Sorting Algorithms

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Limitations of the computer.

It can only compare two values at a time.

Sorting Algorithms

Organized and sorted data is much more efficient to work with.

- Search for specific values
- Identify features such as duplicates
- Compare data

Sorting Algorithms

Conceptually simple to understand

The end goal is clear

Introduce algorithms and nested loops

BubbleSort

BubbleSort

```
for i = 0 to size-1 do:
  for j = 0 to size-1 do:
    if list[j] > list[j+1] then
      swap( list[j], list[j+1] )
    end if
  end for
end for
```

How to Swap List entries

If we try to swap entries at position `i` and position `j` by assigning the value of the one at `i` to be the value at `j`, we lose the value at `i`.

We need a temporary variable that stores the value at `i`.

In application it looks like this:

```
int temp = list.get(i);

list.set(i, list.get(j));

list.set(j, temp);
```

BubbleSort

Visual Demo

https://visualgo.net/en/sorting

BubbleSort Project

With the remaining time, go to Chrispier.github.io and download the project code.

Implement the BubbleSort Algorithm for an ArrayList.