Objective: Design an inquiry system for Taiwan traffic data

(1) UML Class Diagram and Sequence Diagram

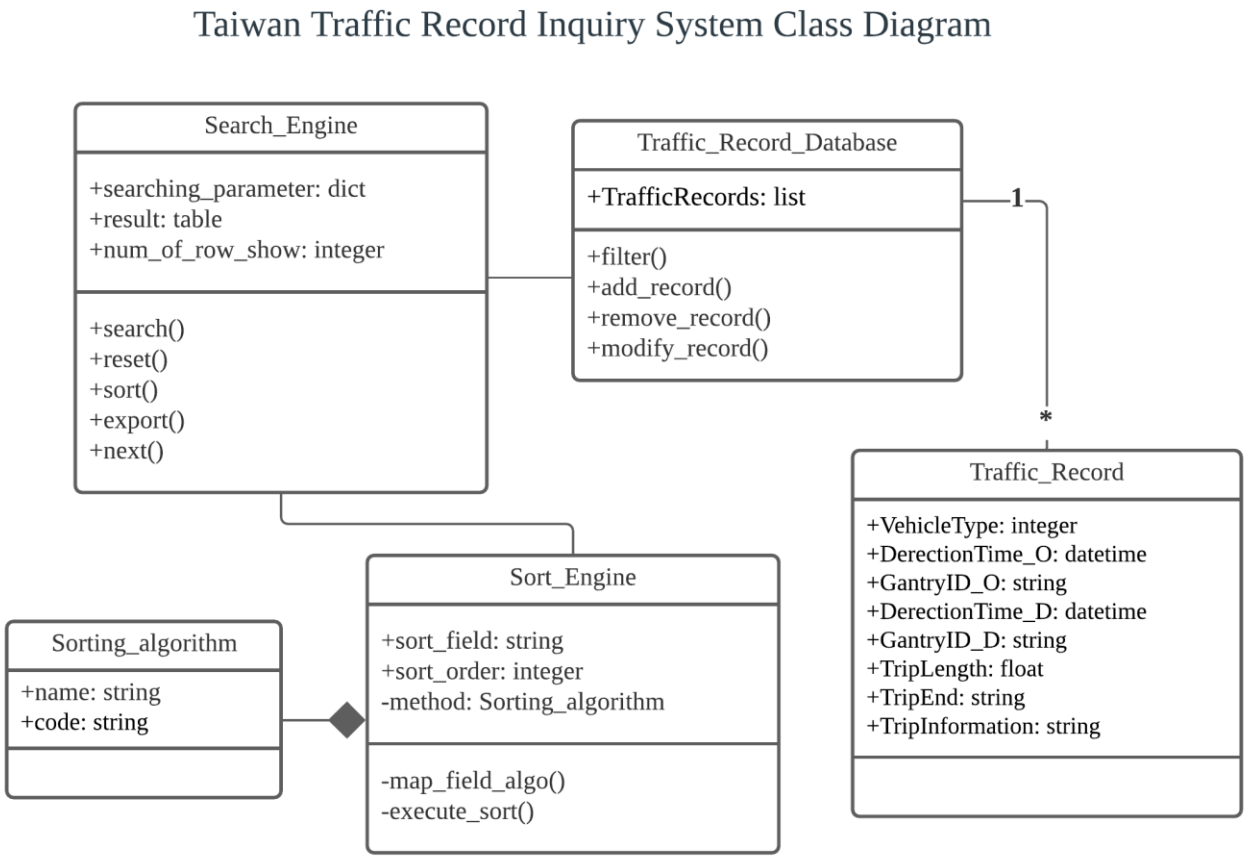


Figure 1

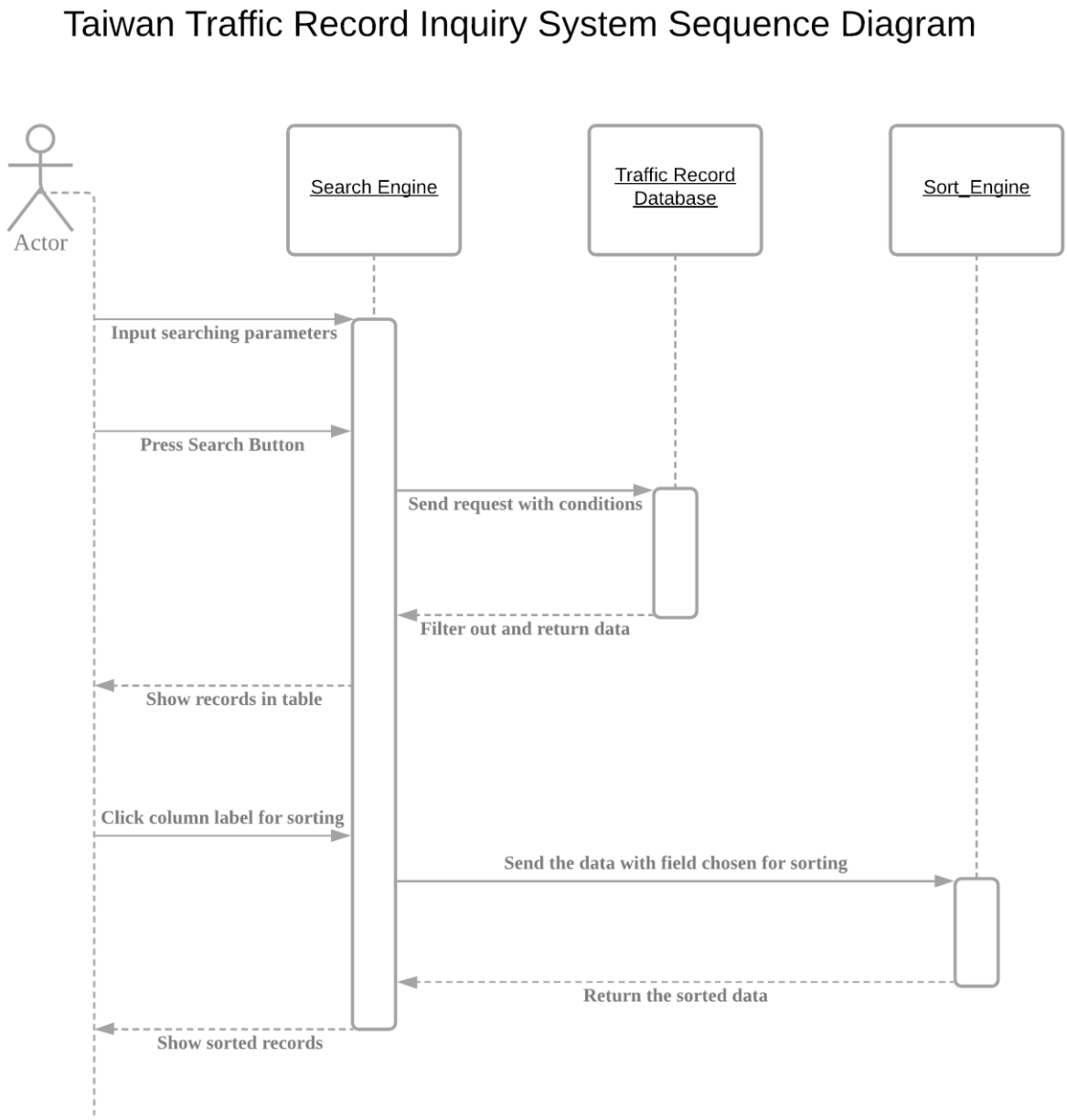

Taiwan Traffic Record Inquiry System Sequence Diagram
Actor
Search Engine
Traffic Record Database
Sort_Engine
Input searching parameters
Press Search Button
Send request with conditions
Filter out and return data
Show records in table
Click column label for sorting
Send the data with field chosen for sorting
Return the sorted data
Show sorted records

