2nd Assignment

Time complexity of Sorting Algorithms

Self-Assessment: 80 ทำงานด้วยตนเอง แก้ไขปัญหาด้วยตนเองได้ แต่บางครั้งยังต้องขอคำแนะนำจากผู้อื่น

What I've learned: How does each sorting algorithm work

Program components:

1. Method used to read CSV file
2. Selection sort method
3. Insertion sort method
4. Bubble sort method
5. Shell sort method
6. Method that print specified number of data used when debugging

```
//Read CSV file using Scanner
static List<testData> readCSVFile(String fileName, int count) {...26 lines }

//Selection sort
static int selectionSort(List<testData> list) {...22 lines }

//Insertion sort
static int insertionSort(List<testData> list) {...20 lines }

//Bubble sort
static int bubbleSort(List<testData> list) {...22 lines }

//Shell sort
static int shellSort(List<testData> list) {...33 lines }

//Print all element in the list
//Using in debugging process
static void printList(List<testData> list) {...6 lines }
```

Test cases:

```
run:
Sorting random elements
Selection sort used: 0.4957783 seconds
Insertion sort used: 0.10008 seconds
Bubble    sort used: 0.5239645 seconds
Shell     sort used: 0.0215239 seconds

Adding 1 more element to the sorted array
Selection sort used: 0.5510521 seconds
Insertion sort used: 4.841E-4 seconds
Bubble    sort used: 0.2337681 seconds
Shell     sort used: 0.0085909 seconds

In decending order
Selection sort used: 0.3651839 seconds
Insertion sort used: 0.1650041 seconds
Bubble    sort used: 0.3395406 seconds
Shell     sort used: 7.286E-4 seconds
BUILD SUCCESSFUL (total time: 4 seconds)
```

After we sort 10000 elements randomly, adding 1 element into our sorted array and inversely sorting them

According to the result, we can summarize that Shell sort used least amount of time followed by Insertion sort Bubble sort and Selection sort