

Guild Tamers

Part I: Planting

Given the following narrative:

1. Generate the corresponding ERD¹ and RM².
2. Generate the corresponding queries in SQL (it is recommended to first generate them first in Relational Algebra).

1 Narrative

We are in a parallel dimension, where there are what in ours we know as monsters (Cyclopes, Chimeras, Krakens, Chupacabras...). However, killing monsters doesn't do much good in this world. For one thing, they can't be eaten. Moreover, some of their species are considered as threaten with extinction, so their hunting is forbidden by law. So, we have been contacted by the Confederation of Tamers' Guilds to model the system that will hold the data from the quests of the different tamers enrolled in these guilds.

As we said, our main clients are the guilds. For each of them, we must register: Tax-Id, name, and the list of cities where they operate.

Then, we have our tamers, all of them obviously affiliated to one of the Confederation guilds. From these people, in addition to their union affiliation, we need to register their Tax-Id, National-Id, name and surname, and date of birth. (Let us remember that in Argentina the TaxId had to be created because there used to be NationalID duplicates. In any case, it is still not possible to simply discard the NationalIds...)

These tamers are grouped into teams, whose data of interest is: name, date of creation and date of disbandment. Each tamer constitutes a team, even if he/she is the sole member of that team.

Additionally, our tamers socialize a lot with each other. This is so to the point that they follow their colleagues' adventures. In this way, each of the tamers registered in our system can follow and/or be followed by another tamer. Special care must be taken in cases of harassment due to fanaticism. It is not uncommon for whoever received the highest reward in the last month to be overwhelmed with requests for money. Then, it is necessary to identify potential harassment cases in order to being able to follow up appropriately and, if needed, being able to act appropriately in case of threat or persecution.

Of course, guilds would not be as important as they are if they did not offer quests to their members. Of course, guilds are very zealous of their quests, to the point that they require that each quest is necessarily associated with a particular guild. For these quests, we are interested in their identifier (an alphanumeric code), name, start date, end date, reward and description (composed of a summary and a body).

1 ERD: Entity-Relationship Diagram.

2 RM: Relational Model.

To formalize the acceptance of a quest by a tamer (regardless of the team to which he or she belongs to at that time), he or she is made to sign a contract, of which the date of acceptance and the eventual date of fulfillment are recorded. Said contract must be registered due to legal obligations.

Most of the quests involve taming one or more monsters. Beyond that, an inventory of known monsters is also kept. Of these, their name (which is unique), type, and amount of inner energy are recorded. All these elements are taken into account by the tamers when choosing a quest to carry out.

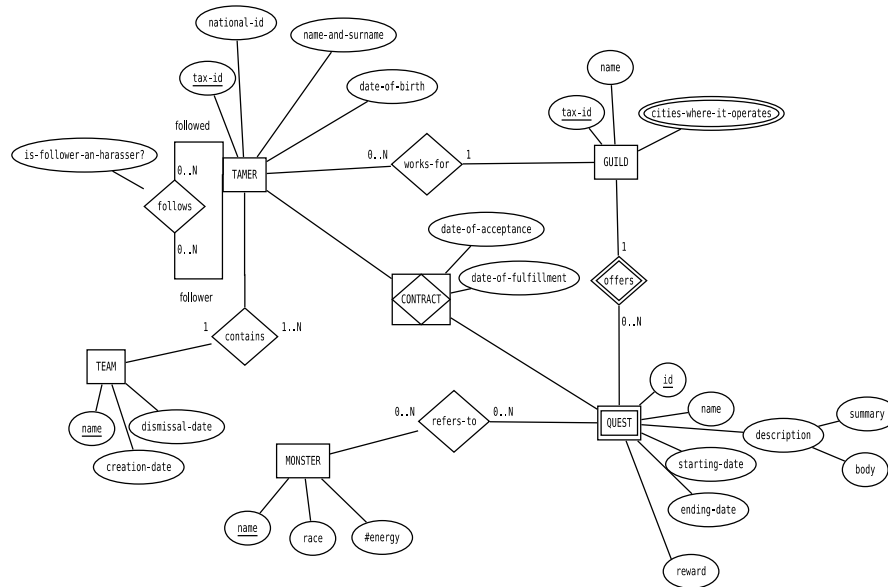
2 Queries

Solve the following queries:

1. Number of Tamers.
2. Number of Tamers with at least one follower.
3. Number of Tamers that have no followers.
4. Number of Tamers operating in the city of Córdoba.
5. Number of Quests that belong to the "TOITFD" Guild (Tamers of the Big Island of Tierra del Fuego).
6. Number of Quests that refer to a "Chupacabra".
7. Number of Quests that belong to a guild that operates in the city of Córdoba.
8. All data for all untamed Krakens (a kraken is a type of monster).
9. Data of the quest that offers the highest reward.
10. The average of the last 10 contracts accepted (but not yet completed) of the Guild "UTCPBA" (Union of Tamers of the Center of the Province of Buenos Aires).

