Data Structures and Algorithms.
Assignment - 2.

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Consider the following array of integer numbers:

3, 5, 78, 89, 456, 123, 23, 9, 7, 200, 308, 196, 345, 6.

Sort above using:

1. Bubble Sort.

2. Insertion Sort

3. Selection Sort

4. Quick Sort

5. Merge Sort.

Show every pass of sorting.

2 Insertion Sort

3, 5, 78, 89, 456, 123, 23, 9, 7, 200, 308, 196, 345, 6.

Step 1: Select (5) and compare with (3), no swap.

3, 5, 78, 89, 456, 123, 23, 9, 7, 200, 308, 196, 345, 6.

Step 2: Select (78) and compare with (5), no swap.

3, 5, 78, 89, 456, 123, 23, 9, 7, 200, 308, 196, 345, 6.

Step 3: Select (89) and compare with (78), no swap.

3, 5, 78, 89, 456, 123, 23, 9, 7, 200, 308, 196, 345, 6.

Step 4: Select (456) and compare with (89), no swap.

3, 5, 78, 89, 456, 123, 23, 9, 7, 200, 308, 196, 345, 6.

Step 5: Select (123) and compare with (456), (123) < (456), so place infront of (456).

3, 5, 78, 89, 123, 456, 23, 9, 7, 200, 308, 196, 345, 6.

Step 6: Select (23) and compare with elements on the left and insert it accordingly.

3, 5, 78, 89, 123, 456, 23, 9, 7, 200, 308, 196, 345, 6.

Step 7: Select (9) and compare with elements on the left and insert accordingly.

3, 5, 23, 78, 89, 123, 456, 9, 7, 200, 308, 196, 345, 6.

Step 8: Select (7) and compare with elements on the left and insert accordingly.

3, 5, 9, 23, 78, 89, 123, 456, 7, 200, 308, 196, 345, 6.

Step 9: Select (200) and compare with elements on the left, and insert accordingly.

3, 5, 7, 9, 23, 78, 89, 123, 456, 200, 308, 196, 345, 6.

Step 10: Select (308) and compare with elements on the left and insert accordingly.

3, 5, 7, 9, 23, 78, 89, 123, 200, 456, 308, 196, 345, 6.

Step 11: Select (196) and compare with elements on the left and insert accordingly.

3, 5, 7, 9, 23, 78, 89, 123, 200, 308, 456, 196, 345, 6.

Step 12: Select (345) and compare with elements on the left. and insert accordingly.

3, 5, 7, 9, 23, 78, 89, 123, 196, 200, 308, 456, 345, 6.

Step 13: Select (6) and compare with elements on the left and insert accordingly.   456,

3, 5, 7, 9, 23, 78, 89, 123, 196, 200, 308, 345, 6

Therefore, the sorted array of elements is :

3, 5, 6, 7, 9, 23, 78, 89, 123, 196, 200, 308, 345, 456

5. Merge Sort

3, 5, 78, 89, 456, 123, 23, 9, 7, 200, 308, 196, 345, 6.

| 3 | 5 | 78 | 89 | 456 | 123 | 23 |

| 9 | 7 | 200 | 308 | 196 | 345 | 6 |

| 3 | 5 | 78 |

| 89 | 456 | 123 | 23 |

| 9 | 7 | 200 |

| 308 | 196 | 345 | 6 |

| 3 |

| 5 | 78 |

| 89 | 456 |

| 123 | 23 |

| 9 |

| 7 | 200 |

| 308 | 196 |

| 345 | 6 |

| 5 |

| 78 |

| 89 |

| 456 |

| 123 |

| 23 |

| 7 |

| 200 |

| 308 |

| 196 |

| 345 |

| 6 |

| 3 | 5 | 78 |

| 89 | 456 |

| 23 | 123 |

| 7 | 9 | 200 |

| 196 | 308 |

| 6 | 345 |

| 23 | 89 | 123 | 456 |

| 6 | 196 | 308 | 345 |

| 3 | 5 | 23 | 78 | 89 | 123 | 456 |

| 6 | 7 | 9 | 196 | 200 | 308 | 345 |

| 3 | 5 | 6 | 7 | 9 | 23 | 78 | 89 | 123 | 196 | 200 | 308 | 345 | 456 |