



# Flyway

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# Agenda

**1 - Introduction**



**2 - Theory**



**3 - Kahoot**



**4 - Demo**

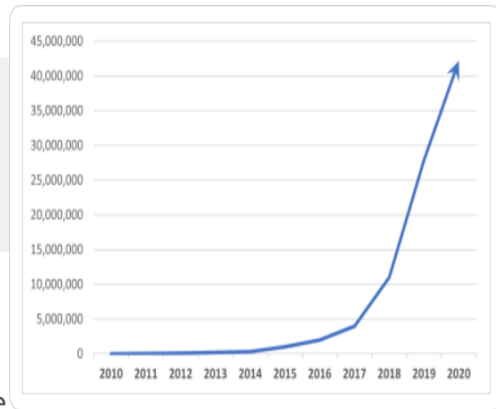


# Flyway

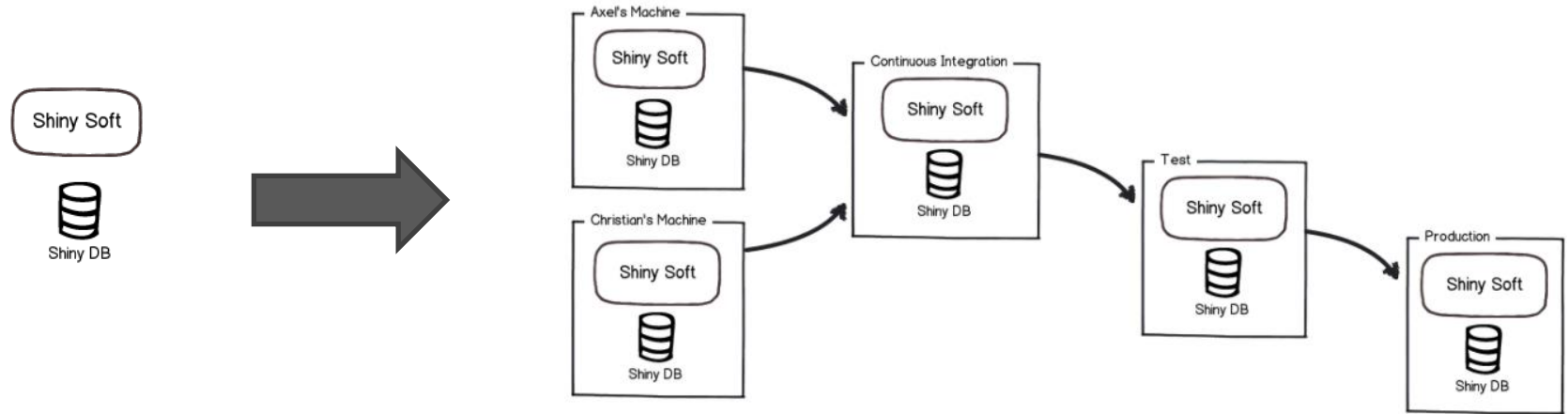
**40,000,000**  
downloads in 2020

- An open-source tool, licenced under Apache License 2.0
- Originally developed by Boxfuse and later on, it was taken over by Redgate
- Helps implement automated & version-based migrations
- It is based around just 7 basic commands:

Migrate, Clean, Info, Validate, Undo, Baseline and Repair



# Why use database migration?





# What Flyway does

- Keeps track of applied migrations
- Checks available migrations
- Checks for existing migrations that weren't applied yet



# How is flyway going to apply those migrations

- It checks what migrations are available
  - How?
- Checks if flyway has been used before
  - `SCHEMA_VERSION`



# Validations

- Used to prevent failed migrations
1. Is this an empty database schema?
  2. Do checksums match?
  3. Are there any unknown applied migrations?
  4. New migrations have a higher version number than the last applied migration?



