

There are three basic algorithms you need to be familiar with for the APCSA curriculum. You are not required to code them, and only need to understand how they work:

- SelectionSort
- InsertionSort
- MergeSort

You can see the following for algorithms and running time:

<https://www.toptal.com/developers/sorting-algorithms>

It is probably a good idea to watch the following videos and get an idea of what sort of operations the algorithms perform on integers in an array. Amusing as they may be, they present the conceptual aspect of the movement of data by each algorithm in a very clear way.

Selection Sort Dance:

<https://www.youtube.com/watch?v=Ns4TPTC8whw>

Insertion Sort Dance:

<https://www.youtube.com/watch?v=ROaIU379I3U>

Merge Sort Dance:

https://www.youtube.com/watch?v=XaqR3G_NVoo

Algorithms have an efficiency or *running time* expressed using **Big-O Notation**.

$O(1)$ is a statement call.

$O(n)$ is a loop.

$O(n^2)$ would be a loop inside of another loop.

Efficient algorithms can run at $O(n \cdot \log(n))$ efficiency on average, whereas inefficient ones tend to be $O(n^2)$ for their average, worst, and best cases!