# quick sort

May 26, 2021

[1]:

```python
def partition(array, start, end):
    pivot = array[start]
    low = start + 1
    high = end

    while True:

        while low <= high and array[high] >= pivot:
            high = high - 1

        # Opposite process of the one above
        while low <= high and array[low] <= pivot:
            low = low + 1

        # We either found a value for both high and low that is out of order
        # or low is higher than high, in which case we exit the loop
        if low <= high:
            array[low], array[high] = array[high], array[low]
            # The loop continues
        else:
            # We exit out of the loop
            break

    array[start], array[high] = array[high], array[start]

    return high
```

[2]:

```python
def quick_sort(array, start, end):
    if start >= end:
        return

    p = partition(array, start, end)
    quick_sort(array, start, p-1)
    quick_sort(array, p+1, end)
```

[3]:

```python
array = [29,99,27,41,66,28,44,78,87,19,31,76,58,88,83,97,12,21,44]

quick_sort(array, 0, len(array) - 1)
```

```
print(array)
```

```
[12, 19, 21, 27, 28, 29, 31, 41, 44, 44, 58, 66, 76, 78, 83, 87, 88, 97, 99]
```

[ ]:

```

```