**Problem 1**

QuickSort ([1, 6, 2, 4, 3, 5])

E = 1;

L = [];

G = [6, 2, 4, 3, 5];

QuickSort([]);

QuickSort([6, 2, 4, 3, 5]);

E = 6;

L = [2, 4, 3, 5];

G = [];

QuickSort([]);

QuickSort([2, 4, 3, 5]);

E = 2;

L = [];

G = [4, 3, 5];

QuickSort([]);

QuickSort([4, 3, 5]);

E = 4;

L = [3];

G = [5];

QuickSort([3]);

QuickSort([5]);

Return [3, 4, 5];

Return [2, 3, 4, 5];

Return [2, 3, 4, 5, 6];

Return [1, 2, 3, 4, 5, 6];

**Problem 2**

1. Good pivot: 2, 3, 3, 4, 5
2. Yes. 5/9 elements of A are good pivot

**Problem 4**

* QuickSelect algorithm (with worst case running time O(n)) to select pivots each time.
* Using this algorithm guarantees that all pivots are good pivots:
  + The recursion tree has height O(log n).

=> Running time is O(n log n) in the worst case.