| | Asymptotic Build Time Complexity | Build Time | Execution time analysis / n | Asymptotic Query Time | n = number of points / Query Time (without output onlt count of points in a range) | m = number of queries / m | Total execution time |
|---|---|---|---|---|---|---|---|
| 1D BST | O(nlogn) | 0.196 sec | ~90000 | O(logn+k) | 0.251 sec | ~98,000 | ~0.457 sec |
| 2D Range Tree with out Fractional cascading | O(nlogn) | 0.844 sec | ~91000 | O(logn^2+k) | 1.185 sec | ~94,000 | ~2.029 sec |
| 2D KD Tree | O(n) | 0.61sec | ~97,000 | O(sqrt(n)+k) | 35 sec | ~9,600 | ~36 sec |
| 2D Layered Range Tree( with fractional cascading) | O(nlogn) | 0.873 sec | ~93,000 | O(logn+k) | 0.56 sec | ~91,000 | ~1.4 sec |
| | | | | | Query with output | | |
| 2D Range Tree with out Fractional cascading | | 0.109 sec | ~10,000 | | 1.888 sec | ~9,100 | |
| 2D Layered Range Tree(with fractional cascading) | | 0.097 sec | ~10,000 | | 0.651 sec | ~9,100 | |
| | Asymptotic Memory Complexity | n | Experimental Memory | | | | |
| 1D BST | O(n) | ~10^5 | 13544KB | | | | |
| 2D Range Tree with out Fractional cascading | O(nlogn) | ~10^5 | 33444KB | | | | |
| 2D KD Tree | O(n) | ~10^5 | 23674KB | | | | |
| 2D Layered Range Tree( with fractional cascading) | O(nlogn) | ~10^5 | 31124KB | | | | |