**Data manipulation:**

Case 1:

1. Date (yyyy-MM-dd):

2019-05-05

1. Check routeID is correct:

(Working properly).

1. Check Driver ID is correct:

Sunday

5 Drivers Today

ID: 2

ID: 10

ID: 11

ID: 13

ID: 14

1. Number of Rides for the day:

There are no rides for 2019-05-05 in the database.

There are no rides in the java code.

(Working properly).

1. Rides are in Proper Time Slices:
2. All rides were put into the Time separated Array:
3. Clusters properly made:
4. All rides were put into clusters:
5. Location clusters properly made:
6. All Locations were put into clusters:
7. All Drivers were assigned their routes:
8. All routes were written to the database:

With no rides in the database 5-12 are empty. (Working properly).

Case 2:

1. Date (yyyy-MM-dd):

2019-03-08

1. Check routeID is correct:

(Working Properly).

1. Check Driver ID is correct:

Friday

7 Drivers Today

ID: 1

ID: 2

ID: 3

ID: 4

ID: 6

ID: 13

ID: 14

(Working Properly)

1. Number of Rides for the day:

750 (working properly).

1. Rides are in Proper Time Slices:

Checked through print statements. (Working Properly).

1. All rides were put into the Time separated Array:

750 (Working Properly)

1. Clusters properly made:

(working properly)

1. All rides were put into clusters:

All 750 in.

1. Location clusters properly made:

(working properly)

1. All Locations were put into clusters:

All 1500 locations in.

1. All Drivers were assigned their routes:

Driver 1 has 184 locations

Driver 2 has 260 locations

Driver 3 has 248 locations

Driver 4 has 220 locations

Driver 6 has 210 locations

Driver 13 has 214 locations

Driver 14 has 164 locations

1. All routes were written to the database:

750 ride written into database.

Case 3:

1. Date (yyyy-MM-dd):

2019-03-09

1. Check routeID is correct:

(working properly)

1. Check Driver ID is correct:

Saturday

6 Drivers Today

ID: 6

ID: 7

ID: 8

ID: 9

ID: 13

ID: 14

1. Number of Rides for the day:

90

1. Rides are in Proper Time Slices:

All 90 in Array.

1. All rides were put into the Time separated Array:

Checked through print statements. (Working Properly).

1. Clusters properly made:

(working properly)

1. All rides were put into clusters:

90 rides. (working properly)

1. Location clusters properly made:

(working properly)

1. All Locations were put into clusters:

180 Locations

1. All Drivers were assigned their routes:

Driver 6 has 26 locations

Driver 7 has 32 locations

Driver 8 has 32 locations

Driver 9 has 28 locations

Driver 13 has 32 locations

Driver 14 has 30 locations

1. All routes were written to the database:

90 rides added to database

Case 4:

1. Date (yyyy-MM-dd):

2019-04-30

1. Check routeID is correct:

(working properly)

1. Check Driver ID is correct:

Tuesday

7 Drivers Today

ID: 2

ID: 3

ID: 4

ID: 5

ID: 6

ID: 13

ID: 14

1. Number of Rides for the day:

201

1. Rides are in Proper Time Slices:

(working properly)

1. All rides were put into the Time separated Array:

All 201 rides in.

1. Clusters properly made:

(working properly)

1. All rides were put into clusters:

All 201 rides in

1. Location clusters properly made:

(working properly)

1. All Locations were put into clusters:

402 Locations (working properly)

1. All Drivers were assigned their routes:

Driver 2 has 42 locations

Driver 3 has 52 locations

Driver 4 has 60 locations

Driver 5 has 72 locations

Driver 6 has 60 locations

Driver 13 has 60 locations

Driver 14 has 56 locations

1. All routes were written to the database:

201 rides written to database.

Case 5:

1. Date (yyyy-MM-dd):

2019-03-05

1. Check routeID is correct:

(working properly)

1. Check Driver ID is correct:

Tuesday

7 Drivers Today

ID: 2

ID: 3

ID: 4

ID: 5

ID: 6

ID: 13

ID: 14

1. Number of Rides for the day:

65 rides

1. Rides are in Proper Time Slices.

(working properly)

1. All rides were put into the Time separated Array:

65 rides in.

1. Clusters properly made:

(working properly)

1. All rides were put into clusters:

65 rides in

1. Location clusters properly made:

(working properly)

1. All Locations were put into clusters:

130 rides in.

1. All Drivers were assigned their routes:

Driver 2 has 18 locations

Driver 3 has 20 locations

Driver 4 has 18 locations

Driver 5 has 18 locations

Driver 6 has 18 locations

Driver 13 has 20 locations

Driver 14 has 18 locations

1. All routes were written to the database:

65 Rides were written to the database

**Test with Performance Ratio: (Elapsed Time)**

* Tested with 750 rides
  + Ratio 1:
    - Runtime: 01:48:05:577 (hh:mm:ss:SSS)
  + Ratio 0.5:
    - Runtime: 00:04:51:595 (hh:mm:ss:SSS)
  + Ratio 0.01:
    - Runtime: 00:03:47:00 (hh:mm:ss:SSS)
* Tested with (90) rides
  + Ratio 1:
    - Runtime: 00:00:29:489 (hh:mm:ss:SSS)
  + Ratio 0.5:
    - Runtime: 00:00:29:347 (hh:mm:ss:SSS)
  + Ratio 0.01:
    - Runtime: 00:00:29:28 (hh:mm:ss:SSS)
* Tested with (201) rides
  + Ratio 1:
    - Runtime: 00:01:04:885 (hh:mm:ss:SSS)
  + Ratio 0.5:
    - Runtime: 00:01:05:626 (hh:mm:ss:SSS)
  + Ratio 0.01:
    - Runtime: 00:01:05:747 (hh:mm:ss:SSS)

This shows that the performance ratio isn’t very important on smaller sizes of data but makes a huge difference on larger sizes of data.