**CSCI 3287**

**Spring 2016 Database System**

**Assignment 1**

**Exercise 2.2.1:** In Fig. 2.6 are instances of two relations that might constitute part of a banking database. Indicate the following:

1. The attributes of each relation.

Accounts Relation:

acctNo, type, balance

Customers Relation:

firstName, lastName, idNo, account

b) The tuples of each relation.

Accounts Relation:

(12345, savings, 12000)

(23456, checking, 1000)

(34567, savings, 25)

Customers Relation:

(Robbie, Banks, 901-222, 12345)

(Lena, Hand, 805-333, 12345)

(Lena, Hand, 805-333, 23456)

c) The components of one tuple from each relation.

Accounts Relation:

The first tuple has components:

12345, savings, 12000

for attributes acctNo, type, balance.

Customers Relation:

The first tuple has components:

Robbie, Banks, 901-222, 12345

for attributes firstName, lastName, idNo, account.

d) The relation schema for each relation.

Accounts relation schema:

Accounts(acctNo, type, balance)

Customers relation schema:

Customers(firstName, lastName, idNo, account)

e) The database schema.

Accounts(acctNo: int, type: String, balance: int)

Customers(firstName: String, lastName:String, idNo:String, account:String)

f) A suitable domain for each attribute.

Accounts:

acctNo real

type string

balance real

Customers:

firstName string

lastName string

idNo string

account string

g) Another equivalent way to present each relation.

Accounts:

|  |  |  |
| --- | --- | --- |
| acctNo | balance | type |
| 12345 | 12000 | savings |
| 34567 | 25 | savings |
| 23456 | 1000 | checking |

Customers:

|  |  |  |  |
| --- | --- | --- | --- |
| idNo | account | lastName | firstName |
| 805-333 | 12345 | Hand | Lena |
| 805-333 | 23456 | Hand | Lena |
| 901-222 | 12345 | Banks | Robbie |

**Exercise 2.2.2:** In Section 2.2.7 we suggested that there are many examples of attributes that are created for the purpose of serving as keys of relations. Give some additional examples.

For a database dealing with courses within a college, a course number can be used as a key attribute, as it is unique for each course. Another example would be a student ID number for a database of kids in a particular school, each child would have a one-of-a-kind ID number.

**Exercise 2.2.3:** How many different ways (considering orders of tuples and attributes) are there to represent a relation instance if that instance has:

a) Three attributes and three tuples, like the relation Accounts of Fig. 2.6?

3! \* 3! = 36

b) Four attributes and five tuples?

4! \* 5! = 24 \* 120 = 2880

c) n attributes and m tuples?

n! \* m!