Introduction to MySQL

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Coalition for Queens

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Goals

- Understand what MySQL is
- Write and execute queries
- Understand a database schema
- Design a MySQL database
- Analyze queries for performance

What is MySQL

- Open source

The world's most popular open source database

  - Anyone can contribute to it
    - Free (thus world's most popular!)
- Database
  - Store data in an organized way

Relational databases

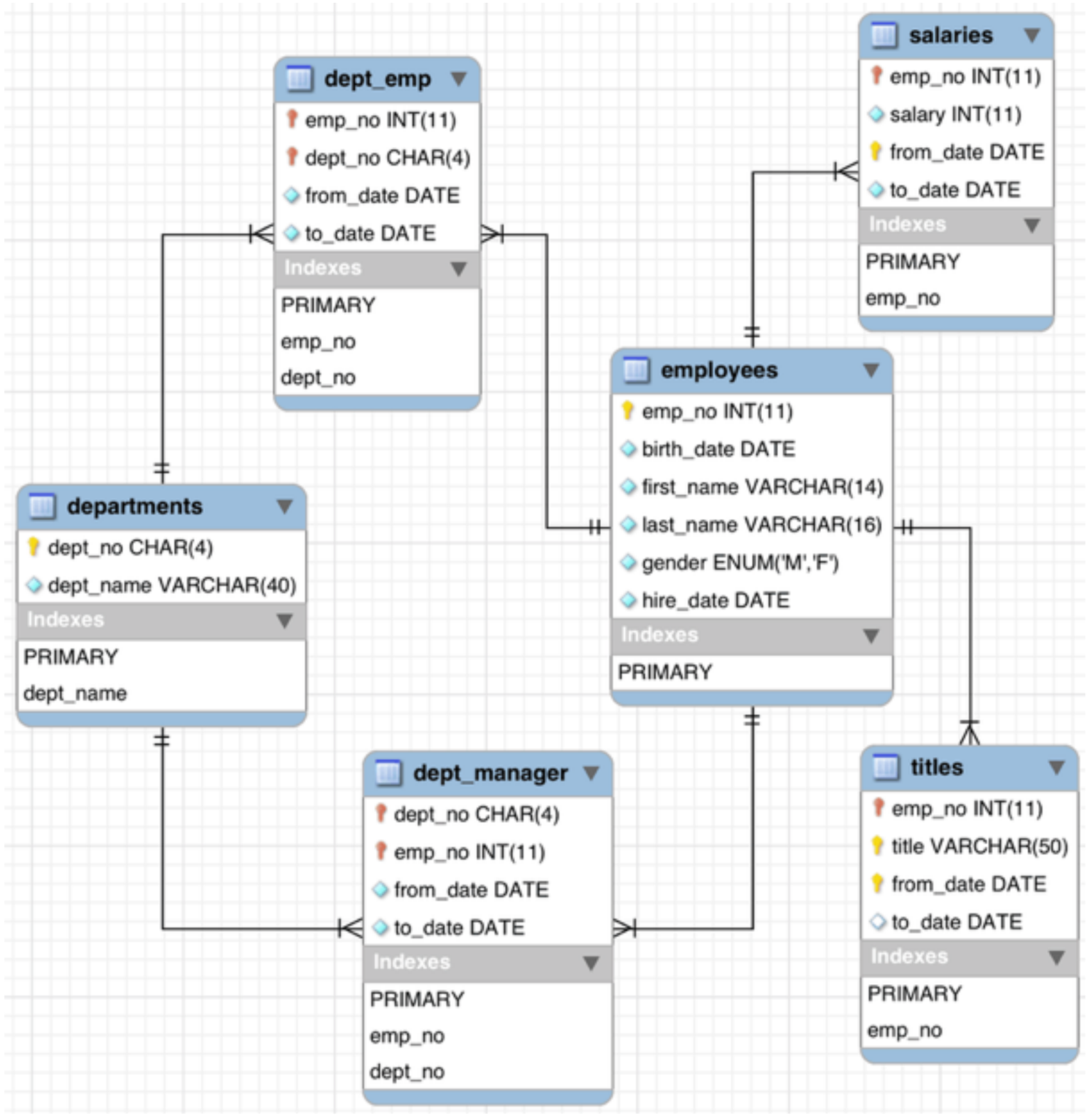
- Set of tables
- A table consists of columns and rows
- Each column has a name and a type
- Each row is called a record
- Records in one table can refer to records in other tables (the relational)
- Interact with a database using queries