Figure 2

(2) Interface Specification

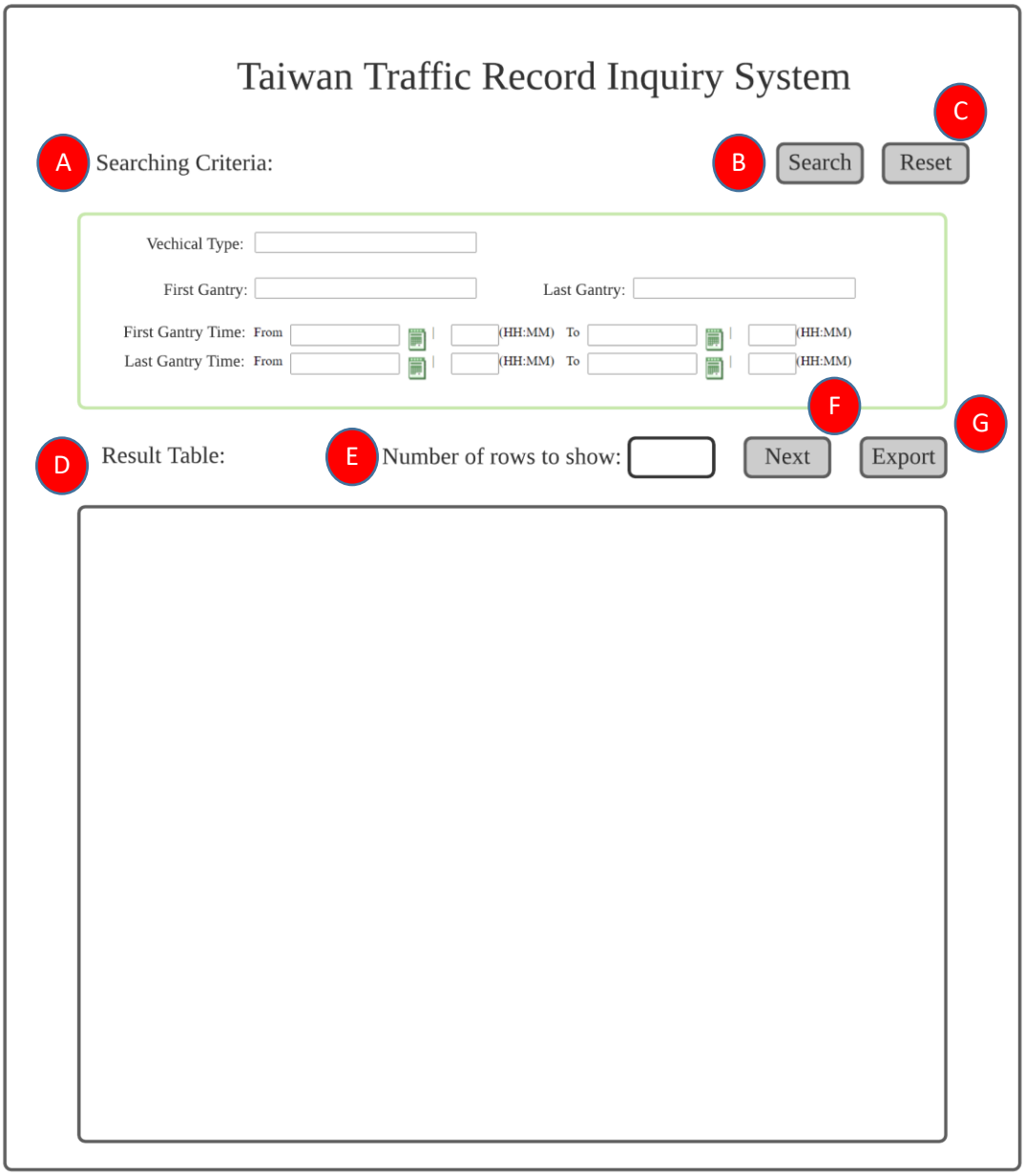
