# Sorting Data

## Sorting in Java

# By the end of this video you will be able to...

- Use pre-defined Java method to sort
- Explain the properties of the built-in sort

# Selection Sort: Basic Algorithm

For each **position `i`** from `0` to `length-2`

Find smallest element in "still unsorted"
Swap it to **position `i`**

# Insertion Sort: Basic Algorithm

For each **position `i`** from `1` to `length-1`

Find correct location of `i`th element relative to first `i-1`
Swap successive pairs to get there

```java
import java.util.*;

public class MyBuiltInSortingTest {

    public static void main (String[] args) {
        Random random = new Random();
        List<Integer> numsToSort = new ArrayList() ;

        for (int i=0; i < 5; i++) {
            numsToSort.add( random.nextInt(100) );
        }

        Collections.sort(numsToSort);
        System.out.println("New array after builtin sort: " +
                numsToSort.toString());

    }
}
```
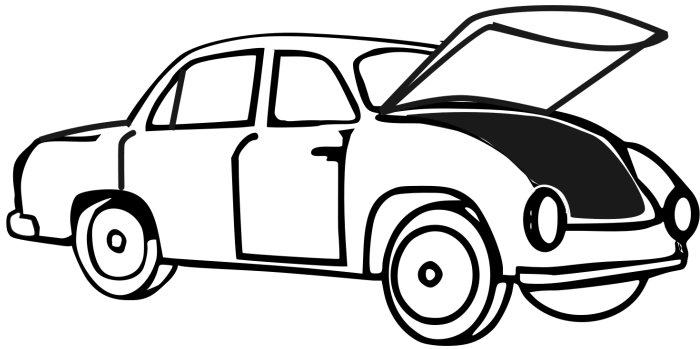
# Optimized merge sort

- Fast
  - in worst case
  - on nearly sorted data
- Stable