



# Introduction to MySQL

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Field Station Programs

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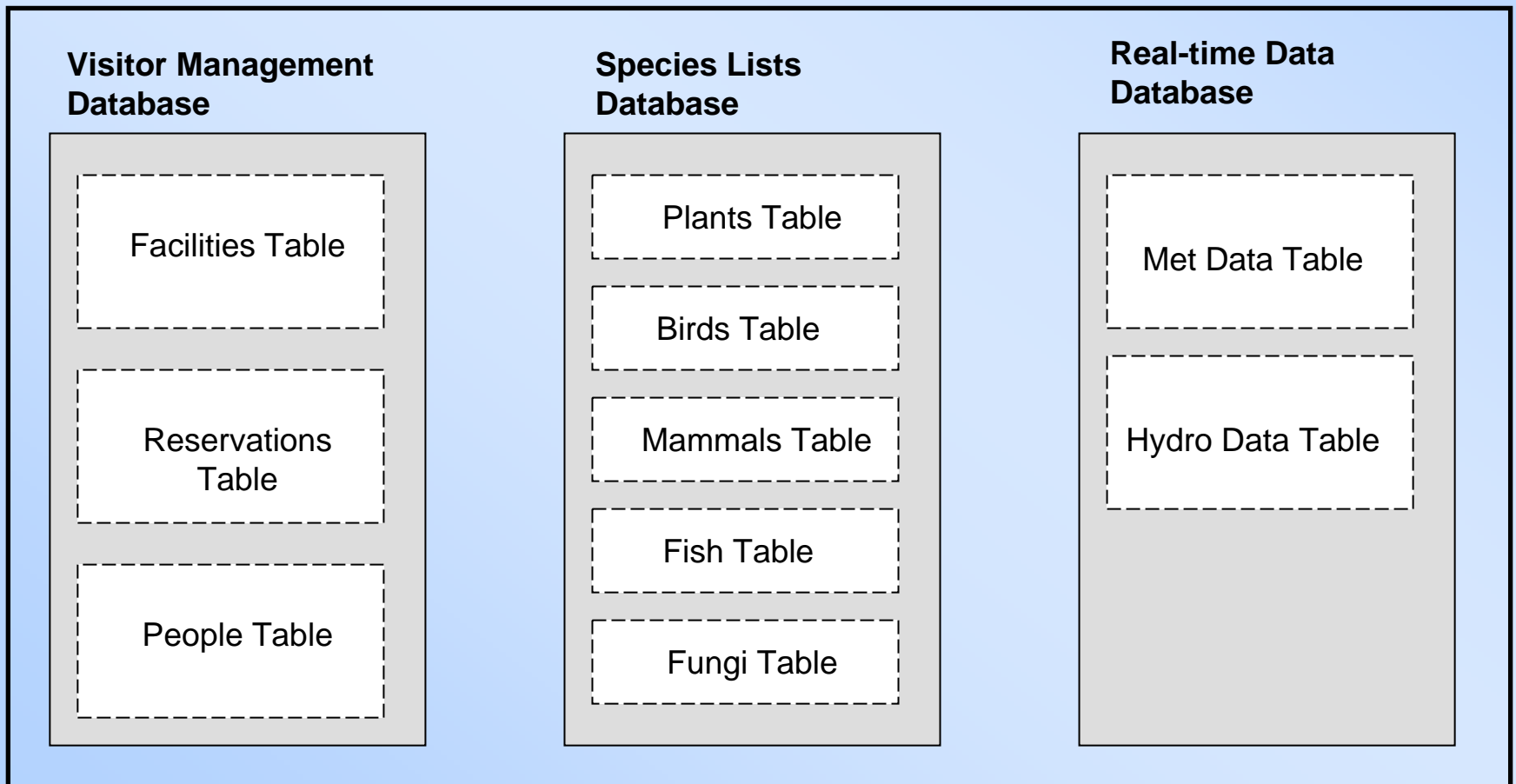
# What is MySQL?

