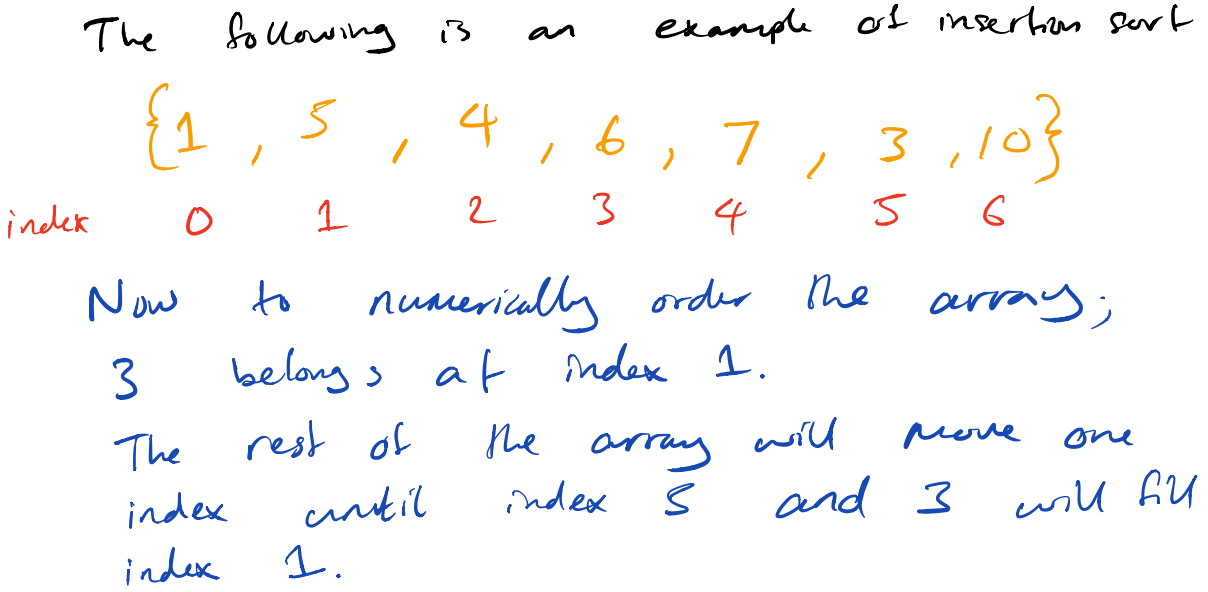
Algorithms Lecture 1

- An algorithm is a well defined computational procedure which takes a set of inputs and produces a set of outputs. Thus, an algorithm is a computational procedure which transforms an input into an output.
- An algorithm can sort a family of inputs.



Each time you put something in place, everything to it's left is already sorted.

- Correctness, efficiency and simplicity is looked at when determining an algorithm, but simplicity can be sacrificed.
- Complexity of an algorithm is its space (in memory)and time cost.
- To measure time cost, you measure certain operations. This is due to machines having different speeds.
- Interested on the size of the input and how long it takes. whats taken to consideration is a very big input size, and how well it performs. Some algorithms perform very good with small inputs but not so well with big inputs.
- Need to know the worse case
    - At times the worse case is double the average and times it is many folds more.
- Complexity will determine how efficient an algorithm is. You will use the asymptotic efficiency of algorithms.
- Using the big O notation
- Selection and insertion sort are both O(n^2).
- A problem is called tractable if there is an efficient algorithm that solves it.
- Intractable if no efficient way.
- Naive algorithm- trying all different ways. Not efficient.
- Intractable is useful for security. As difficult to solve.
- Some problems are not able to solve