**OFFLINE-1**

Fixed: Range of the elements 1~100 Variable: Array Length

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Array Length | Time | | | Swap | | | Comparisons | | |
| 1,000 | 0.003000 | 0.001000 | 0.001000 | 242484 | 243483 | 978 | 499500 | 242484 | 500499 |
| 5,000 | 0.072000 | 0.025000 | 0.047000 | 6217767 | 6222766 | 4934 | 12497500 | 6217767 | 12502499 |
| 10,000 | 0.327000 | 0.105000 | 0.183000 | 24574577 | 24584576 | 9875 | 49995000 | 24574577 | 50004999 |
| 50,000 | 7.804000 | 1.956000 | 3.665000 | 620223084 | 620273083 | 49521 | 1249975000 | 620223084 | 1250024999 |
| 1,00,000 | 31.734000 | 7.814000 | 14.567000 | 2484027978 | 2484127977 | 98993 | 4999950000 | 2484027978 | 5000049999 |
| 5,00,000 |  |  |  |  |  |  |  |  |  |
|  | Bubble | Insertion | Selection | Bubble | Insertion | Selection | Bubble | Insertion | Selection |

**OFFLINE-2**

Fixed: Length of the Array 1000 Variable: Array Element Density

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Element Range | Time | | | Swap | | | Comparisons | | | |
| 1~100 | 0.018450 | 0.008310 | 0.010425 | 252544 | 253543 | 989 | 499500 | 252544 | 500499 |
| 1~500 | 0.023104 | 0.010157 | 0.013039 | 255997 | 256996 | 989 | 499500 | 255997 | 500499 |
| 1~1,000 | 0.038333 | 0.010504 | 0.013002 | 254810 | 255809 | 997 | 499500 | 254810 | 500499 |
| 1~5,000 | 0.025286 | 0.008687 | 0.013160 | 250373 | 251372 | 995 | 499500 | 250373 | 500499 |
| 1~10,000 | 0.017857 | 0.008344 | 0.010591 | 250322 | 251321 | 990 | 499500 | 250322 | 500499 |
| 1~50,000 |  |  |  |  |  |  |  |  |  |
|  | Bubble | Insertion | Selection | Bubble | Insertion | Selection | Bubble | Insertion | Selection |