- Popular SQL database software
- Industrial-strength but “Community Edition” is free
- New Version 5 has all features, e.g. :
  - transactions
  - stored procedures
- Only the database server
- Suite of client & administrative software



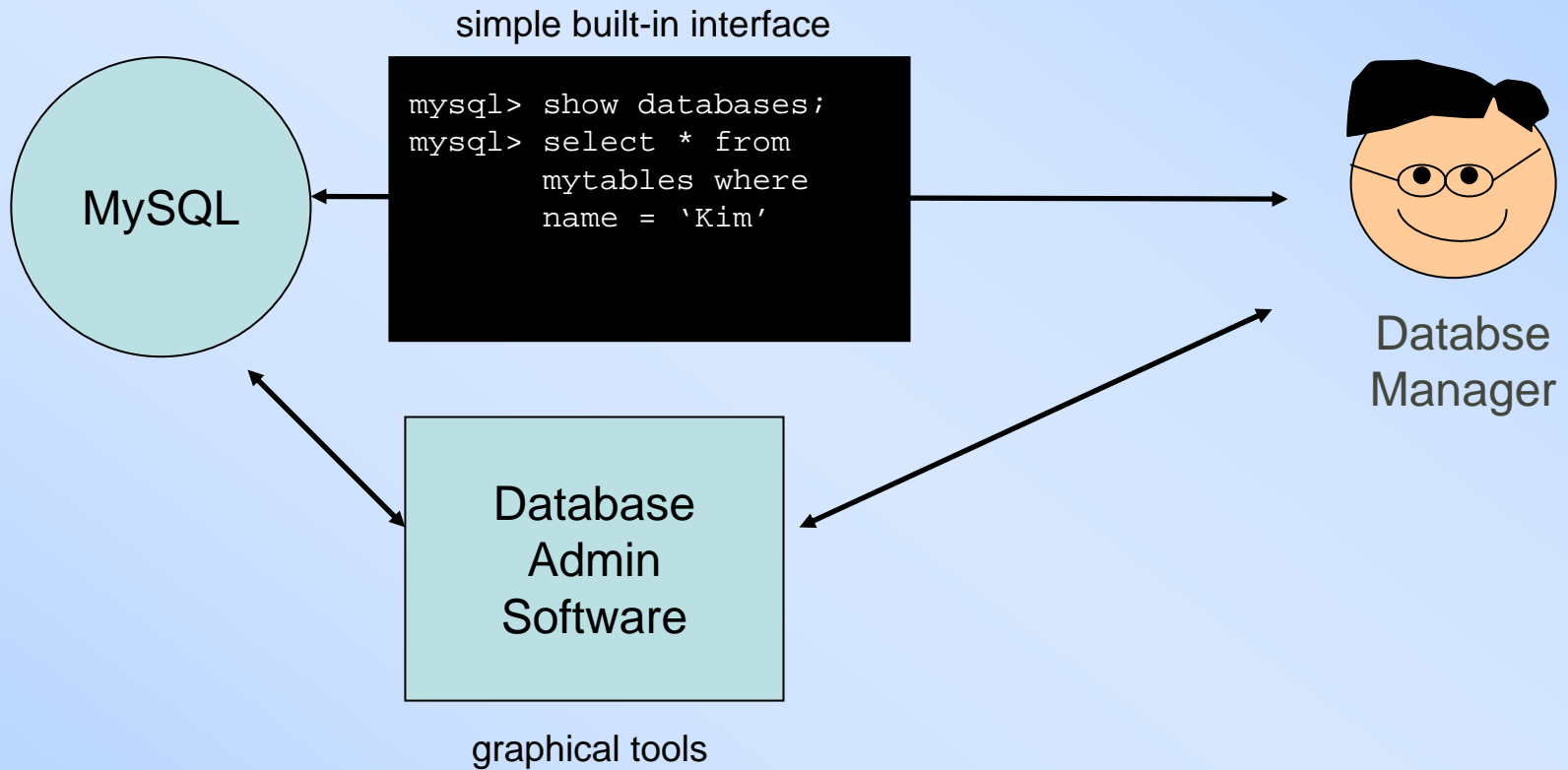
# Overall Organization of MySQL (by example)

