Assignment 3

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Part One: The social media features

From the ER-diagram, there is the entity Subscriber with the primary keys
<u>username</u> and <u>number</u>. Thus, we will have a table named Subscriber and we
will make (<u>username</u>, <u>number</u>) to be the primary key pair. There are also
attributes email, hash and salt in the entity Subscriber. We will use large strings
CLOB for <u>username</u>. For <u>number</u>, INT is used for the type and we will let it
automatically increment (GENERATED ALWAYS AS IDENTITY). We would
use VARCHAR(320) to store email. Since hash and salt values require 64-byte
each, we would use BINARY(64) for each of them. Since all the above attributes
are required to create a subscriber, all of them need to be not null (except for
<u>number</u> since it is already automatically incremented). The relational schema
for Subscriber table is

$$\textbf{Subscriber}(\underline{username}: \text{CLOB},$$
$$\underline{number}: \text{INT},$$
$$email: \text{VARCHAR(320)},$$
$$hash: \text{BINARY(64)},$$
$$salt: \text{BINARY(64)}).$$

The ER-diagram has a many-to-many relationship Friend_Of between Sub-
scriber and Subscriber. Thus, we will have a table name Friend_Of. The primary
keys of the Subscriber will be the primary keys of the Friend_Of. Since there are
two subscribers, we will have a 4-tuple primary key (<u>funame</u>, <u>funum</u>, <u>tuname</u>,
<u>tunum</u>). <u>funame</u> is short for from username, which is the username of the sub-
scriber who is following and <u>funum</u> is short for from user number, which is the
number of the subscriber who is following. Similarly, <u>tuname</u> and <u>tunum</u> is the
username and the user number of the subscriber who is being followed, respec-
tively. Thus, <u>funame</u> and <u>tuname</u> would reference <u>username</u> (column) of the
Subscriber table while <u>funum</u> and <u>tunum</u> would reference <u>number</u> (column) of
the Subscriber table. Since the domain of the attribute <u>username</u> in the Sub-
scriber table is CLOB, we need to use CLOB to be the domain of the attributes
(keys) <u>funame</u> and <u>tuname</u>. Similarly, we need to use INT for <u>funum</u> and <u>tunum</u>.
All of the attributes would be not null as well. We also need to check that a
subscriber is not following themselves. The relational schema for the Friend_Of

table is

$$\textbf{Friend\_Of}(\underline{\text{funame}}: \text{CLOB},$$
$$\underline{\text{funum}}: \text{INT},$$
$$\underline{\text{tuname}}: \text{CLOB},$$
$$\underline{\text{tunum}}: \text{INT}).$$