products

id	category_id	name	color	price
1	1	Widget 1	ORANGE	100.00
2	1	Widget 2	RED	200.00
3	2	Widget 3	BLUE	150.00
4	3	Widget 4	GREEN	125.00

categories

id	name
1	Shirt
2	Pants
3	Hat


dept_emp
emp_no INT(11)
dept_no CHAR(4)
from_date DATE
to_date DATE
Indexes
PRIMARY
emp_no
dept_no
salaries
emp_no INT(11)
salary INT(11)
from_date DATE
to_date DATE
Indexes
PRIMARY
emp_no
employees
emp_no INT(11)
birth_date DATE
first_name VARCHAR(14)
last_name VARCHAR(16)
gender ENUM('M','F')
hire_date DATE
Indexes
PRIMARY
departments
dept_no CHAR(4)
dept_name VARCHAR(40)
Indexes
PRIMARY
dept_name
dept_manager
dept_no CHAR(4)
emp_no INT(11)
from_date DATE
to_date DATE
Indexes
PRIMARY
emp_no
dept_no
titles
emp_no INT(11)
title VARCHAR(50)
from_date DATE
to_date DATE
Indexes
PRIMARY
emp_no

Why is it useful?

- Represent structured data and the relationships
- Used by software applications
- Enforce database constraints
- Handle huge amounts of data
- Handle complicated queries
- Robust, industry-tested and proven
    - Used by Facebook, LinkedIn, Google, Twitter

Column types

Type	Description
tinyint	-128 -> 127
int	-2^31 -> 2^31 - 1
bigint	-2^63 -> 2^63 - 1
float	4 “bytes”
double	8 “bytes”
date	“2014-10-02”
time	“07:42:00 PM”
datetime	“2014-10-02 07:42:00 PM”
varchar	“Learning MySQL”
text	“More MySQL learning”

Our dataset

- Fantasy football data for the 2014-2015 season
    - Retrieved from Yahoo
    - Offensive projections by player and week (first 10 pages)
- Tables
    - teams
    - positions
    - players
    - schedule
    - stats