## MySQL at SDSU Field Station Programs





# Server? What?

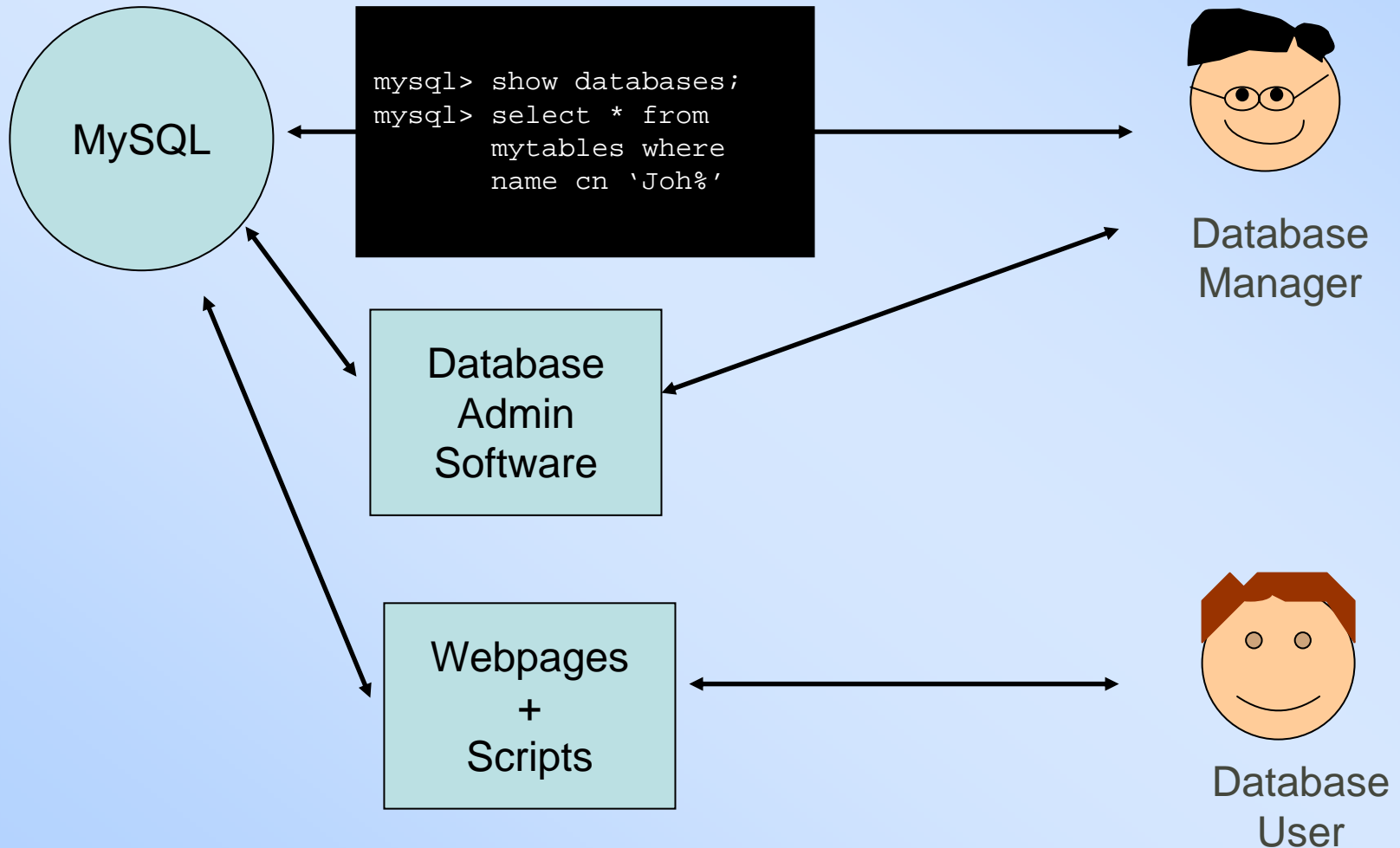


Two consequences:

1. Usually use tools
2. Interact remotely

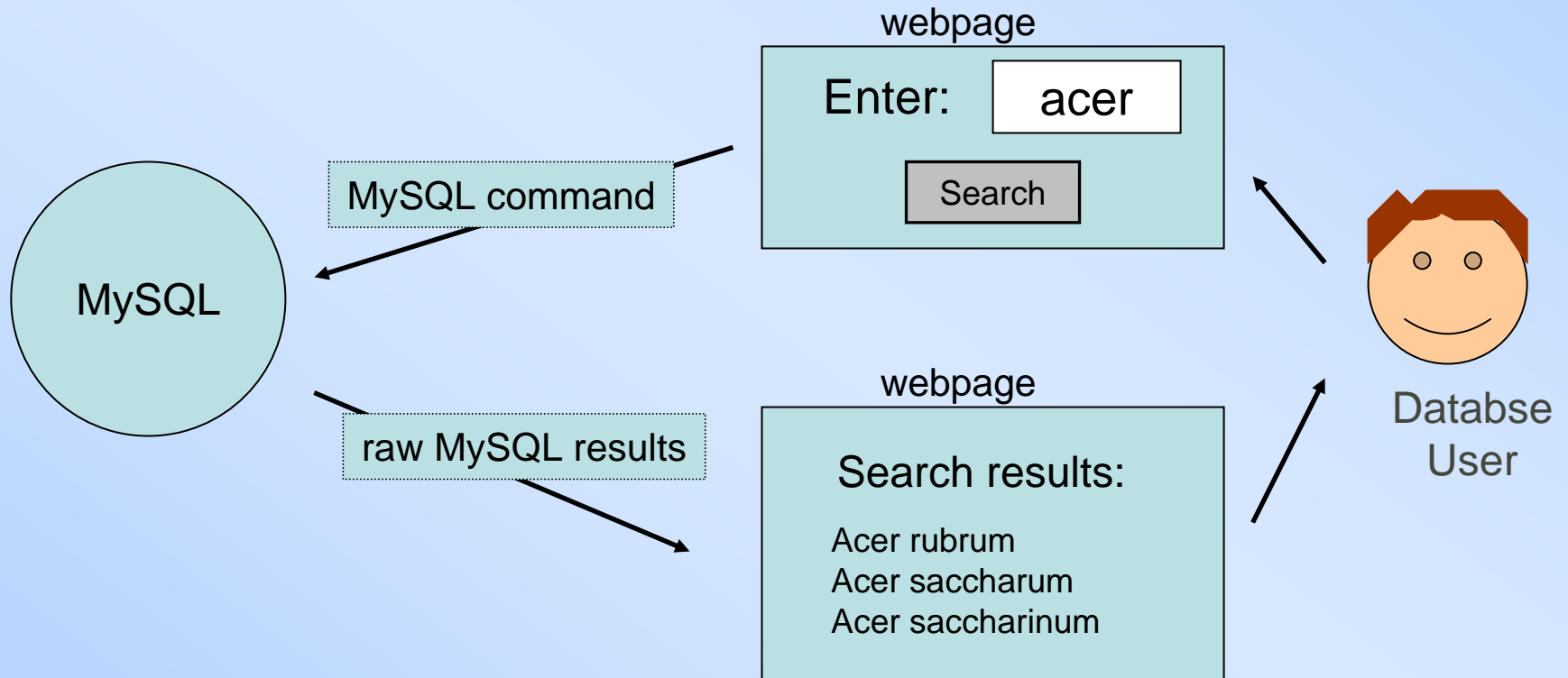


