Task 1a (1 Questionnaires)

https://github.com/jeanbou/Coding_Interview_Preparation/tree/master/SES/task1a

1) Could you illustrate the main pitfalls of such a design?

The main pitfall is the duplicates in all columns except ID (PK) & Date of Registration

(1) Each person is unique?

No, it's not unique. We can have in France many Marie Martin (Martin is the most popular surname in France) with the different ID. We can also have Serge Martin and Ivan Budnyk with the same ID, the last one has found the lost Serge's ID on the street and photo-shopped it for his own new fake identity. Another problem except Ivan's fake ID is that in EU people can have different 27 formats of their national IDs + 27 Formats of Passports (also ID), so it's risky to use this attribute as a primary key because you can have chance to have the same national ID of Estonia and let's say passport ID of Portugal.

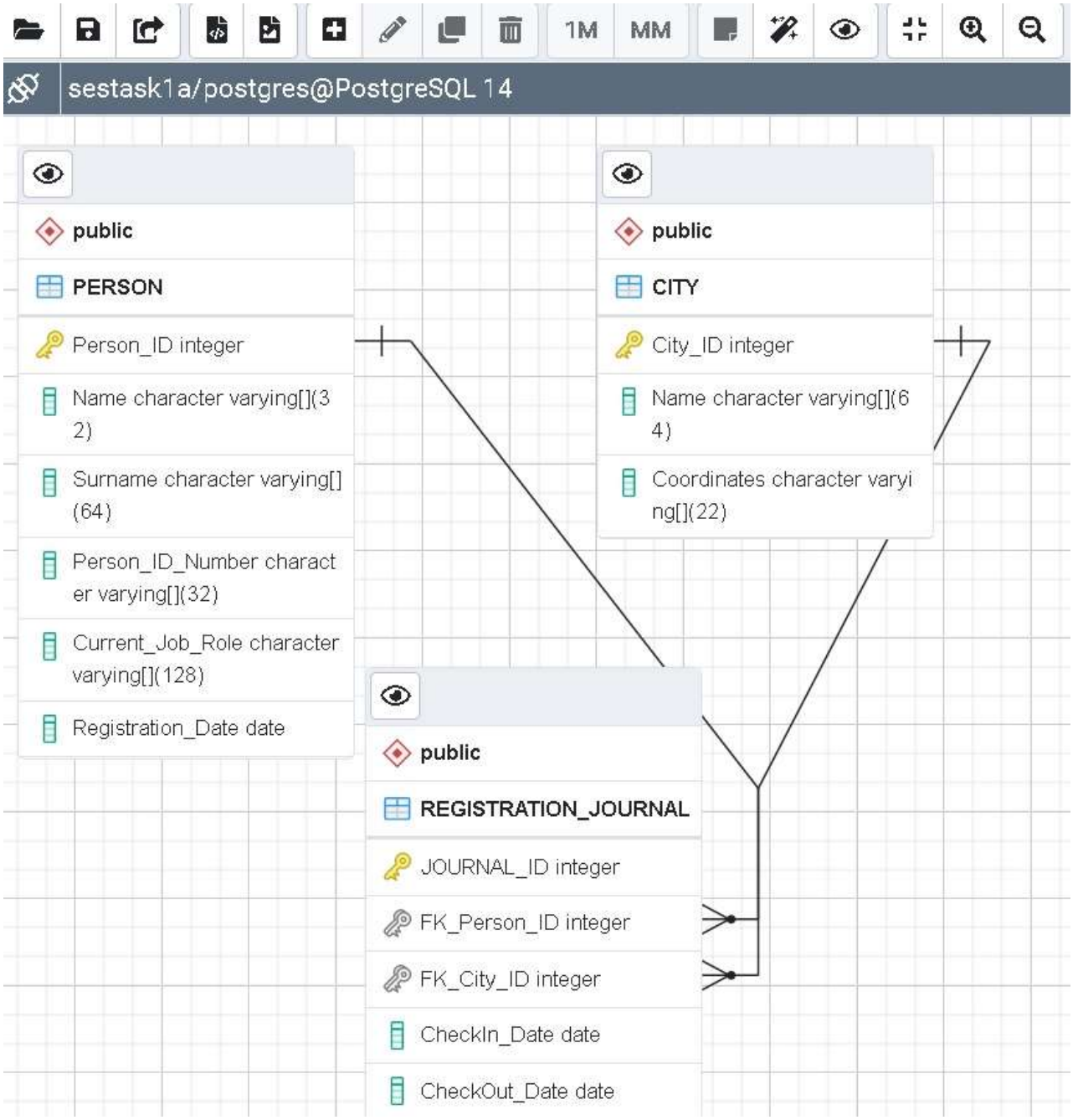
(2) The same person can live in different cities at different times?

One can live in Rome (as a student) & be registered in the same time for voting & parents' tax optimizing purposes in Milano. Therefore, I proposed to add to extra column check in & check out dates

2) How would you re-arrange such design.

