Week 4 In-Class

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1 Question 2

The liklihood of an element being selected as the pivot point is part of the analysis because how the array is partitioned affects the running time. If there is at least one element on the other side of the pivot, the running time is $\Theta(n \lg n)$, but if one sub-array is empty, the running time is $\Theta(n^2)$. So, in the analysis we need to consider the liklihood that p is either the largest or smallest element of A. In an array of size n, the liklihood of selecting element i is $\frac{1}{n}$.

2 Question 4

If we left X_i be the event that person i received the correct hat, then

$$Pr\{X_i = 1\} = \frac{1}{n}$$

$$E(X) = \sum_{i=1}^{n} \frac{1}{n} = n \times \frac{1}{n} = 1$$