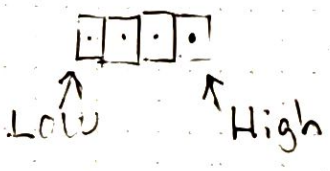
Introduction to algorithms

Binary search

Conditions
- Sorted lists/arrays

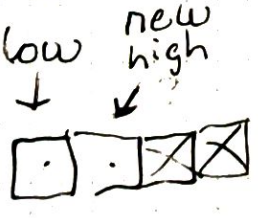



```
Low = 0
high = len(list) - 1
```

The binary search function takes a sorted array and an item. If the item is in the array, the function returns the item.

each time you check the middle element.

```
mid = (low + high) // 2
guess = list[mid]
if guess is too low:
if guess < item:
  Low = mid + 1
```



if guess is too high:

```
def binary_search(list, item):
low = 0
high = len(list) -1

 while low <= high:
    mid = (low + high) / 2
    guess = list[mid]
    if guess == item:
       return mid
    if guess > item:
      high = mid -1
    else:
       low = mid +1
    return None
```

Recap

Binary search

- takes a sorted list or array
- Let's take 100

- Starts by searching in the middle element.

100 → 50 → 25 → 12 → 6 → 3 → 2 → 1

This way it eliminates half of the existing numbers each time.