Part II: Solution

1 Entity-Relationship Model



2 Relational Model

Primary Key (constituted by one or more attributes)

Foreign Key (always constituted by a single attribute; there can be several in a relationship; they can constitute part of a primary key)

Relationship	Primary Key	Foreign Key(s)
GUILDS < <u>tax-id</u> , name>	<tax-id>	
GUILDS_CITY = < <u>guild_id</u> , <u>city</u> >	<guild_id,city>	guild_id → GUILDS.tax-id
TAMERS = < <u>tax-id</u> , dni , full_name , d_birth , <u>guild_id</u> >	tax-id	guild_id → GUILDS.tax-id
FOLLOW_UP = < <u>id_followed</u> , <u>id_follower</u> , is-follower-an-harasser?>	<followed_id,follower_id>	id_followed → TAMERS.tax-id follower_id → TAMERS.tax-id
TEAMS = < <u>name</u> , date_create, date_disband>	<name>	
TAMERS_TEAMS = < <u>team_name</u> , <u>tamer_tax-id</u> , date_created, date_disbanded>	<team_name, tamer_tax-id>	team_name → TEAMS.name tamer_tax-id → TAMERS.tax-id
QUESTS = < <u>guild_id</u> , <u>quest_id</u> , name, d_start, d_end, bounty, description_summary, description_body>	<guild_id, quest_id>	guild_id → GUILDS.tax-id
CONTRACTS = < <u>tamer_tax-id</u> , <u>guild_id</u> , <u>quest_id</u> , date_acceptance, date_fulfillment>	<tamer_tax-id, guild_id, quest_id>	tamer_tax-id → TAMERS.tax-id <guild_id, quest_id> → <QUESTS.guild_id, QUESTS.id>
MONSTERS = < <u>name</u> , type, #Energy>	<name>	
MONSTERS_QUESTS= < <u>monster_id</u> , <u>guild_id</u> , <u>quest_id</u> >	<monster_id, guild_id, quest_id>	monster_id → MONSTERS.name <guild_id, quest_id> → <QUESTS.guild_id, QUESTS.id>

3 Sample Data

(ATTENTION: Boolean data, ID numbers, TaxId, and dates are shown in an illustrative way, so that it is easy to read them. In a real database engine, their representation will be slightly different. It remains as an exercise for whoever reads will determine its final representation in the chosen engine.)

Relationship	Example Tuples
GUILDS < <u>tax-id</u> , name>	<30-11,111,111-1, "ABC"> <30-22,222,222-2, "IJK"> <30-33,333,333-3, "XYZ">
GUILDS_CITY = < <u>guild_id</u> , <u>city</u> >	<30-11,111,111-1, "Cordoba"> <30-11,111,111-1, "River Galician"> <30-33,333,333-3, "Resistance">
TAMERS = < <u>tax-id</u> , national-id , full_name , date_birth , <u>guild_id</u> >	<44-44,444,444-4,44,444,444, "John Perez," "11.13, 1888," 30-22,222,222-2> <88-88,888,888-8,88,888,888, "Homer Jay", "1907.09.02",30-33,333,333-3> <55-55,555,555-5.55,555,555, "Hannah Lopez," "1898.01.28," 30-33,333,333-3> <66-66.666.666-6,66.666.666, "Alejo López", "1908.01.02",30-33.333.333-3> <77-77.777.777-7,77.777.777, "Laura Alem", "1918.02.02",30-22.222.222-2>
FOLLOW_UP = < <u>id_followed</u> <u>, id_follower</u> , is- follower-an-harasser?>	<55-55,555,555-5,44-44,444,444-4, True> <44-44,444,444-4.55-55,555,555-5, True> <77-77,777,777-7.55-55,555,555-5, False>
TEAMS = < <u>name</u> , date_create, date_disband>	<"The Lone Rangers", 1308.01.01, 1388.01.01> <"The Powerpuff Girls", 2300.01.01, 2301.01.01> <"Platero and I", 1308.01.01, 1388.01.01>
TAMERS_TEAMS = < <u>team_name</u> <u>, tamer_tax-id</u> , date_created, date_disbanded>	<"The Powerpuff Girls", 77-77.777.777- 7> <"The Powerpuff Girls", 55-55.555.555- 5> <"The Lone Rangers", 44-44.444.444-4> <"The Lone Rangers", 88-88.888.888-8> <"Platero and I", 66-66.666.666-6>
QUESTS = < <u>guild_id</u> , <u>quest_id</u> , name, date_start, date_end, reward, description_summary, description_body>	<30-11.111.111-1, 001, "Rescue the prince", 2022.02.02, 2022.04.02, 50,000,000, "The prince must be rescued.", "Poor guy, he can't swim."> <30-33.333.333-3, 001, "Lower the Chupacabra from the roof", 2022.02.05, 2022.04.01, 40,000,000, "You have to rescue the park Chupacabra.", "Poor thing, he got lost and can't go down.">
CONTRACTS = < <u>cuil tamer(a)</u> , <u>guild_id</u> , <u>quest_id</u> , f_acceptance, f_compliance>	<88-88.888.888-8, 30-33.333.333-3, 001, 2022.03.02, 2022.03.05>
MONSTERS = < <u>name</u> , type, #Energy>	<"Chupi-chups", Chupacabras, 39839>

MONSTERS_QUESTS = < <u>monster_id</u> , <u>guild_id</u> , <u>quest_id</u> >	<"Lollipops", 30-33.333.333-3, 001>
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4 Queries

(TBD)