Quadratic Probing

Want to avoid primary clustering.

If our spot is full, let's try to move far away relatively quickly.

h(key) % TableSize full?

Try (h(key) + 1) % TableSize.

Also full? (h(key) + 4) % TableSize.

Also full? (h(key) + 9) % TableSize.

Also full? (h(key) + 16) % TableSize.

…

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Insertion Sort Analysis

Stable? Yes! (If you're careful)

In Place Yes!

Running time:

- What's the best case and worst case?

```
for(i from 1 to n-1){
     int index = i
     while(a[index-1] > a[index]){
          swap(a[index-1], a[index])
          index = index-1
     }
}
```

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_____ Sort

Here's another idea for a sorting algorithm:

Maintain a sorted subarray

While(subarray is not full array)

- Find the smallest element remaining in the unsorted part.
- Insert it at the end of the sorted part.

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Merge Sort Pseudocode

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

```
mergeSort(input) {
   if (input.length == 1)
      return
   else
      smallerHalf = mergeSort(new [0, ..., mid])
      largerHalf = mergeSort(new [mid + 1, ...])
      return merge(smallerHalf, largerHalf)
}
```

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