2.5

1. If pivot is i=2 (1 indexed) then a recurrance relation would split into 1st index and then the rest of the numbers in another

second smallest element

Range pivot position but still bad though

$$T(n) = T(n-2) + n$$
$$= T(n-4) + 2n - 2$$
$$= T(n-6) + 3n - 6$$
$$= \frac{n(n-2)}{2} = n^2$$

Overall if the pivot is in location 2 then the quicksort will have array size 1 and n-2 so the recurrance relation would solve to $O(n^2)$. That means it has $O(n^2)$ behavior

2. In this case, the pivot selection would be poor and the algorithm may be supper. In the first case where each half contains 1/3 the algorithms will be poor partition: $O(n^2)$. In case number 2 as 2/3 and 2/3 on each side of the array where most of the array is sorted it would be slightly better but probably not ideal $n \log n$ but somewhere in between. Overall the algorithm should fall between $O(n \log n)$ and $O(n^2)$