Exercise 2

1.

We tried for several times and when our X value reached 2,000,00,000 the time it takes has reached 10.39926605s.

3.

X = 100,000,000

|  |  |  |  |
| --- | --- | --- | --- |
| Number of Elements | ArrayList  (nanoseconds) | Linkedlist  (nanoseconds) | Array  (nanoseconds) |
| 2,500,000 | 0.125 | 0.472 | 0.015 |
| 5,000,000 | 0.280 | 0.863 | 0.030 |
| 10,000,000 | 0.829 | 1.863 | 0.026 |
| 50,000,000 | 2.155 | 7.188 | 0.065 |
| 100,000,000 | 4.022 | 16.652 | 0.120 |
| 100,010,000 | 4.903 | 16.519 | 0.190 |
| 100,100,000 | 3.847 | 16.228 | 0.201 |

As the number of elements increases, arraylists and arrays show steady and small increases, unlike linkedlist, it increases a lot as the number of elements goes up. Therefore, for a situation that requires programmers to gather huge information and manipulate them, we would recommend to use an array since it uses less time.