Algorithms and datastructures
Exercises

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6.1 Indicate the following according to figure 1.

acctNo	*type*	*balance*
12345	savings	12000
23456	checking	1000
34567	savings	25

The relation **Accounts**

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

The relation **Customers**

Figure 1: Two relations of a banking database

6.1.a The attributes of each realtion

Accounts: $acctNo$, $type$, $balance$
Customers: $firstName$, $lastName$, $idNo$, $account$

6.1.b The tuples of each realtion

- 12345, $savings$, 12000
- 23456, $checking$, 1000
- 34567, $savings$, 25

- *Robbie*, *Banks*, 901 − 222, 12345
- *Lena*, *Hand*, 805 − 333, 12345
- *Lena*, *Hand*, 805 − 333, 23456

6.1.c The components of one tuble of each realtion

12000
Banks

6.1.d The relation schema of each realtion

$Accounts(acctNo, type, balance)$
$Customers(firstName, lastName, idNo, account)$

6.1.e The database schema

$Accounts, Customers$

6.1.f A suitable domain of each attribute

- $acctNo$ - INT
- $type$ - $VARCHAR$[20]
- $balance$ - INT
- $firstName$ - $VARCHAR$[20]
- $lastName$ - $VARCHAR$[20]
- $idNo$ - $CHAR$[7]
- $account$ - INT

6.1.g Another equivalent way to present each relation.

The attributes could simply just be in a different order.

6.2 In a table with the following attributes which are valid example of keys

$$title, year, length, genre, studioName, producerC\#$$

- title, year
- title, year, studioName
- title, length
- length, genre, studioName, year

6.3 How many ways can relation be represented if it has:

6.3.a Four attributes and five tuples

$4! \cdot 5! = 2880$

6.3.b n attributes and m tuples

$n! \cdot m!$

6.4 Write a database schema of the following relations

The datasbase schema includes
$Product(make, model, type)$
$PC(model, speed, ramhd, price)$
$Laptop(model, speed, ram, hd, screen, price)$
$Printer(model, color, type, price)$

6.4.a Write a schema for *Product*

CREATE TABLE Product(VARCHAR[20] maker, INT model, INT type)
The type is here an int where 0 is PC, 1 is laptop and 2 is printer. There is no foreign keys due to it being the lookup table for the other relations

6.4.b Write a schema for *PC*

CREATE TABLE PC(INT model, FLOAT speed, INT ram, BOOLEAN hd, FLOAT prize, FOREIGN KEY(Products) REFERENCES Products(model))
Here the model is a reference to products, speed is gigahertz of CPU

6.4.c Write a schema for *Printer*

CREATE TABLE Printer(INT model, BOOLEAN color, VARCHAR[20] type, FLOAT price, FOREIGN KEY(Products) REFERENCES Products(model))

6.4.d Write an alternation for Printer and delete the attribute color

ALTER TABKE Printer DROP color

6.4.e Add an *od* attribute for PC, which defaults to none an otherwise can be cd or dvd

ALTER TABLE PC ADD VARCHAR[20] od DEFAULT 'none'