Big O Notation Lab

1. Observe the main.java in the base_code folder
    a. You are given code that tracks the nanosecond of the execution of code
    b. You are given an empty array that changes sizes as designated below
2. You will create 5 methods
    a. Randomize - Generates random numbers and assigns them to index in the array
        i. Range - 0 to 200,000
    b. Search - Generate a random number (0 to 200,000), search the array
        i. This requires Randomize
        ii. If found, return true. Otherwise, false
    c. Bubble Sort
        i. Sorts the randomized array
    d. Insertion Sort
        i. Sorts the randomized array
    e. Selection Sort
        i. Sorts the randomized array
3. Test each of these methods out with the code given. Document the results below
4. Estimate the Big O of each of the following

Array Size	**Randomize**	**Search**	**Bubble**	**Insertion**	**Selection**
Big O Estimate	O(n)	O(n)	O(n^2)	O(n^2)	O(n^2)
Big Ω Estimate	O(n)	O(1)	O(1)	O(n)	O(n^2)
10	619219	450968	4877	5041	4640
100	149151	5239	224215	91087	131054
1,000	937386	3618	17658803	15624371	18147231
10,000	755770	3531	291928672	105568503	189812959
100,000	6209072	4404	39367497859	1619180487	4273949799
1,000,000	34543356	17781	2107407249841	232797608974	470994103271
10,000,000	——————————**my computer crashed 2 times**——————————				