Sistemas de Informação e Bases de Dados 2021/2022

Project Assignment - Part 1

In this Part 1 of the project assignment, you will design a database model to answer the information requirements of an application whose domain is presented below. Your job is to deliver a concise and clean data model using the Entity-Association model graphic notation taught in class and, along with it, identify and specify the appropriate Integrity Constraints.

Domain Description

You have been asked to design an information system to manage a Boating Management System.

Every boat has a name. Boat names are sometimes long and are not always unique. Every boat is registered in a country with a unique country national identifier. The year of registration must also be recorded. Any boat with a fixed VHF radio must also have the MMSI identifier.

The owner of the boat may not be the person who sails it. Not all sailors own the boat. Some owners are sailors. Some sailors do not like to sail on weekends. Regarding owners, we need to record their birthdate as well. Regarding any person (i.e., owners or sailors), it is necessary to know their name and national ID card number.

Sailors can reserve a boat for a certain scheduled date interval if they are available for those dates. Reserved boats are then ready to sail on multiple trips for the same reservation. Trips have a start location, an end location, a take-off date, and a duration in days. Trip durations must be recorded.

Every location has a name, a latitude and a longitude. Location names may repeat but not at the same latitude and longitude. Any two locations must be at least one nautical mile apart.

There are three types of locations: Ports, Marinas and Wharfs. Every location exists in the maritime authority of a given country. A country has a unique name, a unique flag, and a unique standard ISO code. Every country where boats can be registered must have at least one maritime location.

When travelling to a country, the boat must exhibit, besides the flag of the country of registration, the flag of the waters/location jurisdiction country.

Work to be developed

1. Design an **Entity-Association model diagram** for the problem domain presented in the previous section.
2. Identify those situations that are inconsistent in the problem domain, but that are allowed in the presented Entity-Association model, and **define a set of Integrity Constraints** that complete the proposed model in order to prohibit situations that are invalid.

Aspects to keep in mind

Please keep in mind the following aspects while developing your work:

- The Entity-Association model must be **expressed** in **the notation taught in class**;
- The Integrity Constraints to the Entity-Association model must be written as **assertions expressed in terms of the concepts in the Entity-Association model**, that is, in terms of attributes, entities, and relationships between them;
- The **cleanliness** and **conciseness** of the model will be **evaluated.**

Report format and submission

The project assignment will be evaluated based on a report submitted by the students. The report must contain responses to the items requested above.

The following table shows the value of each part of the work to be carried out.

Item	**Relative Maximum Grading**
Entity Association Model	16/20
Integrity Constraints	4/20

The report should start with a cover page with the title "**SIBD Project - Part 1"**, with the **name and number of students**, the **relative percent of each student's contribution**, together with the **total effort (in hours) that each element of the group dedicated to the project**, the **number of the group**, the **shift to which the group belongs**, and **the name of the laboratory teacher.**

Length: In addition to the cover sheet, the report shall have a **maximum** of **2 pages**.

The report will have to be submitted in two versions:

- Digital version, in PDF format, with name `delivery-01-GG.pdf` (where `GG` is the group number), to be submitted via Fénix System until the delivery date.
- Paper printed version, to be handed to the teacher in the next laboratory shift.