

SEARCH

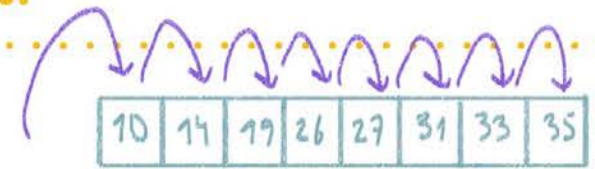


Let's say you are reading a very thick book over 100 pages. You just turned page 64 and then your book slipped, fell on the floor and closed! Now you need to find page 64 to continue reading it.

There are several ways to do it:

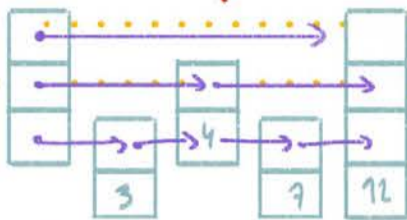
Linear Search:

1. Open the book on page one
2. Turn one page at a time, until you find page 64



How many turns would you need to find page 64?

(It's a tricky question because you can see two pages at a time)



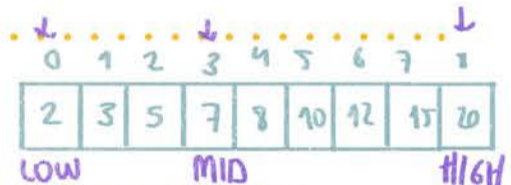
Skip Search:

1. Open the book somewhere in the beginning
2. Turn several pages at a time, until you find page 64. If you run over, go back

If each time you turn 10 pages, how many turns would you need?

Binary Search or Divide-and-conquer Search:

1. Open the book somewhere in the middle
2. If the page you are looking for is smaller, open the book in the middle of what's on the left
3. If the page you are looking for is larger, open the book in the middle of what's on the right
4. Continue "narrowing down" your search until you find your page



The search is called divide-and-conquer, because every time, you divide your search in two, so you need to look only at half of the pages.

How many turns do you need to make to find page 64?
Why not try several times and experiment?

2 ? 8 ? Guess A Number Game ? 1 ? 5 ?

You can use "divide-and-conquer" search in "guess-a-number" game: Think of a number (from 1 to 100 or from 1 to 1000) and when the other person tries to guess it, say "Correct" (if guessed correctly).

"Bigger" (if your number is bigger) or

"Smaller" (if your number is smaller)