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# Assignment #1

## Comparisons:

| | | Randomized Divide-Conquer | | | | Deterministic Selection | | | | Naïve Solution | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tests | Array Size | Run1 | Run2 | Run3 | Avg | Run1 | Run2 | Run3 | Avg | Run1 | Run2 | Run3 | Avg |
| test1 | 1000 | 0 | 1 | 1 | 0.66667 | 2 | 1 | 0 | 1 | 3 | 3 | 3 | 3 |
| test2 | 10,000 | 4 | 3 | 4 | 3.66667 | 6 | 5 | 5 | 5.33333 | 10 | 11 | 12 | 11 |
| test3 | 100,000 | 10 | 10 | 13 | 11 | 18 | 15 | 21 | 18 | 47 | 43 | 36 | 42 |
| test4 | 1,000,000 | 75 | 84 | 62 | 73.6667 | 57 | 56 | 74 | 62.3333 | 360 | 342 | 350 | 350.667 |
| test5 | 1,000,000 | 68 | 39 | 56 | 54.3333 | 74 | 88 | 81 | 81 | 384 | 354 | 353 | 363.667 |
| test6 | 10,000,000 | 349 | 383 | 356 | 362.667 | 475 | 633 | 577 | 561.667 | 4530 | 4572 | 4548 | 4550 |
| test7 | 10,000,000 | 555 | 393 | 281 | 409.667 | 593 | 544 | 497 | 544.667 | 4737 | 4541 | 4672 | 4650 |

## Observation:

1. Naïve solution is so bad compared to the other two Algorithms.
2. Randomized Divide-Conquer is better than Deterministic Selection in many cases.
3. Randomized Divide-Conquer Runs vary from each other. That means that it's not a consistent algorithm.
4. It's good to have a solution like Deterministic Selection, although Randomized Divide-Conquer runs faster than him in many cases, but Deterministic Selection gives as a deterministic run time not an expected one.