.totalMemory() - runtime.freeMemory();

        long objSize = getObjectSize(list.get(0));
        long collectionSize = objSize * size;

        System.out.println("Size of the stored object: " + objSize + " bytes");
        System.out.println("Size of the stored collection: " + collectionSize + " bytes");
        System.out.println("Used memory: " + memory + " bytes");
        System.out.println("Memory overhead: " + (memory-collectionSize) + " bytes");
    }

    public static long getObjectSize(Object obj) {
        Runtime runtime = Runtime.getRuntime();
        runtime.gc();
        long size = runtime.totalMemory() - runtime.freeMemory();
        return size;
    }
}

class SomeObject {

    private int value;
    private String text;

    public SomeObject(int value, String text) {
        this.value = value;
        this.text = text;
    }
}
```

## Section 02

changing the imported libraries as their respective type and  
change creating methods of collection as their method

Change the getsizeobject calling param for their respective  
argument

## Section 03

### Arraylist

```
[Running] cd "c:\Users\hari2\Desktop\Code\Java\Main\src\" && javac PerformanceTest.java && java PerformanceTest
Size of the stored object: 508648 bytes
Size of the stored collection: 5086480 bytes
Used memory: 508648 bytes
Memory overhead: -4577832 bytes

[Done] exited with code=0 in 0.911 seconds

[Running] cd "c:\Users\hari2\Desktop\Code\Java\Main\src\" && javac PerformanceTest.java && java PerformanceTest
Size of the stored object: 511208 bytes
Size of the stored collection: 51120800 bytes
Used memory: 511208 bytes
Memory overhead: -50609592 bytes

[Done] exited with code=0 in 0.846 seconds

[Running] cd "c:\Users\hari2\Desktop\Code\Java\Main\src\" && javac PerformanceTest.java && java PerformanceTest
Size of the stored object: 537304 bytes
Size of the stored collection: 537304000 bytes
Used memory: 537304 bytes
Memory overhead: -536766696 bytes

[Done] exited with code=0 in 0.992 seconds

[Running] cd "c:\Users\hari2\Desktop\Code\Java\Main\src\" && javac PerformanceTest.java && java PerformanceTest
Size of the stored object: 804912 bytes
Size of the stored collection: 8049120000 bytes
Used memory: 804912 bytes
Memory overhead: -8048315088 bytes

[Done] exited with code=0 in 0.996 seconds
```

### Linkedlist

```
[Running] cd "c:\Users\hari2\Desktop\Code\Java\Main\src\" && javac PerformanceTest.java && java PerformanceTest
Size of the stored object: 509128 bytes
Size of the stored collection: 5091280 bytes
Used memory: 509128 bytes
Memory overhead: -4582152 bytes
```

```
[Done] exited with code=0 in 0.928 seconds
```

```
[Running] cd "c:\Users\hari2\Desktop\Code\Java\Main\src\" && javac PerformanceTest.java && java PerformanceTest
Size of the stored object: 513448 bytes
Size of the stored collection: 51344800 bytes
Used memory: 513448 bytes
Memory overhead: -50831352 bytes
```

```
[Done] exited with code=0 in 0.866 seconds
```

```
[Running] cd "c:\Users\hari2\Desktop\Code\Java\Main\src\" && javac PerformanceTest.java && java PerformanceTest
Size of the stored object: 556648 bytes
Size of the stored collection: 556648000 bytes
Used memory: 556648 bytes
Memory overhead: -556091352 bytes
```

```
[Done] exited with code=0 in 0.947 seconds
```

```
[Running] cd "c:\Users\hari2\Desktop\Code\Java\Main\src\" && javac PerformanceTest.java && java PerformanceTest
Size of the stored object: 988744 bytes
Size of the stored collection: 9887440000 bytes
Used memory: 988744 bytes
Memory overhead: -9886451256 bytes
```

```
[Done] exited with code=0 in 0.888 seconds
```

## Hashtable

```
[Done] exited with code=0 in 0.891 seconds
```

```
[Running] cd "c:\Users\hari2\Desktop\Code\Java\Main\src\" && javac PerformanceTest.java && java PerformanceTest
Size of the stored object: 509056 bytes
Size of the stored collection: 5090560 bytes
Used memory: 509056 bytes
Memory overhead: -4581504 bytes
```

```
[Done] exited with code=0 in 0.975 seconds
```

```
[Running] cd "c:\Users\hari2\Desktop\Code\Java\Main\src\" && javac PerformanceTest.java && java PerformanceTest
Size of the stored object: 514768 bytes
Size of the stored collection: 51476800 bytes
Used memory: 514768 bytes
Memory overhead: -50962032 bytes
```

