Shammah Thao

Csc20-11

Final Exam part 1

* Highlights are for the number that are switching with each other.

1.

Bubble Sort:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 54 | 25 | 93 | 17 | 77 | 31 | 44 | 55 | 22 |
| 25 | 54 | 93 | 17 | 77 | 31 | 44 | 55 | 22 |
| 25 | 54 | 93 | 17 | 77 | 31 | 44 | 55 | 22 |
| 25 | 54 | 17 | 93 | 77 | 31 | 44 | 55 | 22 |
| 25 | 54 | 17 | 77 | 93 | 31 | 44 | 55 | 22 |
| 25 | 54 | 17 | 77 | 31 | 93 | 44 | 55 | 22 |
| 25 | 54 | 17 | 77 | 31 | 44 | 93 | 55 | 22 |
| 25 | 54 | 17 | 77 | 31 | 44 | 55 | 93 | 22 |
| 25 | 54 | 17 | 77 | 31 | 44 | 55 | 22 | 93 |
| 25 | 54 | 17 | 77 | 31 | 44 | 55 | 22 | 93 |
| 25 | 17 | 54 | 77 | 31 | 44 | 55 | 22 | 93 |
| 25 | 17 | 54 | 31 | 77 | 44 | 55 | 22 | 93 |
| 25 | 17 | 54 | 31 | 44 | 77 | 55 | 22 | 93 |
| 25 | 17 | 54 | 31 | 44 | 55 | 77 | 22 | 93 |
| 25 | 17 | 54 | 31 | 44 | 55 | 22 | 77 | 93 |
| 17 | 25 | 54 | 31 | 44 | 55 | 22 | 77 | 93 |
| 17 | 25 | 31 | 54 | 44 | 55 | 22 | 77 | 93 |
| 17 | 25 | 31 | 44 | 54 | 55 | 22 | 77 | 93 |
| 17 | 25 | 31 | 44 | 54 | 22 | 55 | 77 | 93 |
| 17 | 25 | 31 | 44 | 22 | 54 | 55 | 77 | 93 |
| 17 | 25 | 31 | 22 | 44 | 54 | 55 | 77 | 93 |
| 17 | 25 | 22 | 31 | 44 | 54 | 55 | 77 | 93 |
| 17 | 25 | 22 | 31 | 44 | 54 | 55 | 77 | 93 |
| 17 | 22 | 25 | 31 | 44 | 54 | 55 | 77 | 93 |

Selection Sort:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 54 | 25 | 93 | 17 | 77 | 31 | 44 | 55 | 22 |
| 54 | 25 | 22 | 17 | 77 | 31 | 44 | 55 | 93 |
| 54 | 25 | 22 | 17 | 77 | 31 | 44 | 55 | 93 |
| 54 | 25 | 22 | 17 | 55 | 31 | 44 | 77 | 93 |
| 54 | 25 | 22 | 17 | 55 | 31 | 44 | 77 | 93 |
| 54 | 25 | 22 | 17 | 44 | 31 | 55 | 77 | 93 |
| 54 | 25 | 22 | 17 | 44 | 31 | 55 | 77 | 93 |
| 31 | 25 | 22 | 17 | 44 | 54 | 55 | 77 | 93 |
| 31 | 25 | 22 | 17 | 44 | 54 | 55 | 77 | 93 |
| 31 | 25 | 22 | 17 | 44 | 54 | 55 | 77 | 93 |
| 17 | 25 | 22 | 31 | 44 | 54 | 55 | 77 | 93 |
| 17 | 25 | 22 | 31 | 44 | 54 | 55 | 77 | 93 |
| 17 | 22 | 25 | 31 | 44 | 54 | 55 | 77 | 93 |
| 17 | 22 | 25 | 31 | 44 | 54 | 55 | 77 | 93 |

Insertion:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 54 | 25 | 93 | 17 | 77 | 31 | 44 | 55 | 22 |
| 25 | 54 | 93 | 17 | 77 | 31 | 44 | 55 | 22 |
| 25 | 54 | 93 | 17 | 77 | 31 | 44 | 55 | 22 |
| 17 | 25 | 54 | 93 | 77 | 31 | 44 | 55 | 22 |
| 17 | 25 | 54 | 77 | 93 | 31 | 44 | 55 | 22 |
| 17 | 25 | 31 | 54 | 77 | 93 | 44 | 55 | 22 |
| 17 | 25 | 31 | 44 | 54 | 77 | 93 | 55 | 22 |
| 17 | 25 | 31 | 44 | 54 | 55 | 77 | 93 | 22 |
| 17 | 22 | 25 | 31 | 44 | 54 | 55 | 77 | 93 |
| 17 | 22 | 25 | 31 | 44 | 54 | 55 | 77 | 93 |

Quick Sort:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 54 | 25 | 93 | 17 | 77 | 31 | 44 | 55 | 22 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 22 | 25 | 17 | 31 | 44 |

|  |  |  |
| --- | --- | --- |
| 77 | 55 | 93 |

|  |
| --- |
| 54 |

|  |
| --- |
| 22 |

|  |  |  |
| --- | --- | --- |
| 25 | 31 | 44 |

|  |
| --- |
| 77 |

|  |
| --- |
| 93 |

|  |
| --- |
| 55 |

|  |
| --- |
| 17 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 17 | 22 | 25 | 31 | 44 | 54 | 55 | 77 | 93 |

2.

