Computer Science 7

Searching Algorithms

1. Algorithm: a set of instructions which the computer performs to accomplish whatever task you want.
2. Searching data
   1. If we had 100,000 names and wished to find one person, we could start at the beginning and look at every name until we found who we were looking for. Very slow. This is called a linear search.
      1. For example, suppose a supermarket has 10,000 different products on its shelves. When a bar code is scanned at a checkout, the computer must look through up to 10,000 numbers to find the product name and price. Even if it takes only one thousandth of a second to check each code, ten seconds would be needed to go through the whole list. Imagine how long it would take to check out the groceries for a family!
   2. Computer scientists and mathematicians have created techniques to find information quickly.
      1. If we didn’t have these techniques, we probably would not have an internet as you know it.
3. Search key
4. array
5. Binary search
   1. The numbers are sorted into order. Checking the middle item of the list will identify which half the search key is in
   2. Returning to the supermarket example, the 10,000 items can now be searched with fourteen probes, which might take two hundredths of a second—hardly noticeable.
   3. Use video: binary searches
6. Hashing