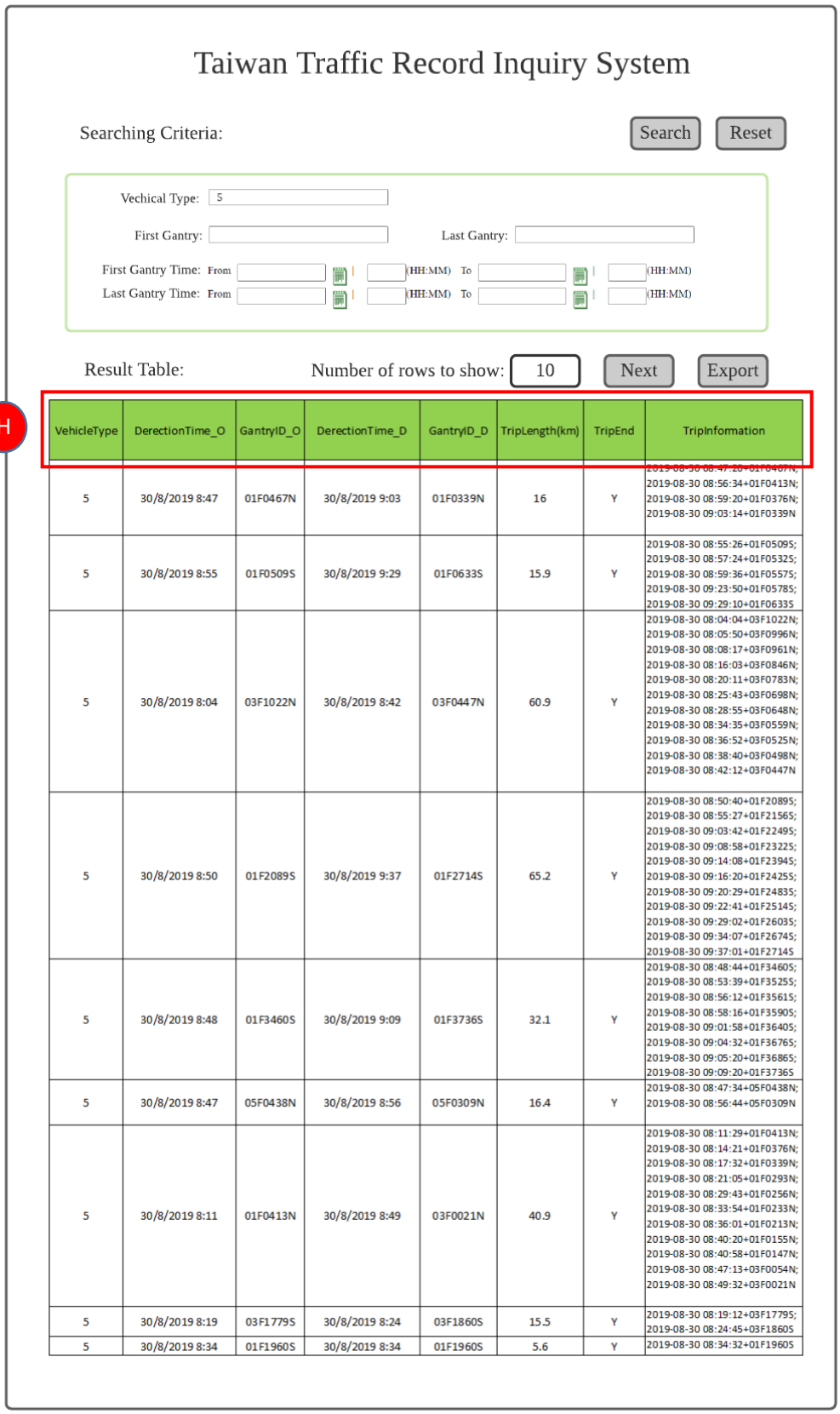