The ultimate goal (however the reality is always slightly different) of such redesign is to have DB in 5NF https://en.wikipedia.org/wiki/Database_normalization#Satisfying_5NF and to satisfy the business need of the customer.

The business need of this table (DB) is to have a journal of peoples' current living place(s). Unfortunately, a reality suggests that during the move person formally can live in two cities in parallel (there is always an overlap from administration point of view: taxes, phone bills; banks & etc). Therefore, if one wants to satisfy the business need of this client, I propose the following re-design with extra 2 columns



The main table is **REGISTRATION_JOURNAL** and column CheckOut_date can have null as an indicator of the fact that leaving a city, a person didn't finish the whole formality.

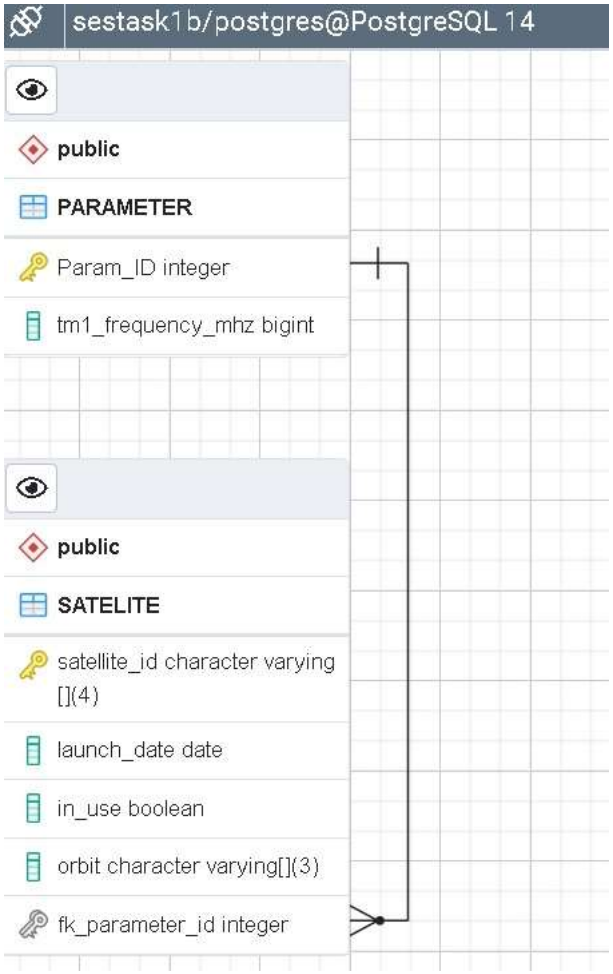
Note that ROLE (Profession) can be also put as a separate table, but for the moment I prefer to have 128 char field, because in really a Job Roles vary a lot and it's a quite unique attribute, if during the storing we find out that there are so many CEOs & Software Engineers and that enough for business customer needs, in this case, yes, I'll create a separate table **PROFESSION** and Curent_Job_Role in the table **PERSON** will be turn into **FK_Current_Job_Role_ID**, but something tells me that end user prefers to have not a *Java IT Engineer*, but *Java Backend Specialist of Adobe Experience Manager CMS* in this field.

Task 1b (1 Questionnaires)

https://github.com/jeanbou/Coding_Interview_Preparation/tree/master/SES/task1b

Define the following database schema

If under the term “to expand/add more in the future” we mean that the parameters can be easily precise by the mean of the column adding, well, in this case I propose the following schema



The abbreviation ‘MEO’ is not define in the document, but following our Thursday discussion I am 99.9% sure that it stands for *Medium Earth Orbit* **so** it’s a definitely one of the values of an attribute *“orbit”* of the table **SATELITE**

Therefore, **The Query**

Query Editor Query History

```
1  SELECT SAT.satellite_id FROM public."SATELITE" AS SAT
2  INNER JOIN public."PARAMETER" AS PARAM ON SAT.fk_parameter_id = PARAM."Param_ID"
3  WHERE SAT.orbit = '{MEO}' AND PARAM.tm1_frequency_mhz = 19008
```

The result of **Query**

Data Output | Explain | Messages | Notifications

	satellite_id [PK] character varying[] (4)
1	{1111}
2	{111N}

The 2 Tables **SATELITE** & **PARAMETER** that I used for my test

SATELITE

Data Output | Explain | Messages | Notifications

	satellite_id [PK] character varying[] (4)	launch_date date	in_use boolean	orbit character varying[] (3)	fk_parameter_id integer
1	{1111}	2021-03-01	true	{MEO}	1
2	{111N}	2019-11-11	true	{MEO}	3
3	{2M22}	2021-03-02	false	{GEO}	3
4	{2M23}	2019-12-14	false	{GEO}	1
5	{3MDF}	2020-03-11	true	{MEO}	2
6	{S1FG}	2019-12-12	true	{MEO}	4

PARAMETER

Data Output | Explain | Messages | Notifications

	Param_ID [PK] integer	tm1_frequency_mhz bigint
1	1	19008
2	2	19010
3	3	19008
4	4	19011