COSC 581 Algorithms Code Assignment #1

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Due: Tuesday, February 27, 2024

Compiling and Running

To compile the code, run the following commands. This will create an executable in the *target/release* directory called *sort*. Copy this to your current directory to use it conveniently.

```
cargo build --release
cp target/release/sort .
```

To run the code on an unsorted text file, run the following command:

```
./sort unsorted-list.txt > sorted-list.txt
```

Behavior

I found that, for a million elements, a cutoff of anywhere between 100-200 (falling back to insertion sort on arrays of 100-200 elements) yielded the lowest runtime for sorting.

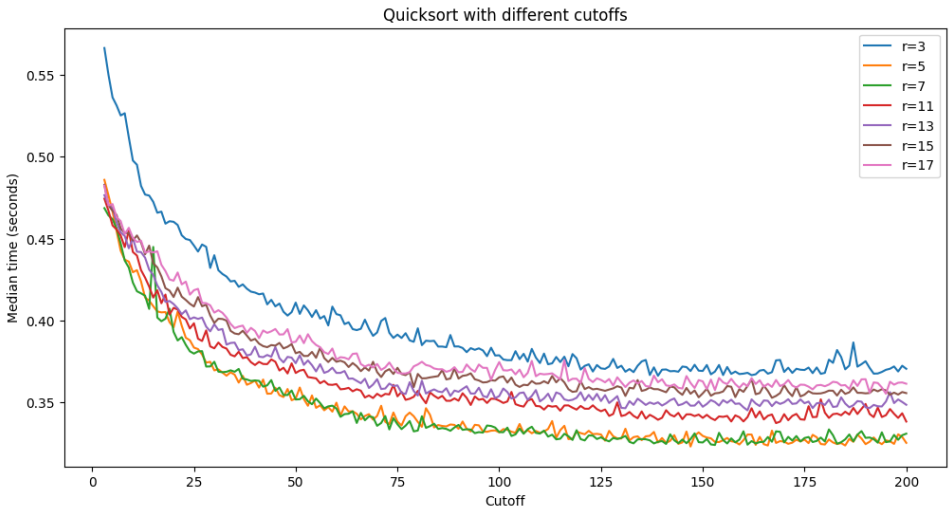

Figure 1: Runtime with different cutoffs

I also found that, the performance is optimal with subarray sizes of 5 and 7. The runtime is the worst with a subarray size of 3. After 7, the runtime increases again and gradually becomes worse.

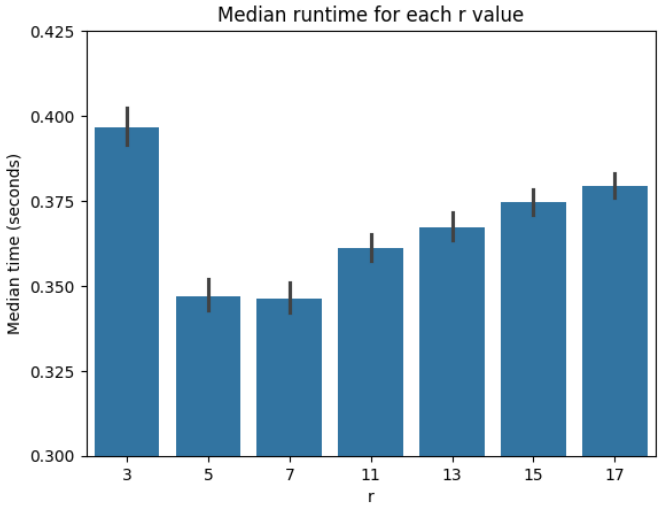

Figure 2: Runtime with different r values (subarray size)