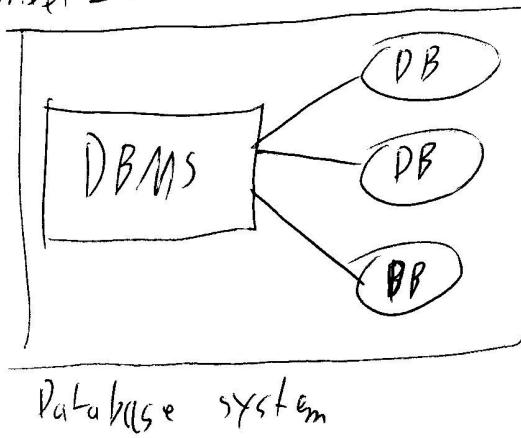


# DB Worksheet 2:

① a)



Database management system:

queries, load, stores... the data  
in a database

Database:

The place (server) where the data  
gets stored in a logical structure

Database system:

combination of DBMS and Database

b) Redundancy:

Redundancy on a data level:

- Data that stores a information exist more than once.  
Both entries hold thereby the same information.

Redundancy on the application level:

- Different application use/excess the data the same way/  
for the same purpose.

Consistency:

Data (especially attributes), are defined after a set of rules.  
Data must fit those constrain before and after every transaction.

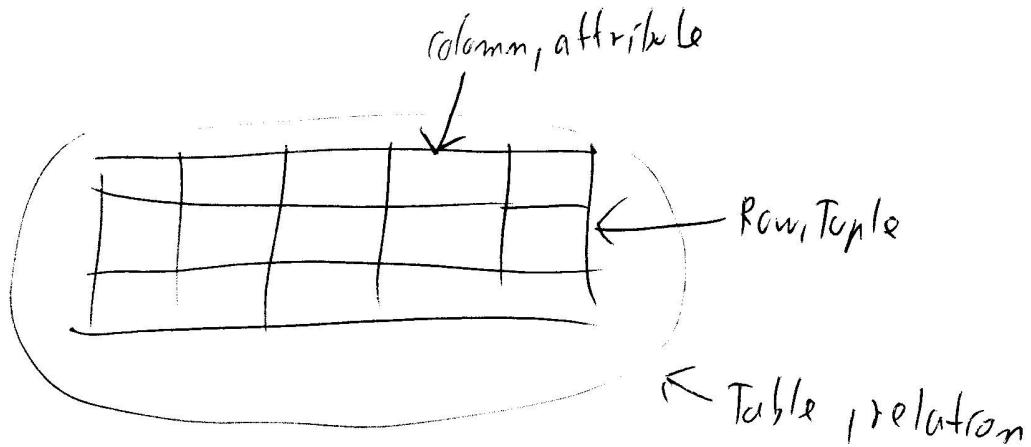
c) - relational database model

- object oriented database model
- relational oriented database model

W2

1

(2)  
a)



b) A Key is a unique value to identify any a Tuple with.  
The two main variants are the primary key and foreign key

c) The data type is the type of the data that can be entered in this attribute.

Ex: Boolean

The attribute domain are the accepted values that can be entered into the attribute.

For Boolean:

\* 1, 0, True, False

d) Projection:

SELECT name  
FROM sometable

Selection:

SELECT \*  
FROM sometable  
WHERE id = 4

Joining:

SELECT \*  
FROM sometable  
NATURAL JOIN someothertable

W2  
Z

(3)

- a) Set of agreements in which format data is stored and how it is build. ~~Both technical and political~~  
Both technical and political

b) - The user

- The provider of data
- The Web catalog service

c) - Web map service: provides images

- Web feature service: provides vector data / features
- Web coverage service: provides raster data / cells

d) de facto standard: standard from use / praxis

de jure standard: standard defined by institutions

e) Metadata in a SDI is the data which person/company provides which data and how to request it.

It's published on the Web catalog service

f) By checking the data by requesting GetCapabilities.

