

## Boston Makmur Gemilang Data Engineer Test

Summary: After we have successfully migrated our Json files to PostgreSQL server, we will split and connect between each table to creates relationship.

Details:

Database : PostgreSQL

Server : Localhost

Explanations:

The exam test & Exam\_test\_Datas are the result of the json files we have migrated recently from python.

Exam\_test table:

- index : Automatically generated by python
- event: Indicates the type of event
- oon: Indicates on which entity event occurred
- at:timestamp of the entity
- data: This is the list of nested JSON ( we parsed it into - another tables on Exam\_test\_Datas )
- organization\_id : Identifies the organization event belongs to

Exam_test		
123	index	int8
ABC	event	text
ABC	oon	text
🕒	at	timestampz
📄	data	json
ABC	organization_id	text

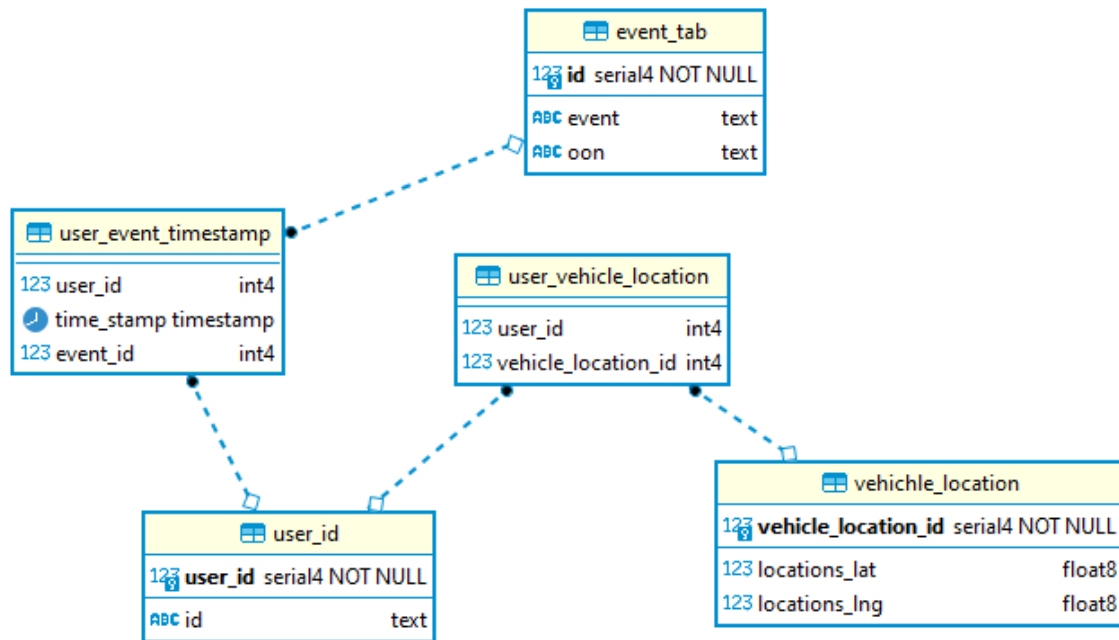
Exam\_test\_Datas table:

- index : Automatically generated by python
- id : The user id of the vehicle
- locations\_lat : The latitude of the vehicle
- locations\_lng : The longitude of the vehicle
- locations\_at : The timestamp
- starts: Timestamp
- finish: Timestamp

Exam_test_Datas		
123	index	int8
ABC	id	text
123	locations_lat	float8
123	locations_lng	float8
ABC	locations_at	text
ABC	starts	text
ABC	finish	text

Problems: as we can see, both of the tables contains a lot of information, and it has to be normalized and breakdown to avoid the anomalies or redundancy in the upcoming times.

Solution: creates a separates table to store each unique attributes as a primary key



Explanations : we have divided our table into a more approachable design, now that each unique attributes has primary key.

User\_id table

- User\_id = Unique Key/ Primary Key
- Id = The id of the user

vehicle\_location table

- vehicle\_location\_id = Unique Key/Primary Key
- locations\_lat = The latitude of the vehicle
- locations\_lng = The longitude of the vehicle

user\_vehicle\_location table: serves as an intermediate table for both user and vehicle tables

- user\_id = Foreign key of user\_id
- vehicle\_location\_id = Foreign key of vehicle\_id

Event\_tab table

- id = Unique Key/ Primary key
- event: Indicates the type of event
- oon: Indicates on which entity event occurred

user\_event\_timestamp : user event timestamp tables uses both user\_id & timestamp to indicates precisely when one's event take times

- user\_id = Foreign key of user\_id
- timestamp = timestamp
- event\_id = Foreign key of event\_id

Before Normalization:

Exam\_test\_Datas table

	123 index	abc id	123 locations_lat	123 locations_lng	abc locations_at	abc starts	abc finish
1	0	bac5188f-67c6-4965-81dc-4ef49622e280	52.45133	13.46045	2019-06-01T18:17:10.101Z	[NULL]	[NULL]
2	1	3a3eb23a-f22e-4fe9-8c20-f37220a81909	52.45848	13.52647	2019-06-01T18:17:10.109Z	[NULL]	[NULL]
3	2	f0b87796-b25c-40b0-9145-8822509c17e	52.50309	13.33435	2019-06-01T18:17:10.109Z	[NULL]	[NULL]
4	3	9152c5d8-79cf-4fe3-96ad-359abb08a72c	52.50536	13.51655	2019-06-01T18:17:10.111Z	[NULL]	[NULL]
5	4	f06eb89c-ada0-41cb-bdd1-0a60398f901	52.49697	13.44936	2019-06-01T18:17:10.111Z	[NULL]	[NULL]
6	5	9d6a8840-def2-42b6-af24-f19a3c6de059	52.46324	13.34227	2019-06-01T18:17:10.111Z	[NULL]	[NULL]
7	6	3b0640d6-502d-4623-b782-39cc789b4e8	52.57786	13.26756	2019-06-01T18:17:10.111Z	[NULL]	[NULL]
8	7	98c8b8cb-7c2b-415d-ad30-fa9f0571a5f	52.50036	13.25032	2019-06-01T18:17:10.111Z	[NULL]	[NULL]
9	8	d6880741-ae7f-4741-aa04-950b0a1e2d3l	52.47874	13.32032	2019-06-01T18:17:10.111Z	[NULL]	[NULL]
10	9	d759fc35-b25c-4877-8e40-9b0104447b3	52.44846	13.46759	2019-06-01T18:17:10.111Z	[NULL]	[NULL]
11	10	49c02de6-2bc6-46ca-9e55-8eb656a9096	52.44493	13.24099	2019-06-01T18:17:10.111Z	[NULL]	[NULL]
12	11	949798fc-50aa-47a4-a7e0-db418ee2abi	52.55031	13.51002	2019-06-01T18:17:10.111Z	[NULL]	[NULL]
13	12	e641b45f-f007-4d7a-af94-b81b8a05a325	52.48219	13.25166	2019-06-01T18:17:10.111Z	[NULL]	[NULL]
14	13	b4dac3b4-0142-4319-bce2-1324760294e	52.4743	13.54158	2019-06-01T18:17:10.112Z	[NULL]	[NULL]
15	14	46952066-0a94-4a2a-9c31-08c93f8ea3f1	52.48389	13.2538	2019-06-01T18:17:10.112Z	[NULL]	[NULL]
16	15	ae413d00-fb27-4761-8655-4b8c0ff4a8e	52.45518	13.47735	2019-06-01T18:17:10.121Z	[NULL]	[NULL]
17	16	a38edd77-07b0-4069-8a1d-462428989ec	52.44395	13.24243	2019-06-01T18:17:10.121Z	[NULL]	[NULL]
18	17	804ac7f0-cf1d-4b29-9ed2-9bebecf7600f	52.44176	13.50779	2019-06-01T18:17:10.121Z	[NULL]	[NULL]
19	18	46f718d4-50de-4684-bf36-63135a3e2dcf	52.47633	13.45905	2019-06-01T18:17:10.121Z	[NULL]	[NULL]
20	19	8af00c5-3b7e-f74a-80b6-7685ee1a2f6a	52.482	13.28308	2019-06-01T18:17:10.121Z	[NULL]	[NULL]

Exam\_test table:

	123 index	abc event	abc oon	at	data	abc organization_id
1	0	update	vehicle	2019-06-02 01:17:10.101 +0700	{"id": "bac5188f-67c6-4965-81dc-4ef49622e280"	org-id
2	1	update	vehicle	2019-06-02 01:17:10.109 +0700	{"id": "3a3eb23a-f22e-4fe9-8c20-f37220a81909"	org-id
3	2	update	vehicle	2019-06-02 01:17:10.109 +0700	{"id": "f0b87796-b25c-40b0-9145-8822509c17e"	org-id
4	3	update	vehicle	2019-06-02 01:17:10.111 +0700	{"id": "9152c5d8-79cf-4fe3-96ad-359abb08a72c"	org-id
5	4	update	vehicle	2019-06-02 01:17:10.111 +0700	{"id": "f06eb89c-ada0-41cb-bdd1-0a60398f901"	org-id
6	5	update	vehicle	2019-06-02 01:17:10.111 +0700	{"id": "9d6a8840-def2-42b6-af24-f19a3c6de059"	org-id
7	6	update	vehicle	2019-06-02 01:17:10.111 +0700	{"id": "3b0640d6-502d-4623-b782-39cc789b4e8"	org-id
8	7	update	vehicle	2019-06-02 01:17:10.111 +0700	{"id": "98c8b8cb-7c2b-415d-ad30-fa9f0571a5f"	org-id
9	8	update	vehicle	2019-06-02 01:17:10.111 +0700	{"id": "d6880741-ae7f-4741-aa04-950b0a1e2d3l"	org-id
10	9	update	vehicle	2019-06-02 01:17:10.111 +0700	{"id": "d759fc35-b25c-4877-8e40-9b0104447b3"	org-id
11	10	update	vehicle	2019-06-02 01:17:10.111 +0700	{"id": "49c02de6-2bc6-46ca-9e55-8eb656a9096"	org-id
12	11	update	vehicle	2019-06-02 01:17:10.111 +0700	{"id": "949798fc-50aa-47a4-a7e0-db418ee2abi"	org-id
13	12	update	vehicle	2019-06-02 01:17:10.111 +0700	{"id": "e641b45f-f007-4d7a-af94-b81b8a05a325"	org-id
14	13	update	vehicle	2019-06-02 01:17:10.112 +0700	{"id": "b4dac3b4-0142-4319-bce2-1324760294e"	org-id
15	14	update	vehicle	2019-06-02 01:17:10.112 +0700	{"id": "46952066-0a94-4a2a-9c31-08c93f8ea3f1"	org-id
16	15	update	vehicle	2019-06-02 01:17:10.121 +0700	{"id": "ae413d00-fb27-4761-8655-4b8c0ff4a8e"	org-id
17	16	update	vehicle	2019-06-02 01:17:10.121 +0700	{"id": "a38edd77-07b0-4069-8a1d-462428989ec"	org-id
18	17	update	vehicle	2019-06-02 01:17:10.121 +0700	{"id": "804ac7f0-cf1d-4b29-9ed2-9bebecf7600f"	org-id
19	18	update	vehicle	2019-06-02 01:17:10.121 +0700	{"id": "46f718d4-50de-4684-bf36-63135a3e2dcf"	org-id
20	19	update	vehicle	2019-06-02 01:17:10.121 +0700	{"id": "8af00c5-3b7e-f74a-80b6-7685ee1a2f6a"	org-id

