**Kweku Ofori**

**Lab6 Report**

For cases with runtimes exceeding 10 minutes, I assigned a large runtime of 5E6 to indicate how long it takes due it’s inefficiency and most importantly to aid in helping me construct my graphs.

I marked cases \*\*error\*\* to indicate StackOverflow errors from the runtime meaning the program was not suitable for that test case.

I have attached Label graphs and charts for the respective cases and screenshots for the test cases I run.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Array a |  |  |  |  |  |  |  |
| Sort | 1Kints | 2Kints | 4Kints | 8Kints | 16Kints | 32Kints | 1Mints |
| Arrays.sort() | 1 | 0 | 2 | 1 | 3 | 3 | 89 |
| Bubble Sort | 6 | 14 | 28 | 103 | 497 | 2003 | 5000000 |
| Selection Sort | 4 | 11 | 21 | 63 | 158 | 684 | 1368801 |
| Insertion Sort | 3 | 10 | 10 | 15 | 39 | 97 | 101672 |
| Merge Sort | 2 | 2 | 3 | 7 | 9 | 17 | 333 |
| Quick Sort | 1 | 0 | 1 | 2 | 4 | 14 | 120 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Array b |  |  |  |  |  |  |  |
| Sort | 1Kints | 2Kints | 4Kints | 8Kints | 16Kints | 32Kints | 1Mints |
| Arrays.sort() | 0 | 0 | 0 | 0 | 1 | 1 | 20 |
| Bubble Sort | 1 | 6 | 17 | 54 | 206 | 629 | 5000000 |
| Selection Sort | 1 | 3 | 13 | 44 | 168 | 609 | 199507 |
| Insertion Sort | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Merge Sort | 1 | 1 | 1 | 3 | 4 | 9 | 156 |
| Quick Sort | 3 | 3 | 10 | 89 | 210 | \*\*error\*\* | \*\*error\*\* |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Array c |  |  |  |  |  |  |  |
| Sort | 1Kints | 2Kints | 4Kints | 8Kints | 16Kints | 32Kints | 1Mints |
| Arrays.sort() | 0 | 0 | 0 | 0 | 0 | 2 | 48 |
| Bubble Sort | 2 | 6 | 10 | 38 | 158 | 752 | 5000000 |
| Selection Sort | 1 | 1 | 10 | 25 | 107 | 436 | 387075 |
| Insertion Sort | 0 | 2 | 14 | 27 | 68 | 330 | 214464 |
| Merge Sort | 1 | 1 | 1 | 2 | 2 | 6 | 195 |
| Quick Sort | 5 | 2 | 9 | 53 | 118 | \*\*error\*\* | \*\*error\*\* |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Array d |  |  |  |  |  |  |  |
| Sort | 1Kints | 2Kints | 4Kints | 8Kints | 16Kints | 32Kints | 1Mints |
| Arrays.sort() | 0 | 1 | 1 | 1 | 2 | 4 | 46 |
| Bubble Sort | 0 | 3 | 5 | 25 | 110 | 468 | 5000000 |
| Selection Sort | 0 | 1 | 6 | 15 | 54 | 295 | 201325 |
| Insertion Sort | 0 | 0 | 0 | 3 | 7 | 41 | 27885 |
| Merge Sort | 0 | 1 | 1 | 2 | 4 | 6 | 237 |
| Quick Sort | 0 | 0 | 1 | 1 | 1 | \*\*error\*\* | \*\*error\*\* |