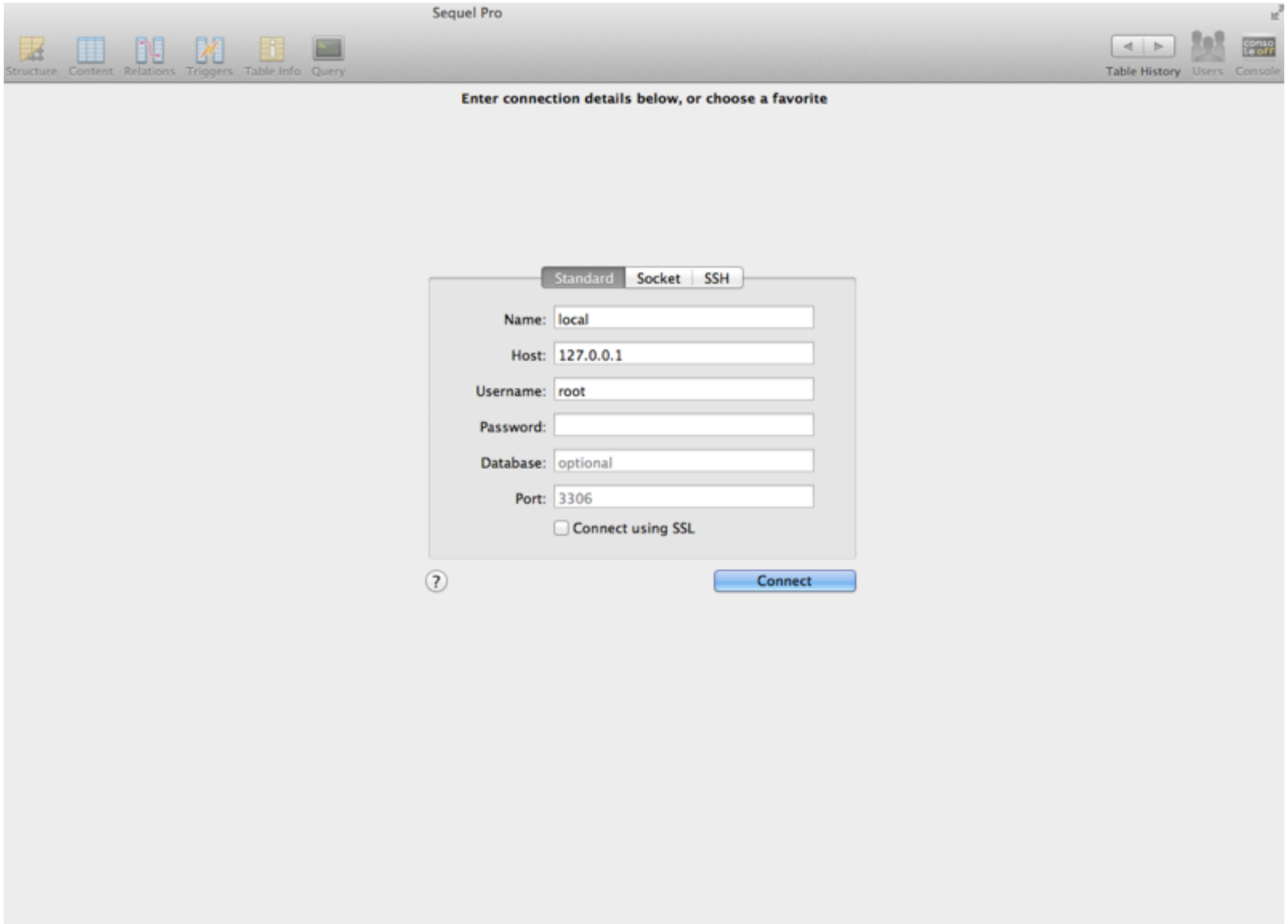
Tools

- MySQL
  - https://dev.mysql.com/downloads/mysql/
- MySQL client
  - Windows + OS X: MySQL Workbench:
    - https://dev.mysql.com/downloads/workbench/
  - OS X: Sequel Pro:
    - http://www.sequelpro.com/

Installation

- Install MySQL
- Optionally install a MySQL client
- Connect to the database
- Load our dataset

- https://github.com/dangoldin/mysql-class/blob/master/GETTING_STARTED.md


Sequel Pro
Structure
Content
Relations
Triggers
Table Info
Query
Table History
Users
Console
Enter connection details below, or choose a favorite
Standard
Socket
SSH
Name: local
Host: 127.0.0.1
Username: root
Password:
Database: optional
Port: 3306
Connect using SSL
Connect

What's a query?

- Way to ask the database to do something
  - SELECT
  - INSERT

The SELECT statement

- SELECT
  - SELECT * FROM teams;
  - SELECT * FROM teams WHERE id = 1;
  - SELECT * FROM players LIMIT 10;
  - SELECT * FROM players ORDER BY name desc;
  - SELECT * FROM players ORDER BY name desc LIMIT 10;

Let’s do some exercises

Class structure - Session I

- Overview and intro to MySQL and relational databases
- Introduce the dataset we'll be exploring
- Go over tools we'll be using
- Start writing some queries
    - Introduce the SELECT statement

Class structure - Session II

- Explore our dataset in more detail
- More query writing
    - The INSERT statement
    - GROUP BY statements

Class structure - Session III

- Introduce advanced queries
    - Introduce JOIN operations
    - Introduce table INDICES
- Explore our dataset using our new queries

Class structure - Session IV

- Discuss table design
- Create some tables
- Go over ways to analyze query performance
- Brief overview of the system tables