Cairo University

**Data Structures**

Assignment 1

Sorting Algorithms & Time Complexity

Under supervision of: Dr Bashir

Team Members

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The Algorithms Times & Plots

|  |  |
| --- | --- |
| **Size** | Shell Sort |
| 200 | 19 |
| 500 | 64 |
| 1000 | 162 |
| 5000 | 1113 |
| 10000 | 2819 |
| 20000 | 3755 |
| 50000 | 12155 |
| 100000 | 27621 |

1. Shell Sort
2. Count Sort

|  |  |
| --- | --- |
| Size | Count Sort |
| 200 | 5659 |
| 500 | 6049 |
| 1000 | 12376 |
| 5000 | 9715 |
| 10000 | 8874 |
| 20000 | 13410 |
| 50000 | 14518 |
| 100000 | 14142 |

1. Quick Sort

|  |  |
| --- | --- |
| Size | quick\_sort |
| 200 | 19 |
| 500 | 50 |
| 1000 | 111 |
| 5000 | 646 |
| 10000 | 1259 |
| 20000 | 2894 |
| 50000 | 7071 |
| 100000 | 14052 |

1. Selection Sort

|  |  |
| --- | --- |
| Size | Selection\_sort |
| 200 | 55 |
| 500 | 394 |
| 1000 | 1122 |
| 5000 | 26659 |
| 10000 | 105966 |
| 20000 | 400164 |
| 50000 | 2.44E+06 |
| 100000 | 9.82E+06 |

1. Insertion Sort

|  |  |
| --- | --- |
| Size | Insertion\_sort |
| 200 | 24 |
| 500 | 145 |
| 1000 | 599 |
| 5000 | 13258 |
| 10000 | 52009 |
| 20000 | 213415 |
| 50000 | 1.26E+06 |
| 100000 | 5.07E+06 |

1. Bubble Sort

|  |  |
| --- | --- |
| Size | Bubble\_sort |
| 200 | 148 |
| 500 | 669 |
| 1000 | 2430 |
| 5000 | 53873 |
| 10000 | 248895 |
| 20000 | 1.13E+06 |
| 50000 | 7.51E+06 |
| 100000 | 3.12E+07 |

1. Merge Sort

|  |  |
| --- | --- |
| Size | Merge\_sort |
| 200 | 160 |
| 500 | 149 |
| 1000 | 433 |
| 5000 | 1309 |
| 10000 | 2501 |
| 20000 | 5725 |
| 50000 | 13544 |
| 100000 | 31211 |

All Sortings