Quicksort:

1. Using the first number in each (sub)array as a pivot, quicksort the following array:

$$A = \{6, 3, 5, 2, 7, 1, 9\}$$

2. Based on the example above, are some pivots better than others?

3. Can quicksort be implemented in-place? Why or why not?

4. Pretend we have a function called `partition(A, low, hi)` that returns the index where the pivot should go in the subarray from `A[low:hi]` (inclusive). The pivot should begin at `A[low]`. Fill in the following method (pseudocode):

```
def quicksort(A, low, hi):


    _____ = partition(            )

    quicksort(             )

    quicksort(             )
```

5. Now write pseudocode for `partition`, our helper method. What is the return type?

```
def partition(A, low, hi):
```

6. What is the runtime of quicksort, in terms of the array length n?