Figure 3

Specification:

i. User need to specify the searching criteria by filling the information in respective box in the “Search Criteria” (A).
ii. Once the “Search button” (B) is pressed, the “Search_Engine” will update the “searching_parameter” dictionary and send to “Traffic_Record_Database”. If no criteria is specified, an empty dictionary will be sent.
iii. “Traffic_Record_Database” will then filter out and return the data according to the “searching_parameter”.
iv. The required tracffic record will be displayed in the “Result Table” (D).
v. The default number of rows to be shown is 10, user can change it in (E).



VehicleType	DerectionTime_O	GantryID_O	DerectionTime_D	GantryID_D	TripLength(km)	TripEnd	TripInformation
5	30/8/2019 8:47	01F0467N	30/8/2019 9:03	01F0339N	16	Y	2019-08-30 08:56:34+01F0413N; 2019-08-30 08:59:20+01F0376N; 2019-08-30 09:03:14+01F0339N
5	30/8/2019 8:55	01F0509S	30/8/2019 9:29	01F0633S	15.9	Y	2019-08-30 08:55:26+01F0509S; 2019-08-30 08:57:24+01F0532S; 2019-08-30 08:59:36+01F0557S; 2019-08-30 09:23:50+01F0578S; 2019-08-30 09:29:10+01F0633S
5	30/8/2019 8:04	03F1022N	30/8/2019 8:42	03F0447N	60.9	Y	2019-08-30 08:04:04+03F1022N; 2019-08-30 08:05:50+03F0996N; 2019-08-30 08:08:17+03F0961N; 2019-08-30 08:16:03+03F0846N; 2019-08-30 08:20:11+03F0783N; 2019-08-30 08:25:43+03F0698N; 2019-08-30 08:28:55+03F0648N; 2019-08-30 08:34:35+03F0559N; 2019-08-30 08:36:52+03F0525N; 2019-08-30 08:38:40+03F0498N; 2019-08-30 08:42:12+03F0447N
5	30/8/2019 8:50	01F2089S	30/8/2019 9:37	01F2714S	65.2	Y	2019-08-30 08:50:40+01F2089S; 2019-08-30 08:55:27+01F2156S; 2019-08-30 09:03:42+01F2249S; 2019-08-30 09:08:58+01F2322S; 2019-08-30 09:14:08+01F2394S; 2019-08-30 09:16:20+01F2425S; 2019-08-30 09:20:29+01F2483S; 2019-08-30 09:22:41+01F2514S; 2019-08-30 09:29:02+01F2603S; 2019-08-30 09:34:07+01F2674S; 2019-08-30 09:37:01+01F2714S
5	30/8/2019 8:48	01F3460S	30/8/2019 9:09	01F3736S	32.1	Y	2019-08-30 08:48:44+01F3460S; 2019-08-30 08:53:39+01F3525S; 2019-08-30 08:56:12+01F3561S; 2019-08-30 08:58:16+01F3590S; 2019-08-30 09:01:58+01F3640S; 2019-08-30 09:04:32+01F3676S; 2019-08-30 09:05:20+01F3686S; 2019-08-30 09:09:20+01F3736S
5	30/8/2019 8:47	05F0438N	30/8/2019 8:56	05F0309N	16.4	Y	2019-08-30 08:47:34+05F0438N; 2019-08-30 08:56:44+05F0309N
5	30/8/2019 8:11	01F0413N	30/8/2019 8:49	03F0021N	40.9	Y	2019-08-30 08:11:29+01F0413N; 2019-08-30 08:14:21+01F0376N; 2019-08-30 08:17:32+01F0339N; 2019-08-30 08:21:05+01F0293N; 2019-08-30 08:29:43+01F0256N; 2019-08-30 08:33:54+01F0233N; 2019-08-30 08:36:01+01F0213N; 2019-08-30 08:40:20+01F0155N; 2019-08-30 08:40:58+01F0147N; 2019-08-30 08:47:13+03F0054N; 2019-08-30 08:49:32+03F0021N
5	30/8/2019 8:19	03F1779S	30/8/2019 8:24	03F1860S	15.5	Y	2019-08-30 08:19:12+03F1779S; 2019-08-30 08:24:45+03F1860S
5	30/8/2019 8:34	01F1960S	30/8/2019 8:34	01F1960S	5.6	Y	2019-08-30 08:34:32+01F1960S

Figure 4

vi. An example is shown in Figure 4. By pressing the “Next” button (F), the next batch record will be shown.

vii. The data could be exported (.csv and .pdf) by pressing the “Export” button (G).

viii. By pressing the “Reset” button (C), all input searching criteria and data table will be removed.

ix. User can sort the data table by pressing the column label (H). When a column label is pressed, the “Search_Engine” will send the data and field chosen to the “Sort_Engine” which will map the defined sorting algorithm and do the sorting. The sorted table will be returned and displayed.

x. An upward arrow will be displayed nearby the chosen column field which indicates the table is sorted by the field in ascending order. If the same column label is clicked again, a downward arrow will be displayed which indicates descending order. An example is shown in Figure 5.

