

# Soil

**An object oriented database for  
fun and profit**

*"I didn't choose the database life,  
the database life chose me"*

*"Imagine there would be memory that  
is non-volatile, fast AND cheap."*



*"A database should be a library"*



# How it started: 40 years of databases





# Where it went

|        |                             |
|--------|-----------------------------|
| 1995   | msql                        |
| -      | mySQL, oracle, postgres,... |
| 2005   | GOODS, magma, Glorp         |
| 201X ? | MongoDB + voyage            |
| 2022   | Soil                        |

# Quick comparison

|  | MongoDB | Postgres | Sqlite | Soil |
|--|---------|----------|--------|------|
|  |         |          |        |      |
|  |         |          |        |      |
|  |         |          |        |      |

# Quick comparison

|                                   | MongoDB | Postgres | Sqlite | Soil   |
|-----------------------------------|---------|----------|--------|--------|
| Sends query and data over network | Yes (👎) | Yes (👎)  | No (👍) | No (👍) |
|                                   |         |          |        |        |
|                                   |         |          |        |        |



# Quick comparison

|                                   | MongoDB        | Postgres | Sqlite  | Soil             |
|-----------------------------------|----------------|----------|---------|------------------|
| Sends query and data over network | Yes (👎)        | Yes (👎)  | No (👍)  | No (👍)           |
| Query language                    | JSON QL<br>(👎) | SQL (👎)  | SQL (👎) | Smalltalk<br>(💪) |
|                                   |                |          |         |                  |

# Quick comparison

|                                   | MongoDB     | Postgres | Sqlite  | Soil          |
|-----------------------------------|-------------|----------|---------|---------------|
| Sends query and data over network | Yes (👎)     | Yes (👎)  | No (👍)  | No (👍)        |
| Query language                    | JSON QL (👎) | SQL (👎)  | SQL (👎) | Smalltalk (👊) |
| Fun                               | ✗           | ✗        | ✗       | ✓             |

# What does it support?

- ACID transactions
- MVCC (multi version concurrency control)
- Binary search indexes (skip list, BTree)
- Object segments



# ACID transactions

```
txn := soil newTransaction.  
txn root: Dictionary new.  
txn commit
```

```
norbert$ ls -sl smalltalks/journal/  
8 -rw-r--r--@ 1 norbert  staff  213 14 Nov 08:38 000000000000
```

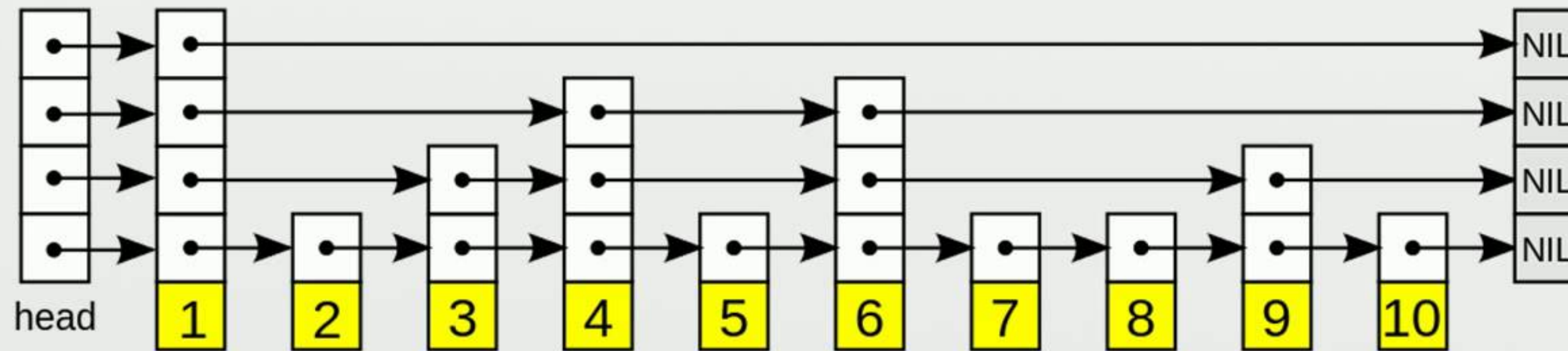


# MVCC - multi version concurrency control

- write new record for every change
- Isolates transactions
- allows to do time travel

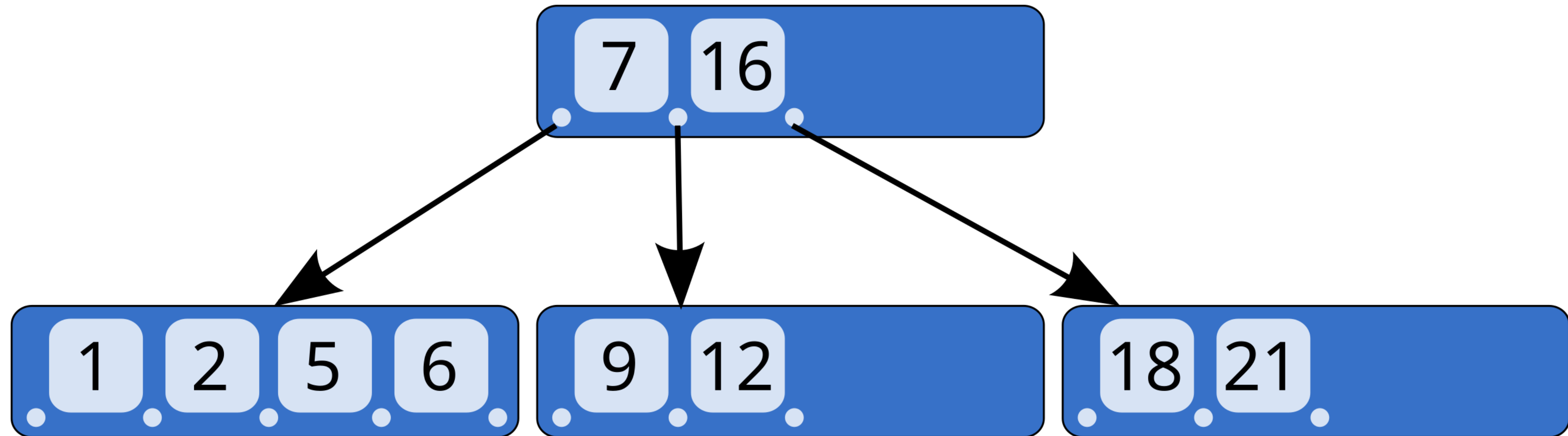
## Indexes: Skip list

# Skip list



[https://en.wikipedia.org/wiki/File:Skip\\_list.svg](https://en.wikipedia.org/wiki/File:Skip_list.svg)

# Indexes: BTree+





Demo time

# What it needs to be added

- Remove index keys (while maintaining indexes)
- multi-index collections
- query planning
- garbage collection



thank you!

Questions?



**ApptiveGrid**

Norbert Hartl  
norbert@apptivegrid.de