# What about displaying data?



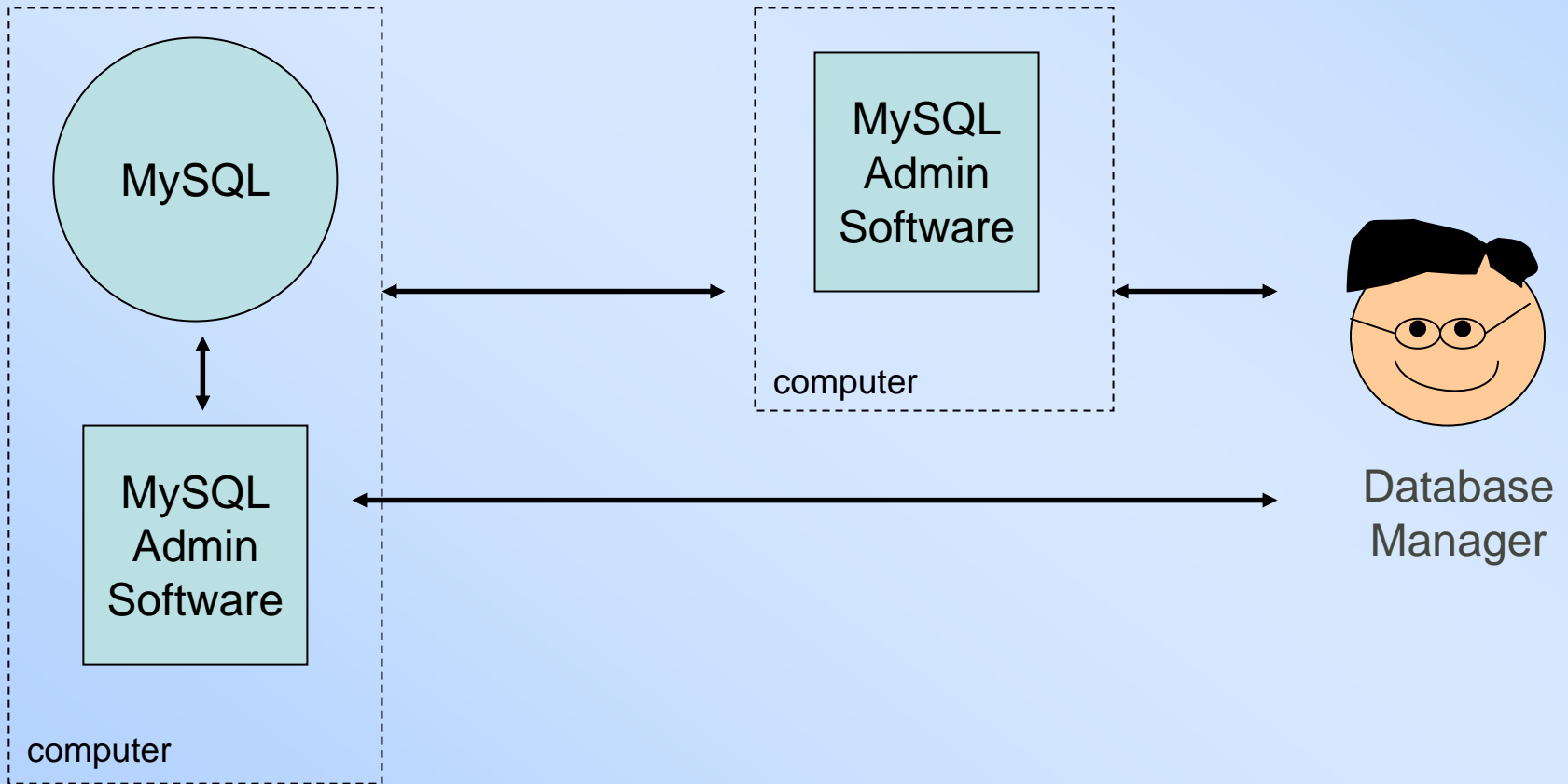


# Displaying data