: Also in the WSDL

(4)

CREATE TABLE room(

building VARCHAR(3),

level integer

room-number Integer

shape geometry

windows integer

energy-consumption real

PRIMARY KEY(building, room-number)

W2

3

b) ALTER TABLE room

ADD CONSTRAINT room CHECK(windows  $\geq 0$ )~~AND windows >= 0~~

ADD CONSTRAINT room CHECK(level  $\geq 0$  AND level  $\leq 9$ )

c) SELECT building, room-number, ST\_area(shape) AS area  
FROM room  
ORDER BY building, room-number ASC

d) SELECT building, SUM(window)  
FROM room  
GROUP BY building

e) SELECT building, SUM(energy-consumption / ST\_area(shape))  
FROM room  
GROUP BY building

f) SELECT ST\_perimeter(ST\_union(shape))  
FROM room  
GROUP BY ~~level~~ building, level

g) smallest

SELECT room-number

FROM room

ORDER BY ST\_area(shape) ASC  
LIMIT 1

← change to DESC  
for the biggest room

(5)

a) 6 rows

b) SELECT \* FROM students,lecture WHERE lecture = lectureId

c)

id	name	lecture	lectureId	lecture	credits
10	Adele	789	789	Forensics	30
20	Bob	123	123	riminology	20
30	Oliver	123	123	criminology	20

d) - For a natural join to work the name of the attribute lectureId should be changed to lecture or vice versa.

SELECT \*

FROM students, ~~lecture~~

NATURAL JOIN lecture

- The resulting table has one <sup>column</sup> ~~row~~ less. The columns named lectureId yet merged in the scenario, because they are equal.

(6)

a)  $\pi_{c.name, SUM(p.geom)}$ 

FROM population p, city c

WHERE ST\_contains(c.geom, p.geom)

GROUP BY c.name

W2

5

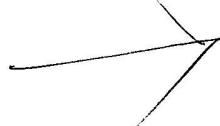
b) highways      country  
  name            name

SELECT DISTINCT h.name  
FROM highways h, country c  
WHERE ST\_touches(h.geom, c.geom)

- (7) a) - To have a formal description over the relationship from two geometric objects.  
b) By checking the intersection of all both interior boundaries and exterior, for all combinations from both objects  
c) - Touches

$$A \begin{bmatrix} 1 & -1 & 1 \\ -1 & -1 & 0 \\ 1 & 0 & 2 \end{bmatrix}$$

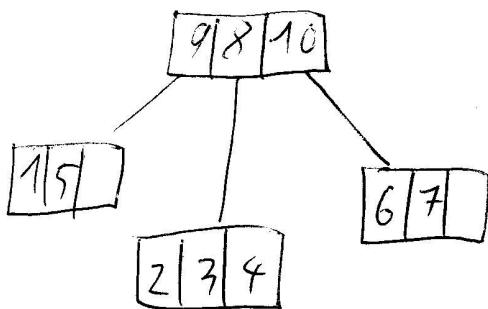
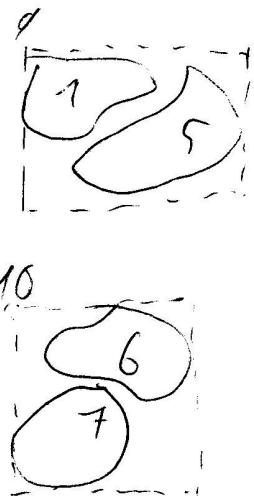
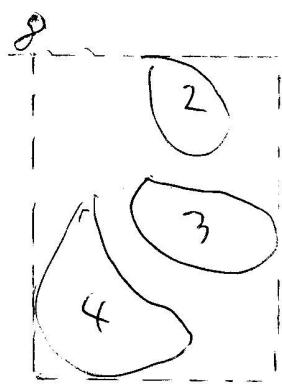
(8)  
a)



