

# Tutorial 4: Advanced Sorts

## Shell Sort

1. Write a function that implements a shell sort.
2. Trace your shell sort function on the array {0, 1, 4, 2, 3, 8, 5, 6, 7, 9}
3. Trace your shell sort function on the array {0, 1, 2, 3, 4, 5, 6, 7, 8, 9}
4. Trace your shell sort function on the array {1, 5, 2, 3, 4, 8, 6, 7, 9, 0}
5. Trace your shell sort function on the array {9, 8, 7, 6, 5, 4, 3, 2, 1, 0}
6. What is the worst case complexity of shell sort?

## Quick Sort

7. Write a function that implements a quicksort.
8. Trace your shell sort function on the array {0, 1, 4, 2, 3, 8, 5, 6, 7, 9}
9. Trace your shell sort function on the array {0, 1, 2, 3, 4, 5, 6, 7, 8, 9}
10. Trace your shell sort function on the array {1, 5, 2, 3, 4, 8, 6, 7, 9, 0}
11. Trace your shell sort function on the array {9, 8, 7, 6, 5, 4, 3, 2, 1, 0}
12. What is the worst case complexity of quicksort?
13. What is the average case complexity of quicksort?

## Merge Sort

14. Write a function that implements a shell sort.
15. Trace your shell sort function on the array {0, 1, 4, 2, 3, 8, 5, 6, 7, 9}
16. Trace your shell sort function on the array {0, 1, 2, 3, 4, 5, 6, 7, 8, 9}
17. Trace your shell sort function on the array {1, 5, 2, 3, 4, 8, 6, 7, 9, 0}
18. Trace your shell sort function on the array {9, 8, 7, 6, 5, 4, 3, 2, 1, 0}
19. What is the worst case complexity of merge sort? Prove it.
20. What is the average case complexity of merge sort? Prove it.