Bubble sort:

Array Before Bubble Sort  
54 25 93 17 77 31 44 55 22   
Before comparing  
Swapping  
Before comparing  
Before comparing  
Swapping  
Before comparing  
Swapping  
Before comparing  
Swapping  
Before comparing  
Swapping  
Before comparing  
Swapping  
Before comparing  
Swapping  
--------------  
Before comparing  
Before comparing  
Swapping  
Before comparing  
Before comparing  
Swapping  
Before comparing  
Swapping  
Before comparing  
Swapping  
Before comparing  
Swapping  
--------------  
Before comparing  
Swapping  
Before comparing  
Before comparing  
Swapping  
Before comparing  
Swapping  
Before comparing  
Before comparing  
Swapping  
--------------  
Before comparing  
Before comparing  
Before comparing  
Before comparing  
Before comparing  
Swapping  
--------------  
Before comparing  
Before comparing  
Before comparing  
Before comparing  
Swapping  
--------------  
Before comparing  
Before comparing  
Before comparing  
Swapping  
--------------  
Before comparing  
Before comparing  
Swapping  
--------------  
Before comparing  
--------------  
--------------  
Array After Bubble Sort  
17 22 25 31 44 54 55 77 93   
 ----jGRASP wedge2: exit code for process is 0.

8 compares

7 compares

6 compares

5 Compares

4 compares

3 compares

2 compares

1 compares

Selection sort:

Before Selection Sort  
54 25 93 17 77 31 44 55 22   
Before comparing  
Swapping  
Before comparing  
Before comparing  
Swapping  
Before comparing  
Before comparing  
Before comparing  
Before comparing  
Before comparing  
---------------  
Before comparing  
Before comparing  
Before comparing  
Before comparing  
Before comparing  
Before comparing  
Before comparing  
Swapping  
---------------  
Before comparing  
Swapping  
Before comparing  
Before comparing  
Swapping  
Before comparing  
Before comparing  
Before comparing  
Swapping  
---------------  
Before comparing  
Before comparing  
Swapping  
Before comparing  
Before comparing  
Before comparing  
---------------  
Before comparing  
Swapping  
Before comparing  
Swapping  
Before comparing  
Before comparing  
---------------  
Before comparing  
Before comparing  
Before comparing  
---------------  
Before comparing  
Swapping  
Before comparing  
---------------  
Before comparing  
---------------  
After Selection Sort  
17 22 25 31 44 54 55 77 93   
 ----jGRASP wedge2: exit code for process is 0.

7 compares

8 compares

6 compares

5 compares

4 compares

3 compares

2 compares

1 compares

Insertion Sort:

 ----jGRASP wedge2: pid for process is 3328.  
Before Insertion Sort  
54 25 93 17 77 31 44 55 22   
Before comparing  
Swapping  
---------------  
Before comparing  
---------------  
Before comparing  
Swapping  
Swapping  
Swapping  
---------------  
Before comparing  
Swapping  
---------------  
Before comparing  
Swapping  
Swapping  
Swapping  
---------------  
Before comparing  
Swapping  
Swapping  
Swapping  
---------------  
Before comparing  
Swapping  
Swapping  
---------------  
Before comparing  
Swapping  
Swapping  
Swapping  
Swapping  
Swapping  
Swapping  
Swapping  
---------------  
After Insertion Sort  
17 22 25 31 44 54 55 77 93   
 ----jGRASP wedge2: exit code for process is 0.

1 compares

1 compares

1 compares

1 compares

1 compares

1 compares

1 compares

1 compares

Quicksort sort:

 ----jGRASP wedge2: pid for process is 13416.  
Before Quick Sort  
54 25 93 17 77 31 44 55 22   
[54, 25, 93, 17, 77, 31, 44, 55, 22]  
Before comparing  
Swapping  
----------------------  
Before comparing  
----------------------  
Before comparing  
Swapping  
----------------------  
Before comparing  
----------------------  
Before comparing  
Swapping  
----------------------  
Before comparing  
Swapping  
----------------------  
Before comparing  
----------------------  
Before comparing  
Swapping  
----------------------  
Eoll: 5  
Pivot Point 54  
[22, 25, 17, 31, 44]  
Before comparing  
----------------------  
Before comparing  
Swapping  
----------------------  
Before comparing  
----------------------  
Before comparing  
----------------------  
Eoll: 1  
Pivot Point 22  
[25, 31, 44]  
Before comparing  
----------------------   
Before comparing  
----------------------  
Eoll: 2  
Pivot Point 25  
[31, 44]  
Before comparing  
----------------------  
Eoll: 3  
Pivot Point 31  
[77, 55, 93]  
Before comparing  
Swapping  
----------------------  
Before comparing  
----------------------  
Eoll: 7  
Pivot Point 77  
After Quick Sort  
17 22 25 31 44 54 55 77 93   
 ----jGRASP wedge2: exit code for process is 0.

8 compares

4 compares

2 compares

1 compare

2 compares

Based on the comparison of array above for the 4 different kind of sorting. It seems that insertion sorting is the most efficient kind of sorting for this kind of problems. The reason being is that it, it has the less amount of comparison compare to the other sorting. It seems to effectively and quick choose which number is the biggest and swap it with the number that is in its location. Since the problem is small and close to being sorted already, insertion sort is a lot easier to use to compare the numbers. Although quicksort is extremely good its isn’t as affective on sorting problem that is relatively small, since it takes times to divide and conquer the problem.