Weekly exercises IN3020 and IN4020
Week 1

January 21, 2022

1 The relational model

1. In the context of the relational model, what defines the following types of keys:
   - Super key
   - Candidate key
   - Primary key
2. Why are the following statements false?
   - A relation cannot have multiple superkeys.
   - A candidate key can include excess attributes as long as the key still uniquely identifies tuples.
   - Foreign keys cannot refer to attributes in other tables.
3. Can you think of other types of restraints that we may put on data, that are not expressible via primary and foreign keys? Hint: look for "Domain Constraints" the Web.

2 PostgreSQL Review

Note:

To use the PostgreSQL databases in this course, you should log in to a Linux terminal at IFI or log in remotely.
`psql -h dbpg-ifi-kurs02 -U [username] -d in3020_[username]`
will log you in to you personal database. Here you will be able to create tables, insert, update etc.
`psql -h dbpg-ifi-kurs02 -U [username] -d fdb`
will log you in to the movie database. This database is read only.

1. Log in to your PostgreSQL environment
   Information on how this can be done is found at `https://www.uio.no/studier/emner/matnat/ifi/IN2090/h21/programvare/postgres.pdf`
2. Create the table `Ships` with the following information:
   - `ship_id`
   - `name`

   Let `ship_id` be the primary key.
3. Insert the following data into the table `Ships`:
   - (1, Pequod)
   - (2, Titanic)
   - (3, Le pharaon)
4. Create a table `Persons` with the attributes:
   - `name`
   - `ssn`
   - `street address`
   - `ZIP code`

   Use reasonable datatypes.
5. What is a reasonable primary key?
6. Alter the table and add a primary key
7. Do you think there should be any check constraints in the table?
8. Insert the following data into the table `Persons`:
   - (Ishmael, 111111110, 20 Cooper Square Manhattan, 10001),
   - (Captain Ahab, 111111112, 16 Nantucket Avenue, 02554),
   - (Queequeg, 111111113, Rocovoco, 99991),
   - (Molly Brown, 111111114, Hannibal Missouri, 63401)
   - (Edmond Dantes, 111111115, Marseille, 13003)
9. Create a table `Crew` with the attributes:
   - `ssn`
   - `ship_id`
10. Let the combination of `ssn` and `ship_id` be the primary key.

11. Add foreign keys to `Persons` and `Ships`
12. Insert the following data into the table `Crew`
    - (111111110, 1)
    - (111111112, 1)
    - (111111113, 2)
    - (111111114, 3)
13. Use SQL to find all persons with an address containing Manhattan
14. Print out the name of the persons that were crew on the ship `Pequod`. Order the names alphabetically.
15. Use SQL to find how many crew members there were on the ship `Titanic`