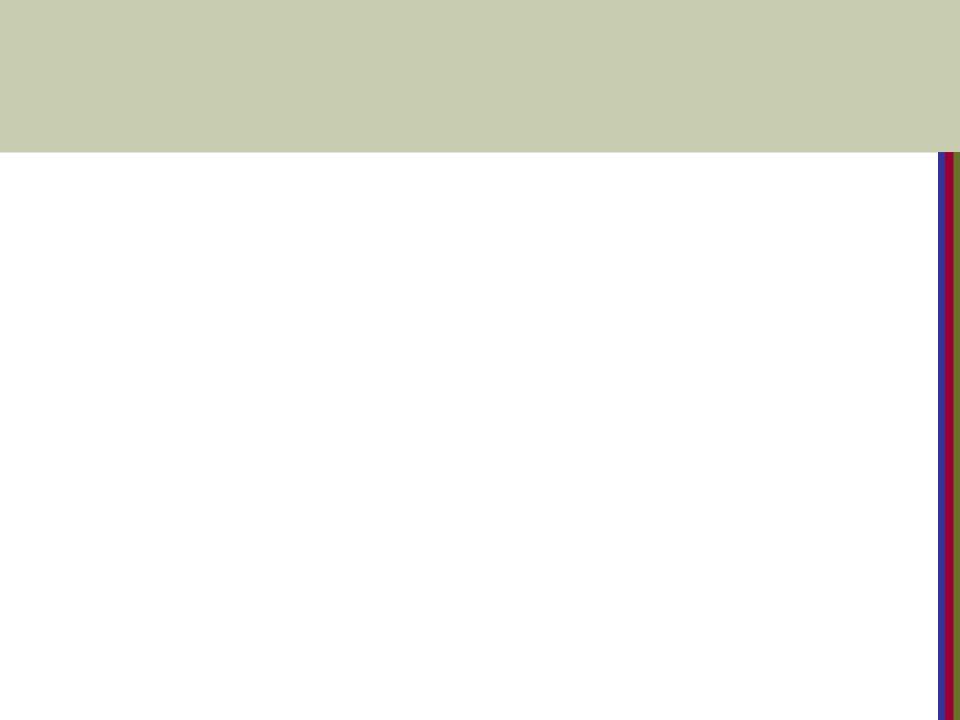
## DBMS – Big Picture

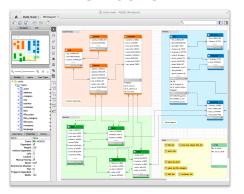
Khalid Mahmood Khalid.mahmood@it.uu.se

# Why Databases?





## MySQL workbench



# MySQL CLI (client)

```
MacIntosh HD — top — 80x24

Processes: 218 total, 2 running, 9 stuck, 199 steeping, 981 threads 23:38:83
Load Avg: 1.49, 1.75, 1.80 C FU usage: 4.15% user, 4.46% sys, 91.46% idle
Sharedibs: 1646% resident, 80 data, 88 linkedit.
Hemblegions: 3172 total; 1827% resident, 1717 private, 564M shared.

WH: 535 vsize, 1826M framework vsize, 8(6) swapins, 8(6) swapouts.
Networks: packets: 31268/8258 kin, 11987/1864 cut.

Disks: 88156/2269M read, 21235/425M written.

PID COMMAND XCPT ITIME #ITM #RMQ #PORT HEM PURG CMPR PGRP PPID

S29 screencaptur 8.8 88:80.80 2 7 5 55+ 19324/284+ 88 252 262
598 mborker 8.8 88:80.80 2 7 5 55+ 19324/284+ 88 252 262
598 mborker 9.8 88:80.80 2 7 5 55+ 19324/284+ 88 250 1
588 bash 6.8 88:80.80 1 1 9 44 2032X 88 88 580 1
584 bash 6.8 88:80 13 1 2 0 12-866% 88 88 584
584 bash 6.8 88:80 81 1/1 0 22-866% 88 88 584
585 steem of the state of the stat
```

#### **Python**

```
import mysql.connector

mydb = mysql.connector.connect(
   host="localhost",
   user="your_username",
   password="your_password",
   database="database_name"
)

mycursor = mydb.cursor()

mycursor.execute("SELECT * FROM students")

myresult = mycursor.fetchall()

for x in myresult:
   print(x)
```

#### Mobile App



# User / Application program

DBMS
(stores data)

```
import mysql.connector
mydb = mysql.connector.connect(
  host="localhost",
  user="your_username",
  password="your password",
  database="database name"
mycursor = mydb.cursor()
mycursor.execute("SELECT * FROM students")
myresult = mycursor.fetchall()
for x in myresult:
  print(x)
```

#### Python

```
import mysql.connector

mydb = mysql.connector.connect(
    host="localhost",
    user="your_username",
    password="your_password",
    database="database_name"
)

mycursor = mydb.cursor()

mycursor.execute("SELECT * FROM students")

myresult = mycursor.fetchall()

for x in myresult:
    print(x)
```

#### Mobile App



lication am

DBMS (stores data)

### Course Outline

#### Design

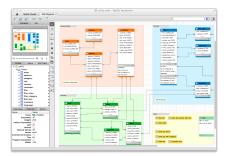


**Tool: erdplus.com** 

**Project: Milestone 1** 

Lectures: ER/EER Model, Normalization

## Relational DBMS Design

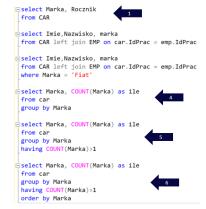


Tool: MySQL DB, MySQL workbench

**Project: Milestone 2** 

Lectures: Relational Model

SQL



Tool: MySQL DB, MySQL client/workbench

**Project: Milestone 3** 

Lectures: SQL, Transaction

SQL

#### DB Programming

```
import mysql.connector

mydb = mysql.connector.connect(
    host="localhost",
    user="your_username",
    password="your_password",
    database="database_name"
)

mycursor = mydb.cursor()

mycursor.execute("SELECT * FROM students")

myresult = mycursor.fetchall()

for x in myresult:
    print(x)
```

Tool: Java, Python, Java Script, etc

Project: Milestone Lectures: DB Programming

SQL

SQL (implicit)

MySQL DBMS (stores data)

- DBMS is widely used:
  - Web-design, ML, Data Science, Big data analytics
- SQL
  - Commonly used programming language
  - Not limited to DBMS only
- Concepts of DBMS is widely used in numerous data management systems