Taiwan Traffic Record Inquiry System

Searching Criteria: Search Reset

Vechical Type: 5

First Gantry: Last Gantry:

First Gantry Time: From (HH:MM) To (HH:MM)

Last Gantry Time: From (HH:MM) To (HH:MM)

Result Table: Number of rows to show: 10 Next Export

VehicleType	DerectionTime_O	GantryID_O	DerectionTime_D	GantryID_D	TripLength(km)	TripEnd	TripInformation
5	30/8/2019 8:04	03F1022N	30/8/2019 8:42	03F0447N	60.9	Y	2019-08-30 08:04:04+03F1022N; 2019-08-30 08:05:50+03F0996N; 2019-08-30 08:08:17+03F0961N; 2019-08-30 08:16:03+03F0846N; 2019-08-30 08:20:11+03F0783N; 2019-08-30 08:25:43+03F0698N; 2019-08-30 08:28:55+03F0648N; 2019-08-30 08:34:35+03F0559N; 2019-08-30 08:36:52+03F0525N; 2019-08-30 08:38:40+03F0498N; 2019-08-30 08:42:12+03F0447N
5	30/8/2019 8:11	01F0413N	30/8/2019 8:49	03F0021N	40.9	Y	2019-08-30 08:11:29+01F0413N; 2019-08-30 08:14:21+01F0376N; 2019-08-30 08:17:32+01F0339N; 2019-08-30 08:21:05+01F0293N; 2019-08-30 08:29:43+01F0256N; 2019-08-30 08:33:54+01F0233N; 2019-08-30 08:36:01+01F0213N; 2019-08-30 08:40:20+01F0155N; 2019-08-30 08:40:58+01F0147N; 2019-08-30 08:47:13+03F0054N; 2019-08-30 08:49:32+03F0021N
5	30/8/2019 8:19	03F1779S	30/8/2019 8:24	03F1860S	15.5	Y	2019-08-30 08:19:12+03F1779S; 2019-08-30 08:24:45+03F1860S
5	30/8/2019 8:34	01F1960S	30/8/2019 8:34	01F1960S	5.6	Y	2019-08-30 08:34:32+01F1960S
5	30/8/2019 8:47	01F0467N	30/8/2019 9:03	01F0339N	16	Y	2019-08-30 08:47:20+01F0467N; 2019-08-30 08:56:34+01F0413N; 2019-08-30 08:59:20+01F0376N; 2019-08-30 09:03:14+01F0339N
5	30/8/2019 8:47	05F0438N	30/8/2019 8:56	05F0309N	16.4	Y	2019-08-30 08:47:34+05F0438N; 2019-08-30 08:56:44+05F0309N
5	30/8/2019 8:48	01F3460S	30/8/2019 9:09	01F3736S	32.1	Y	2019-08-30 08:48:44+01F3460S; 2019-08-30 08:53:39+01F3525S; 2019-08-30 08:56:12+01F3561S; 2019-08-30 08:58:16+01F3590S; 2019-08-30 09:01:58+01F3640S; 2019-08-30 09:04:32+01F3676S; 2019-08-30 09:05:20+01F3686S; 2019-08-30 09:09:20+01F3736S
5	30/8/2019 8:50	01F2089S	30/8/2019 9:37	01F2714S	65.2	Y	2019-08-30 08:50:40+01F2089S; 2019-08-30 08:55:27+01F2156S; 2019-08-30 09:03:42+01F2249S; 2019-08-30 09:08:58+01F2322S; 2019-08-30 09:14:08+01F2394S; 2019-08-30 09:16:20+01F2425S; 2019-08-30 09:20:29+01F2483S; 2019-08-30 09:22:41+01F2514S; 2019-08-30 09:29:02+01F2603S; 2019-08-30 09:34:07+01F2674S; 2019-08-30 09:37:01+01F2714S
5	30/8/2019 8:55	01F0509S	30/8/2019 9:29	01F0633S	15.9	Y	2019-08-30 08:55:26+01F0509S; 2019-08-30 08:57:24+01F0532S; 2019-08-30 08:59:36+01F0557S; 2019-08-30 09:23:50+01F0578S; 2019-08-30 09:29:10+01F0633S