```
[Done] exited with code=0 in 0.978 seconds
```

```
[Running] cd "c:\Users\hari2\Desktop\Code\Java\Main\src\" && javac PerformanceTest.java && java PerformanceTest
Size of the stored object: 584496 bytes
Size of the stored collection: 584496000 bytes
Used memory: 584496 bytes
Memory overhead: -583911504 bytes
```

```
[Done] exited with code=0 in 0.88 seconds
```

```
[Running] cd "c:\Users\hari2\Desktop\Code\Java\Main\src\" && javac PerformanceTest.java && java PerformanceTest
Size of the stored object: 1325936 bytes
Size of the stored collection: 13259360000 bytes
Used memory: 1325936 bytes
Memory overhead: -13258034064 bytes
```

```
[Done] exited with code=0 in 0.928 seconds
```

## HashMap

```

[Running] cd "c:\Users\hari2\Desktop\Code\Java\Main\src\" && javac PerformanceTest.java && java PerformanceTest
Size of the stored object: 509128 bytes
Size of the stored collection: 5091280 bytes
Used memory: 509128 bytes
Memory overhead: -4582152 bytes

[Done] exited with code=0 in 0.853 seconds

[Running] cd "c:\Users\hari2\Desktop\Code\Java\Main\src\" && javac PerformanceTest.java && java PerformanceTest
Size of the stored object: 515128 bytes
Size of the stored collection: 51512800 bytes
Used memory: 515128 bytes
Memory overhead: -50997672 bytes

[Done] exited with code=0 in 0.797 seconds

[Running] cd "c:\Users\hari2\Desktop\Code\Java\Main\src\" && javac PerformanceTest.java && java PerformanceTest
Size of the stored object: 586648 bytes
Size of the stored collection: 586648000 bytes
Used memory: 586648 bytes
Memory overhead: -586061352 bytes

[Done] exited with code=0 in 0.75 seconds

[Running] cd "c:\Users\hari2\Desktop\Code\Java\Main\src\" && javac PerformanceTest.java && java PerformanceTest
Size of the stored object: 1293072 bytes
Size of the stored collection: 12930720000 bytes
Used memory: 1293072 bytes
Memory overhead: -12929426928 bytes

[Done] exited with code=0 in 0.929 seconds

```

## Hashset

```

[Running] cd "c:\Users\hari2\Desktop\Code\Java\Main\src\" && javac PerformanceTest.java && java PerformanceTest
Size of the stored object: 509056 bytes
Size of the stored collection: 5090560 bytes
Used memory: 508928 bytes
Memory overhead: -4581632 bytes

[Done] exited with code=0 in 1.068 seconds

[Running] cd "c:\Users\hari2\Desktop\Code\Java\Main\src\" && javac PerformanceTest.java && java PerformanceTest
Size of the stored object: 515056 bytes
Size of the stored collection: 51505600 bytes
Used memory: 514928 bytes
Memory overhead: -50990672 bytes

[Done] exited with code=0 in 0.829 seconds

[Running] cd "c:\Users\hari2\Desktop\Code\Java\Main\src\" && javac PerformanceTest.java && java PerformanceTest
Size of the stored object: 572624 bytes
Size of the stored collection: 572624000 bytes
Used memory: 572496 bytes
Memory overhead: -572051504 bytes

[Done] exited with code=0 in 0.912 seconds

[Running] cd "c:\Users\hari2\Desktop\Code\Java\Main\src\" && javac PerformanceTest.java && java PerformanceTest
Size of the stored object: 1134344 bytes
Size of the stored collection: 11343440000 bytes
Used memory: 1134216 bytes
Memory overhead: -11342305784 bytes

[Done] exited with code=0 in 0.92 seconds

```

## Section 04

Collection Types	Number of Elements	Object Size (bytes)	Collection Size (bytes)	Used Memory (bytes)	Memory Overhead (bytes)
Arraylist	10	508648	5086480	508648	-4577832
	100	511208	51120800	511208	-50609592
	1000	537304	537304000	537304	-536766696
	10000	804912	8049120000	804912	-8048315088
Linkedlist	10	509128	5091280	509128	-4582152
	100	513448	51344800	513448	-50831352
	1000	556648	556648000	556648	-556091352
	10000	988744	9887440000	988744	-9886451256
Hashtable	10	509056	5090560	509056	-4581504
	100	514768	51476800	514768	-50962032
	1000	584496	584496000	584496	-583911504
	10000	1325936	13259360000	1325936	-13258034064
HashMap	10	509128	5091280	509128	-4582152
	100	515128	51512800	515128	-50997672
	1000	586648	586648000	586648	-586061352
	10000	1293072	12930720000	1293072	-12929426928
Hashset	10	509056	5090560	509056	-4581504

	100	515056	51505600	515056	-50990544
	1000	572624	572624000	572624	-572051376
	10000	1134344	11343440000	1134344	-11342305656

## Section 05

Array uses less memory overhead so it would be memory manageable collection type

Hash table use more amount of memory