# Migrations

- With flyway, all changes made to the Db are called migrations
- Migration – file containing a bunch of SQL statements
- There are 2 types of migrations
  - Versioned migrations(regular and undo)
  - Repeatable migration





# Versioned migrations

- The most common type of migration
- They are applied only once
- Have a version, a description and a checksum
- Typically used for:
  - Creating/altering/dropping tables/indexes/foreign keys/enums
  - Reference data updates
  - User data corrections

```
CREATE TABLE car (  
    id INT NOT NULL PRIMARY KEY,  
    license_plate VARCHAR NOT NULL,  
    color VARCHAR NOT NULL  
);  
  
ALTER TABLE owner ADD driver_license_id VARCHAR;  
  
INSERT INTO brand (name) VALUES ('DeLorean');
```



# Undo migrations

- The opposite of regular versioned migrations
- Responsible for undoing effects of the versioned migration



# Repeatable migrations

```
CREATE OR REPLACE VIEW blue_cars AS  
SELECT id, license_plate FROM cars WHERE color='blue';
```

- They are re-applied every time their checksum changes
- Have a description and a checksum
- Typically used for:
  - (Re-)creating views/procedures/functions
  - Bulk reference data reinserts



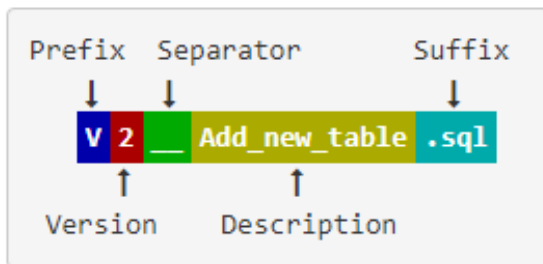
# SQL-based migrations

- Migrations are most commonly written in SQL
- Easy to get started
- Typically used for:
  - DDL changes
  - Simple reference data changes
  - Simple bulk data changes

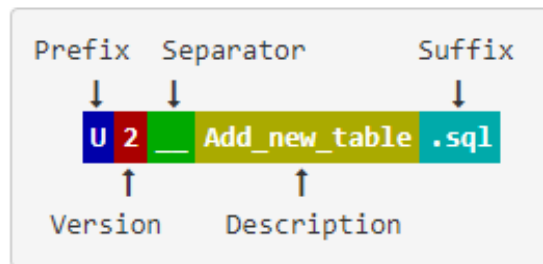
# SQL-based migrations

- Naming

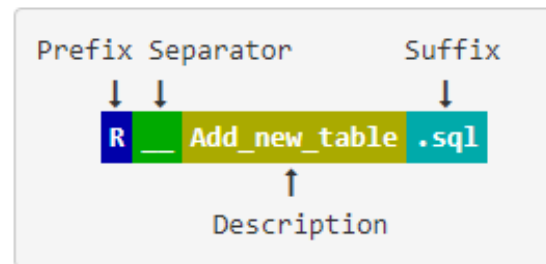
## Versioned Migrations



## Undo Migrations

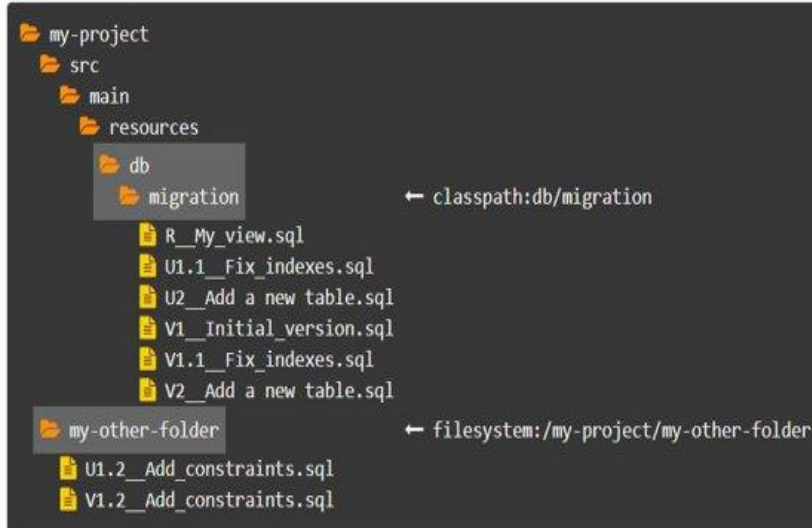


## Repeatable Migrations



# Java-based migrations

- Great fit for the changes which are hard to express using SQL
  - BLOB changes
  - Advanced bulk data changes
- Naming







DEMO