Tutorial 8

The goal of this tutorial is to reinforce the following material:

- Arrays that are not INT
- Sorting Stepping

Non-Integer Arrays

Arrays can be applied to almost any data type. Today we will be investigating its usage with structs.

The POSN structure

```
struct posn{
  double x;
  double y;
};
```

POSN Suite

Implement the following functions:

```
//See interface on Seashell for Documentation

void scalar_multiple
                (struct posn posns[], int len, double x);

void swap(struct posn posns[], int len);

struct posn colapse(struct posn posns[], int len);
```

Sorting Stepping

- Selection Sort
- Insertion Sort
- Quick Sort

Selection Sort

In Selection Sort, the smallest element is *selected* to be the first element in the new sorted sequence, and then the next smallest element is selected to be the second element, and so on.

See Seashell for code.

Insertion Sort

In Inseriton Sort, we consider the first element to be a sorted sequence of length one.

We then “insert” the second element into the existing sequence into the correct position, and so on.

See Seashell for code.

Quicksort

Quicksort is an example of a “divide & conquer” algorithm.

First, an element is selected as a “pivot” element.

The list is then **partioned** (*divided*) into two sub-groups: elements *less than* (or equal to) the pivot and those *greater than* the pivot.

Finally, each sub-group is then sorted (*conquered*).

See Seashell for code.