on Webpages



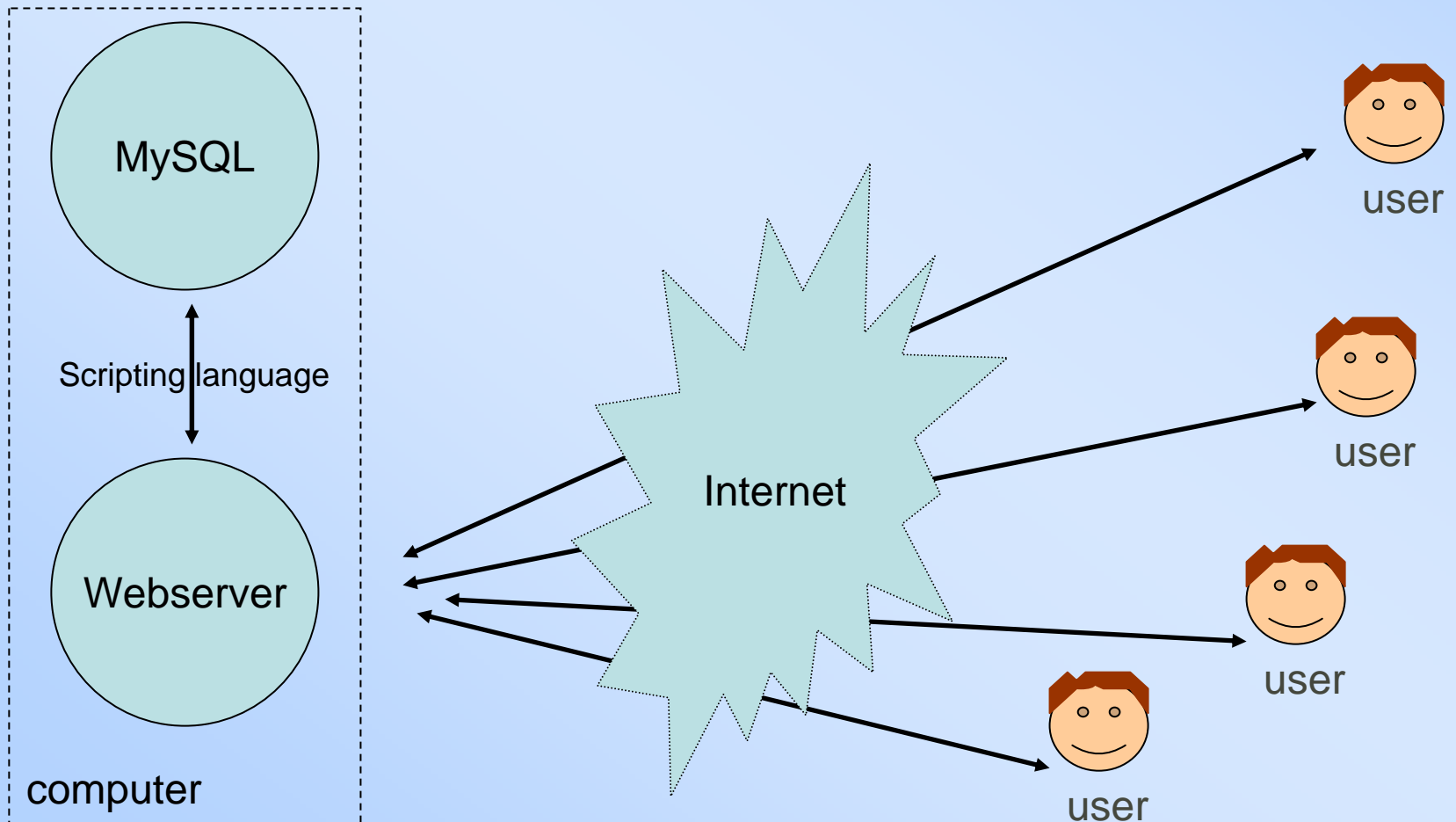


# System configuration for