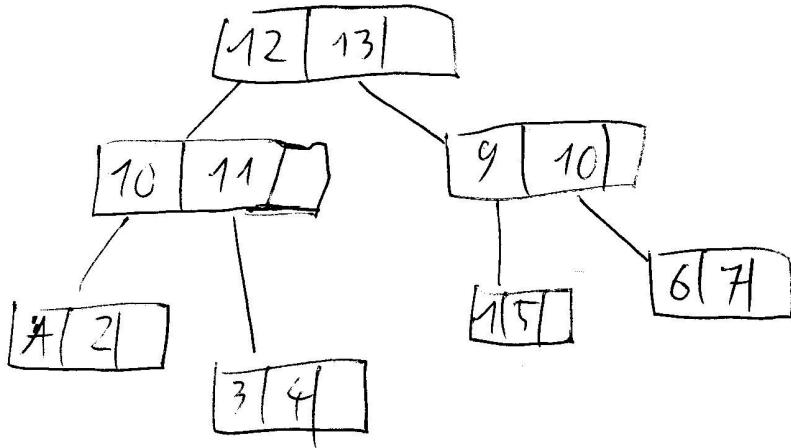
w2  
6

$$8 \quad m=2 \quad M=3$$

a)



b) The tree over fours



c) - starting by the root check the point lays in any Bounding box.

- When yes traverse further to the children and test the no if again (recursively)

- All bounding boxes that are leaves are now potential candidates.

w2

7

- d) - The ~~new~~ purpose of the filter step is to find possible candidates without checking every bounding box  
- The refine step is necessary if the point really lays in the polygon and not only in the bounding box (dead space)

(9). a) ~~divide~~  
~~refine~~ ~~thin~~

CREATE TABLE zwise (

rid Integer PRIMARY KEY

...

)<sub>r</sub>

CREATE TABLE portofcall (

norid Integer PRIMARY KEY

...

)<sub>p</sub>

CREATE TABLE ancor (

rid Integer

norid Integer

FOREIGN KEY (norid) REFERENCES portofcall(nocid)

FOREIGN KEY (rid) REFERENCES zwise(rid)

ON DELETE SET NULL

w<sub>2</sub>

8

b) - The general difference is that the 'parts' from the aggregation can exist without the 'whole'. It's independent.

In a composition all 'parts' gets also deleted when the 'whole' is deleted.

- The change in the mapping should be that instead of set NULL at the foreign key had delete on cascade.

### c) Split table approach:

~~CREATE TABLE pet(~~  
~~age integer~~  
~~PRIMARY KEY(age, weight, name)~~  
);

~~(CREATE TABLE pet(~~  
~~pet\_id integer~~  
~~PRIMARY KEY~~  
~~..... integer~~  
);  
;

~~(CREATE TABLE bird(~~  
~~.....~~  
~~pet\_id integer~~  
~~FOREIGN KEY (pet\_id)~~  
~~REFERENCES pet(pet\_id)~~  
);

~~(CREATE TABLE Dog(~~  
.....

~~pet\_id integer~~  
~~FOREIGN KEY (pet\_id) REFERENCES pet(pet\_id)~~



W2  
9

## Combined approach:

```
CREATE TABLE pet (
    age integer
    ...
    feathercolor VARCHAR(20) DEFAULT NULL
    canfly boolean DEFAULT 'false'
    loudness integer DEFAULT NULL
    taxnumber integer DEFAULT NULL
    PRIMARY KEY ());

```

### d) for the split approach =

~~SELECT  
FROM pet n1 dog g  
WHERE p.p~~

~~SELECT n.name, g.taxnumber  
FROM pet n2  
NATURAL JOIN dog g~~

### Combined approach:

~~SELECT p.name, fax~~

I can't read \* :)



d) split approach:

```
SELECT p.name  
FROM ref p NATURAL JOIN dog d  
WHERE d.taxnumber = XXXX
```

combined approach:

```
SELECT name  
FROM ref  
WHERE taxnumber = XXXX
```

- 
- finished 18 minutes early
  - should be possible to pass