James Tessitore HeapSortNotes

* Heap Sort
	+ Considered BigO(log2N)
	+ Each heap starts with a root, and then branches off into two elements, which also branch off into two elements and so on.
	+ Sorts a heap by:
		- Take root element off the heap, and put it in its place
		- Reheap the remaining elements (put next largest element in loop position)
		- Repeat until there are no more elements
	+ Assume there are no duplicate values
	+ Two Types:
		- Min heap
			* value in location n is < than either of its children
		- Max heap
			* value in location n is > than either of its children
	+ **To sort a min heap**

Array of values

Index: 1 2 3 4 5

Value: 3

 3

Index: 1 2 3 4 5

Value: 3 2

 3 2

 2 Compare 2 and 3 - Switch 3

Index: 1 2 3 4 5

Value: 2 3 -1

 2 -1

 3 -1 Compare 2 and -1 - Switch 3 2

Index: 1 2 3 4 5

Value: -1 3 2 10

 -1

 3 2

 10 Compare 10 and 3 - No Switch

Index: 1 2 3 4 5

Value: -1 3 2 10 6

 -1

 3 2

 10 6 Compare 6 and 3 – No Switch

* + **To sort a max heap**

Index: 1 2 3 4 5

Value: 10

 10

Index: 1 2 3 4 5

Value: 10 12

 10 12

 12 Compare and 10 and 12 – Switch 10

Index: 1 2 3 4 5

Value: 12 10 -5

12

 10 -5 Compare -5 and 12 – No switch

Index: 1 2 3 4 5

Value: 12 10 -5 20

 12 12 20

 10 -5 20 -5 12 -5

20 Compare 20 and 10 – Switch 10 Compare 20 and 12 – Switch 10

Index: 1 2 3 4 5

Value: 20 12 -5 10 15

 20 20

 12 -5 15 -5

 10 15 Compare 15 and 12 – Switch 10 12

Index: 1 2 3 4 5

Value: 20 15 -5 10 12