After Normalization:

User\_id table

user_id   Enter a SQL expression to filter results (use Ctrl+Space)		
Grid	id	123 user_id
1	1f216202-7341-4cc6-8ceb-f0137922c931	1
2	50c70318-5eed-4c67-b0dc-e70034dc93f6	2
3	a48f97e3-8751-4f5e-a653-5fd767fc66ec	3
4	4362cefe-04ff-4967-a94f-039e2c9a0cc6	4
5	a81f1a4c-cde0-4298-80e1-46cf778a0fed	5
6	766616f4-cdf2-4677-9387-88e8e62a8b74	6
7	8fb3804f-7161-4461-9565-a143f454417d	7
8	0317b799-8d70-4822-8b05-34a8f7f097c4	8
9	216ca33b-0a20-4102-83ae-9647b46363ea	9
10	8d1a51ab-fab1-4650-8265-701c58c58fd6	10
11	fee1c42b-ca4e-4a6a-bb6f-cb3f216cdb07	11
12	5ab1577c-6beb-407b-90c9-2f83020633f9	12
13	1aef6d50-0d54-4cdb-bc81-0593af751bbe	13
14	be4ef438-b327-4385-85a3-05a9965f8be6	14

Vehicle location table

Properties   Data   ER Diagram   post			
vehichle_location   Enter a SQL expression to filter results (use Ctrl+Space)			
Grid	123 locations_lat	123 locations_lng	123 vehicle_location_id
1	52.43445	13.24601	1
2	52.50872	13.37199	2
3	52.45518	13.47735	3
4	52.49816	13.29035	4
5	52.50469	13.29936	5
6	52.483	13.28398	6
7	52.53846	13.30718	7
8	52.452	13.48522	8
9	52.49964	13.30558	9
10	52.44493	13.24099	10
11	52.47874	13.32032	11
12	52.55579	13.53007	12
13	52.45147	13.46026	13
14	52.48219	13.25166	14
15	52.47492	13.45471	15
16	52.55031	13.51002	16
17	52.47002	13.36857	17
18	52.53946	13.40028	18
19	52.58095	13.28932	19
20	52.53887	13.33677	20

## Event\_tab table

Properties Data ER Diagram			
event_tab Enter a SQL expression to filter results (u			
Grid	ABC event	ABC oon	123 id
1	deregister	vehicle	1
2	create	operating_period	2
3	register	vehicle	3
4	update	vehicle	4

## User\_event\_timestamp table

Properties Data ER Diagram			
user_event_timestamp Enter a SQL expression to filter results (i			
Grid	123 user_id	time_stamp	123 event_id
1	46	2019-06-02 01:17:10.101	4
2	16	2019-06-02 01:17:10.109	4
3	20	2019-06-02 01:17:10.109	4
4	33	2019-06-02 01:17:10.111	4
5	87	2019-06-02 01:17:10.111	4
6	83	2019-06-02 01:17:10.111	4
7	66	2019-06-02 01:17:10.111	4
8	27	2019-06-02 01:17:10.111	4
9	77	2019-06-02 01:17:10.111	4
10	79	2019-06-02 01:17:10.111	4
11	44	2019-06-02 01:17:10.111	4
12	32	2019-06-02 01:17:10.111	4

## User\_vehicle\_location table

Properties Data ER Diagram		
user_vehicle_location Enter a SQL expression to		
Grid	123 user_id	123 vehicle_location_id
1	46	71
2	16	22
3	20	61
4	33	98
5	87	78
6	83	49
7	66	94
8	27	75
9	77	11
10	79	42
11	44	10

Thank you for your attentions, let's move on to the visualization part.