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Foundations of Programming
Assignment 7

1. Import random library
2. Import datetime from library
3. Initialize an empty list
4. Assign 1000 random numbers (0-9) to the empty list
5. Make a copy of the list
6. Display to use that time units
7. Get the current time
8. Sort the unordered list with the merge method
9. Get the current time
10. Determine how long the merge sort took but subtracting the first time taken from the second
11. Display merge time
12. Get the current time
13. Sort the unsorted list copy with the bubble sort method
14. Get the current time
15. Determine how long the bubble sort took but subtracting the first time taken from the second
16. Determine how much longer the bubble sort took compared to the merge
    a. Divide the time to sort with bubble by the time to sort with merge
17. Display the time difference

Best Sorting Algorithm Rational

The two algorithms I chose were Bubble and Merge. The Merge method is significantly more efficient because it uses the divide and conquer approach when splitting the list into two, it is a logarithmic function. The Bubble method individually indexes through each number at a time, comparing it to the number after it, which takes significantly longer, as it is a quadratic function.