

# DATABASE MODELS

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# Summary

- What is a database?
- What is a database model?
- Most common database models

# What is a database?

- We could call database anything what has data
  - But data without any order is useless
- Example of simple database: text file score.txt where e.g. columns are splitted by tabulators, rows by new lines

```
Petr      134
Aneta     145
Tomáš     33
```

- *Answer #1: data with some order*

# What is a database?

- What if I want to change Peters score?
  - I have to write a piece of code for that.
    - It is uncomfortable to do that for every action i need.
    - There is a fair chance that I make a mistake and destroy some data.
  - ... or I can use smarter database
    - UPDATE score SET value=146 WHERE name= ' Petr '
- *Answer #2: data with some order and manipulation interface (language)*

# What is a {transactional} database?

- A – Atomicity
- C – Consistency
- I – Isolation (Independency)
- D – Durability

- MySQL is **NOT** transactional database when using default MyISAM engine. Use InnoDB engine if safe database needed (or Oracle).
- *Answer #3: database machine with ACID support*

# What is a database model?

- Two just mentioned things:
  - It defines how the data will be structured and
  - operations that can be performed on the data

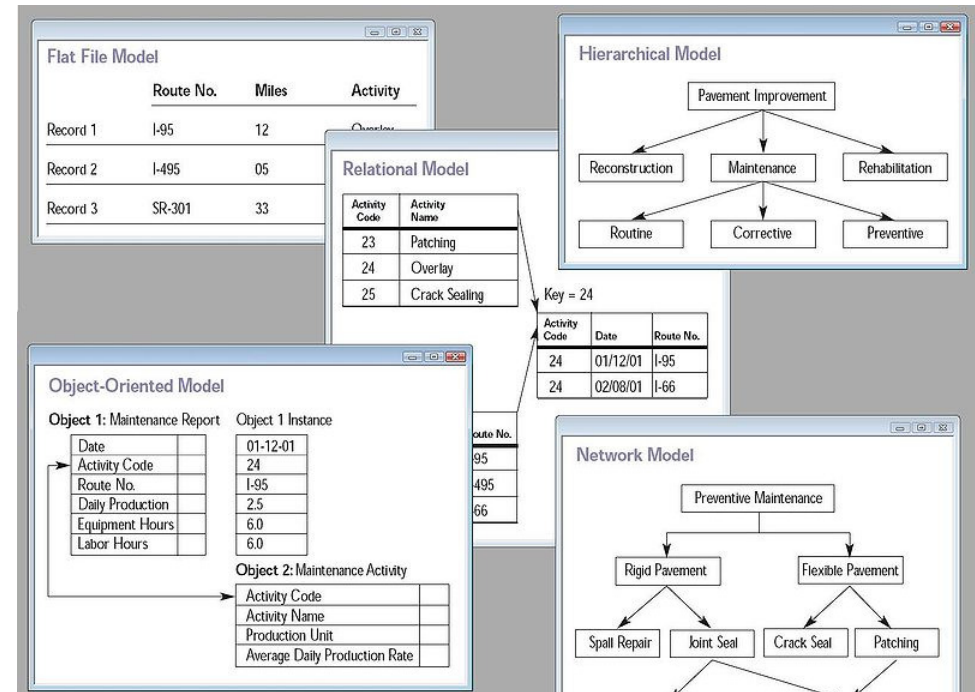
• The example with scores was so called flat model





# Most common DB models

- *Flat model (txt)*
- *Hierarchical model (xml)*
- *Network model*
- *Relational model (mysql)*
- *Object(-relational) model (Oracle)*





# Most common DB models

## Flat model

	<b>Route No.</b>	<b>Miles</b>	<b>Activity</b>
<b>Record 1</b>	<b>I-95</b>	<b>12</b>	<b>Overlay</b>
<b>Record 2</b>	<b>I-495</b>	<b>05</b>	<b>Patching</b>
<b>Record 3</b>	<b>SR-901</b>	<b>33</b>	<b>Crack seal</b>

- *Also called table model*
- *All members of a given column are assumed to be similar values*
- *All members of a row are assumed to be related to one another*



