**Tests**

Below I have the results from sorting the various datasets.

**Sorting random array**

Selection Sort

|  |  |
| --- | --- |
| **Number of integers** | **Time** |
| 10 | 0 seconds |
| 100 | 0 seconds |
| 1,000 | 0 seconds |
| 10,000 | 0.140625 seconds |
| 100,000 | 19.765625 seconds |
| 1,000,000 | >28 mins |

Radix Sort

|  |  |
| --- | --- |
| **Number of integers** | **Time** |
| 10 | 0 seconds |
| 100 | 0 seconds |
| 1,000 | 0 seconds |
| 10,000 | 0 seconds |
| 100,000 | 0.015625 seconds |
| 1,000,000 | 0.125000 seconds |
| 2,000,000 | 0.218750 seconds |
| 3,000,000 | 0.312500 seconds |
| 5,000,000 | 0.593750 seconds |

Quick sort

|  |  |
| --- | --- |
| **Number of integers** | **Time** |
| 10 | 0 seconds |
| 100 | 0 seconds |
| 1,000 | 0 seconds |
| 10,000 | 0 seconds |
| 100,000 | 0.390625 seconds |
| 1,000,000 | 41.218750 seconds |
| 2,000,000 | 168.859375 seconds |
| 3,000,000 | 365.781250 seconds |
| 5,000,000 | 1002.656250 seconds |

**Sorting an array first half ascending, second descending**

Selection Sort

|  |  |
| --- | --- |
| **Number of integers** | **Time** |
| 10 | 0 seconds |
| 100 | 0 seconds |
| 1,000 | 0.015625 seconds |
| 10,000 | 0.156250 seconds |
| 100,000 | 15.046875 seconds |

Radix Sort

|  |  |
| --- | --- |
| **Number of integers** | **Time** |
| 10 | 0 seconds |
| 100 | 0 seconds |
| 1,000 | 0 seconds |
| 10,000 | 0 seconds |
| 100,000 | 0.015625 seconds |

Quick sort

|  |  |
| --- | --- |
| **Number of integers** | **Time** |
| 10 | 0 seconds |
| 100 | 0 seconds |
| 1,000 | 0 seconds |
| 10,000 | 0.046875 seconds |
| 100,000 | 3.656250 seconds |

**Sorting a reverse sorted array**

Selection Sort

|  |  |
| --- | --- |
| **Number of integers** | **Time** |
| 10 | 0 seconds |
| 100 | 0 seconds |
| 1,000 | 0.015625 seconds |
| 10,000 | 0.140625 seconds |
| 100,000 | 14.703125 seconds |
| 1,000,000 | >25 mins |

Radix Sort

|  |  |
| --- | --- |
| **Number of integers** | **Time** |
| 10 | 0 seconds |
| 100 | 0 seconds |
| 1,000 | 0 seconds |
| 10,000 | 0 seconds |
| 100,000 | 0.015625 seconds |
| 1,000,000 | 0.125000 seconds |
| 2,000,000 | 0.359375 seconds |
| 3,000,000 | 0.562500 seconds |
| 5,000,000 | 0.593750 seconds |

Quick sort

|  |  |
| --- | --- |
| **Number of integers** | **Time** |
| 10 | 0 seconds |
| 100 | 0 seconds |
| 1,000 | 0 seconds |
| 10,000 | 0.078125 seconds |
| 100,000 | 15.859375 seconds |
| 1,000,000 | 273.375 seconds |

**Sorting an already sorted array**

Selection Sort

|  |  |
| --- | --- |
| **Number of integers** | **Time** |
| 10 | 0 seconds |
| 100 | 0 seconds |
| 1,000 | 0 seconds |
| 10,000 | 0.140625 seconds |
| 100,000 | 14.703125 seconds |

Radix Sort

|  |  |
| --- | --- |
| **Number of integers** | **Time** |
| 10 | 0 seconds |
| 100 | 0 seconds |
| 1,000 | 0 seconds |
| 10,000 | 0 seconds |
| 100,000 | 0.031250  seconds |
| 1,000,000 | 0.109375 seconds |
| 2,000,000 | 0.281250 seconds |
| 3,000,000 | 0.375000 seconds |
| 5,000,000 | 0.609375 seconds |

Quick sort

|  |  |
| --- | --- |
| **Number of integers** | **Time** |
| 10 | 0 seconds |
| 100 | 0 seconds |
| 1,000 | 0 seconds |
| 10,000 | 0.109375 seconds |
| 100,000 | 39.625000 seconds |
| 1,000,000 | >25 minutes |

**Sorting a half-sorted array**

Selection Sort

|  |  |
| --- | --- |
| **Number of integers** | **Time** |
| 10 | 0 seconds |
| 100 | 0 seconds |
| 1,000 | 0.015625 seconds |
| 10,000 | 0.140625 seconds |
| 100,000 | 15.796875 seconds |
| 1,000,000 | >20 mins |

Radix Sort

|  |  |
| --- | --- |
| **Number of integers** | **Time** |
| 10 | 0 seconds |
| 100 | 0 seconds |
| 1,000 | 0 seconds |
| 10,000 | 0 seconds |
| 100,000 | 0.015625  seconds |
| 1,000,000 | 0.109375 seconds |
| 2,000,000 | 0.234375  seconds |
| 3,000,000 | 0.343750 seconds |
| 5,000,000 | 0.578125  seconds |

Quick sort

|  |  |
| --- | --- |
| **Number of integers** | **Time** |
| 10 | 0 seconds |
| 100 | 0 seconds |
| 1,000 | 0.015625  seconds |
| 10,000 | 0.015625  seconds |
| 100,000 | 0.437500 seconds |
| 1,000,000 | 40.109375 seconds |
| 2,000,000 | 157.328125 seconds |
| 3,000,000 | 364.296875 seconds |
| 5,000,000 | 1026.031250 seconds |