How do we solve problems recursively?

What if you knew that the list you were searching through was sorted and you looked at the 500,000 element first?

There are three options:

1. The 500,000 element is *key.*
   Success! You found what you are looking for, have a cookie.

2. The 500,000 element is larger than *key.*
   This means that *key* does not appear after element 500,000.

3. The 500,000 element is smaller than *key.*
   This means that *key* does not appear before element 500,000.

How useful is this information?

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