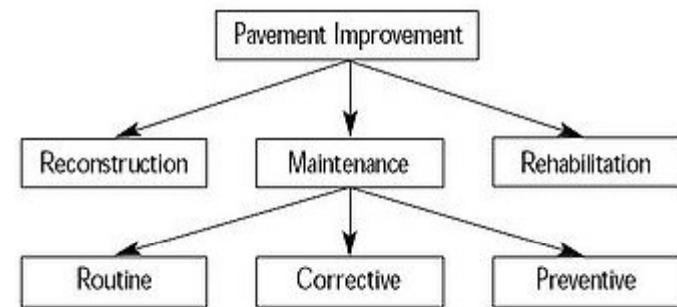




# Most common DB models

## Hierarchical model

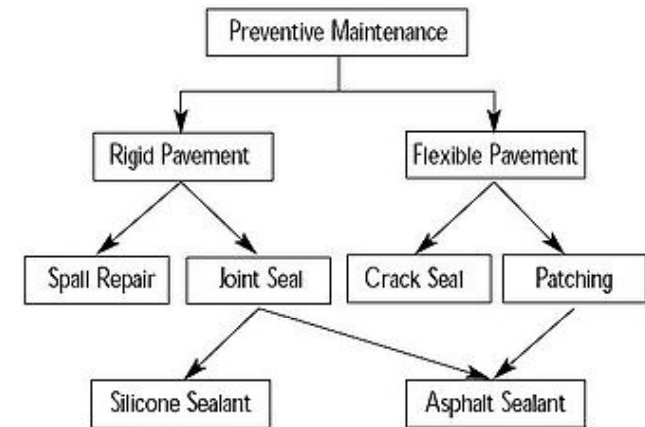
- *Tree structure*
- *Allows only 1:N relations*
- *XML files have the same structure*
- *Widely used in the early mainframe database management systems*





# Most common DB models

## Network model



- There are records and sets
- Records have data
- Sets define one-to-many relationships between records
- Little bit upgraded hierarchical model

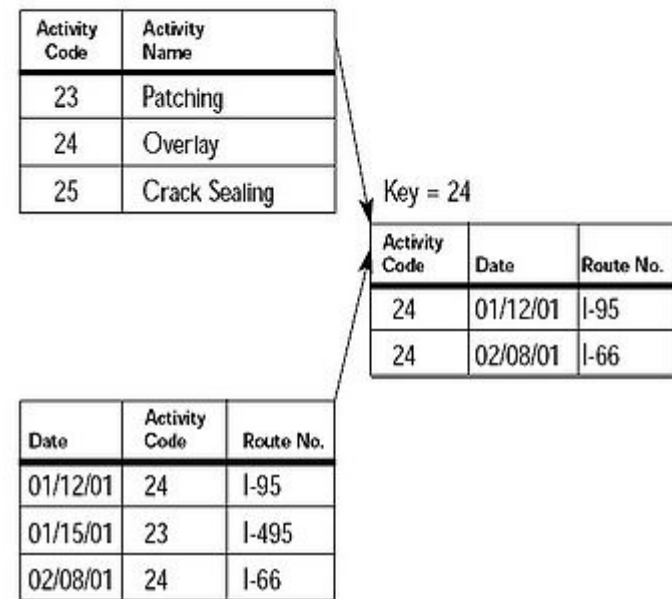




# Most common DB models

## Relational model

- Relations, attributes, and domains!
- It has a mathematical model defined in terms of predicate logic and set theory on background – as you could / will see on Y36DBS

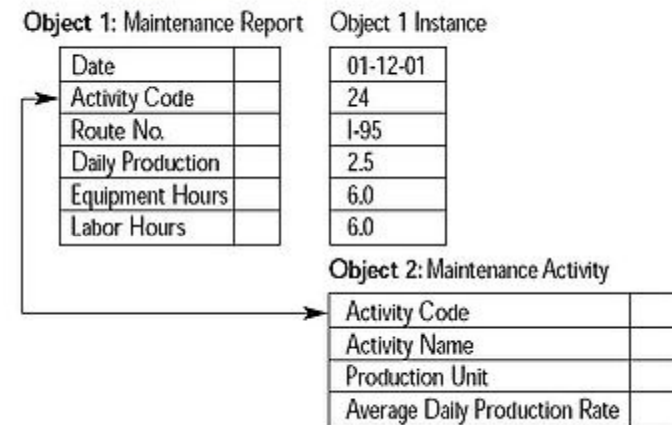




# Most common DB models

## *Object(-relational) model*

- Attempt to unify the view on data on both side: application (objects) and database (rows)
- Pure objectional database models are not commercially successful
- Relational database vendors adapted some of the aspects of objectional model



That's It!

Thank you for your attention.

Do you have some questions?

