

CSSE 220

Merge Sort
Comparable/Comparator

Checkout *MergeSortSimple* project from SVN

Today's Plan

- Big-oh practice
- Merge sort
- How to use Java's sort functions (Comparable and Comparator)

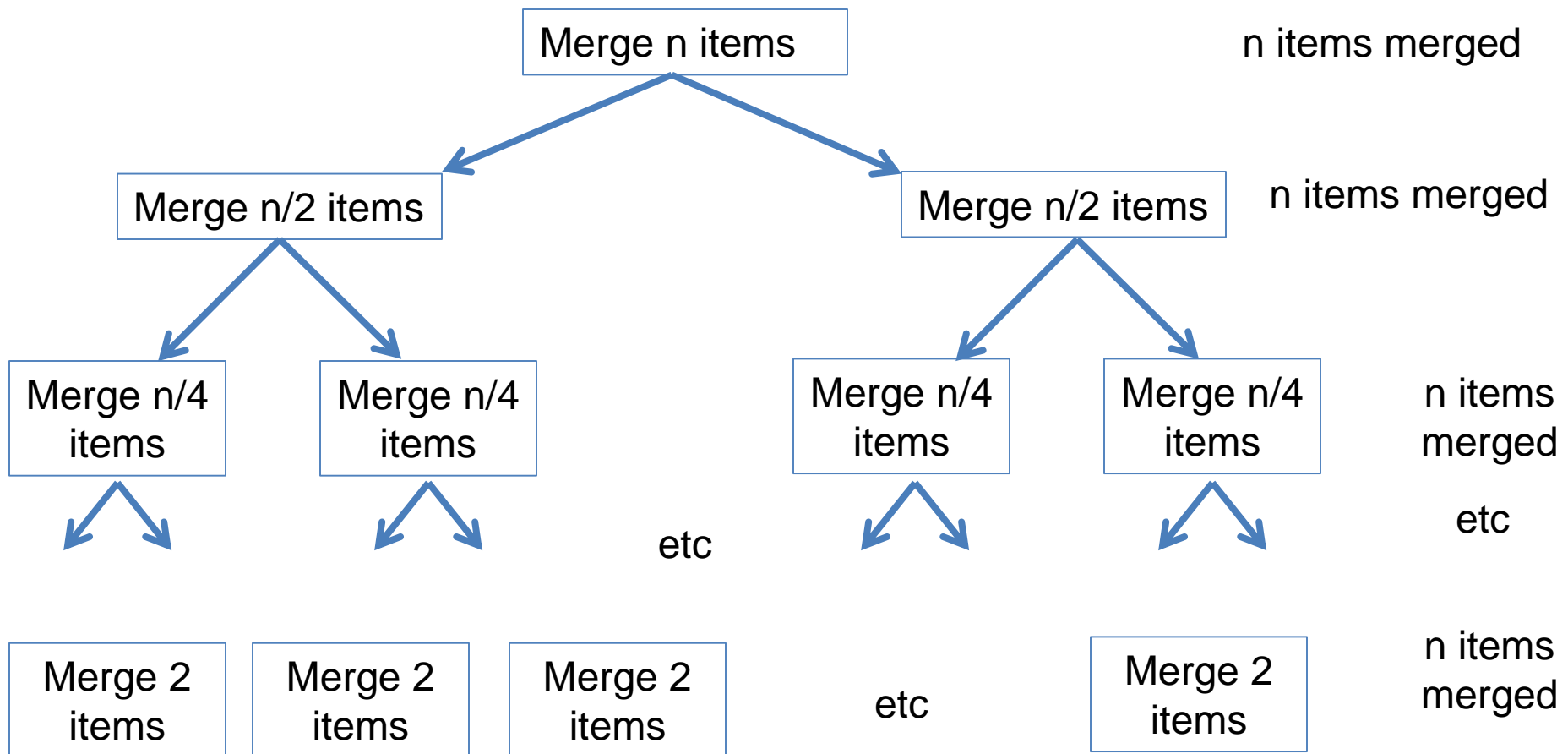
Merge Sort

- Basic recursive idea:
 - If list is length 0 or 1, then it's already sorted
 - Otherwise:
 - Divide list into two halves
 - Recursively sort the two halves
 - **Merge** the sorted halves back together

Analyzing Merge Sort

If list is length 0 or 1,
then it's already sorted

- Otherwise:
 - Divide list into two halves
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How to Sort in Java

- For arrays:

```
Arrays.sort(myArray);
```

- For ArrayLists or other stuff:

```
Collections.sort(myArrayList)
```

- For stuff like Strings and ints, the expected sorting is already built in. But what if you have a new class you want to sort?

When Your Object is Sortable

- You should implement the `Comparable<YourObjectType>` interface
- You need to implement 1 method: `compareTo`
- See section 10.3 of your text for details
- Let's do an example

A Sort of a Different Order

- Java libraries provide efficient sorting algorithms
 - `Arrays.sort(...)` and `Collections.sort(...)`
- But suppose we want to sort by something other than the “natural order” given by `compareTo()`
- *Function objects* to the rescue!

Function Objects

- Objects defined to just “wrap up” functions so we can pass them to other (library) code
- For sorting we can create a function object that implements [Comparator](#)
- Let's try it!