management





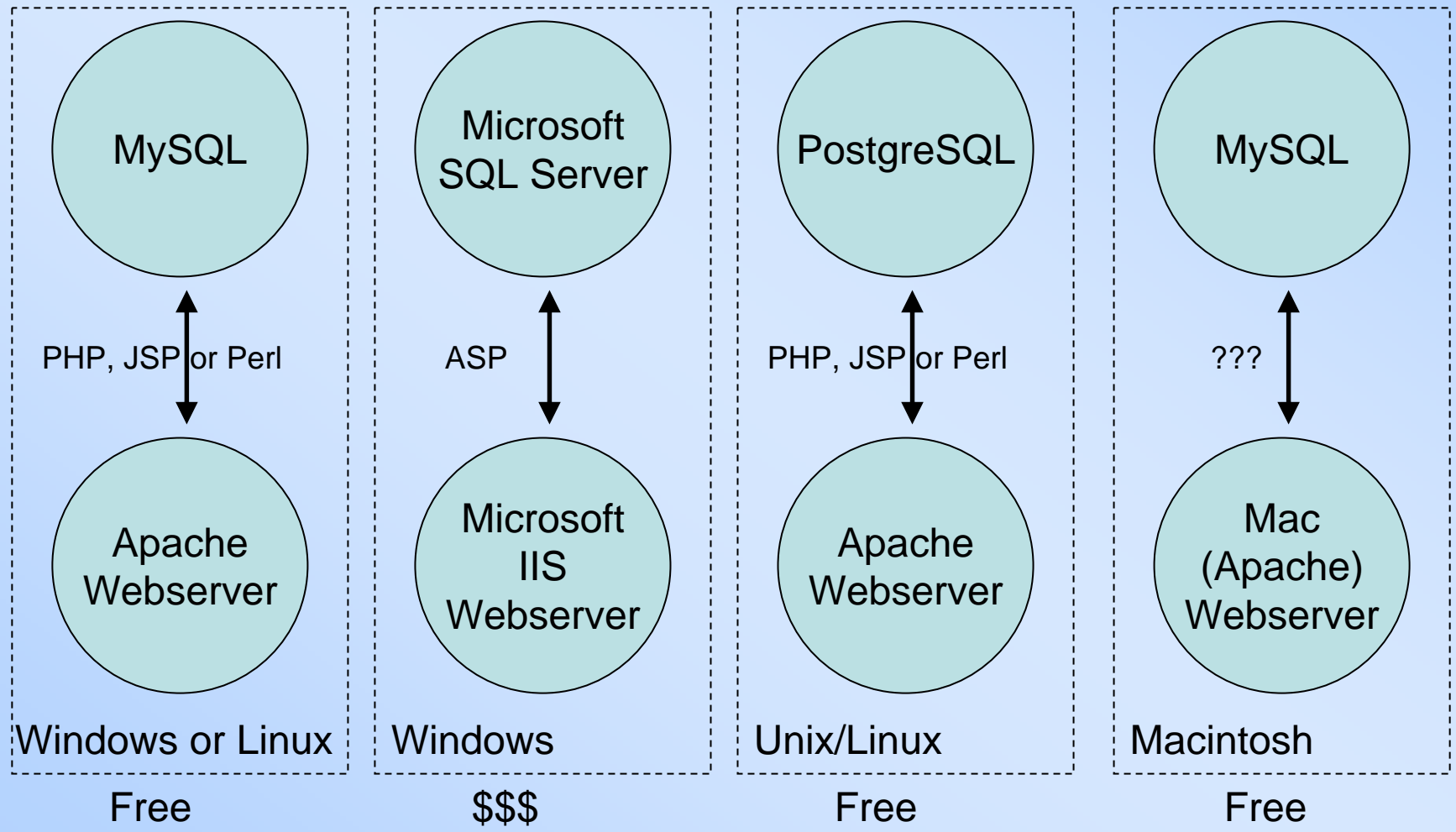
# System configuration for sharing





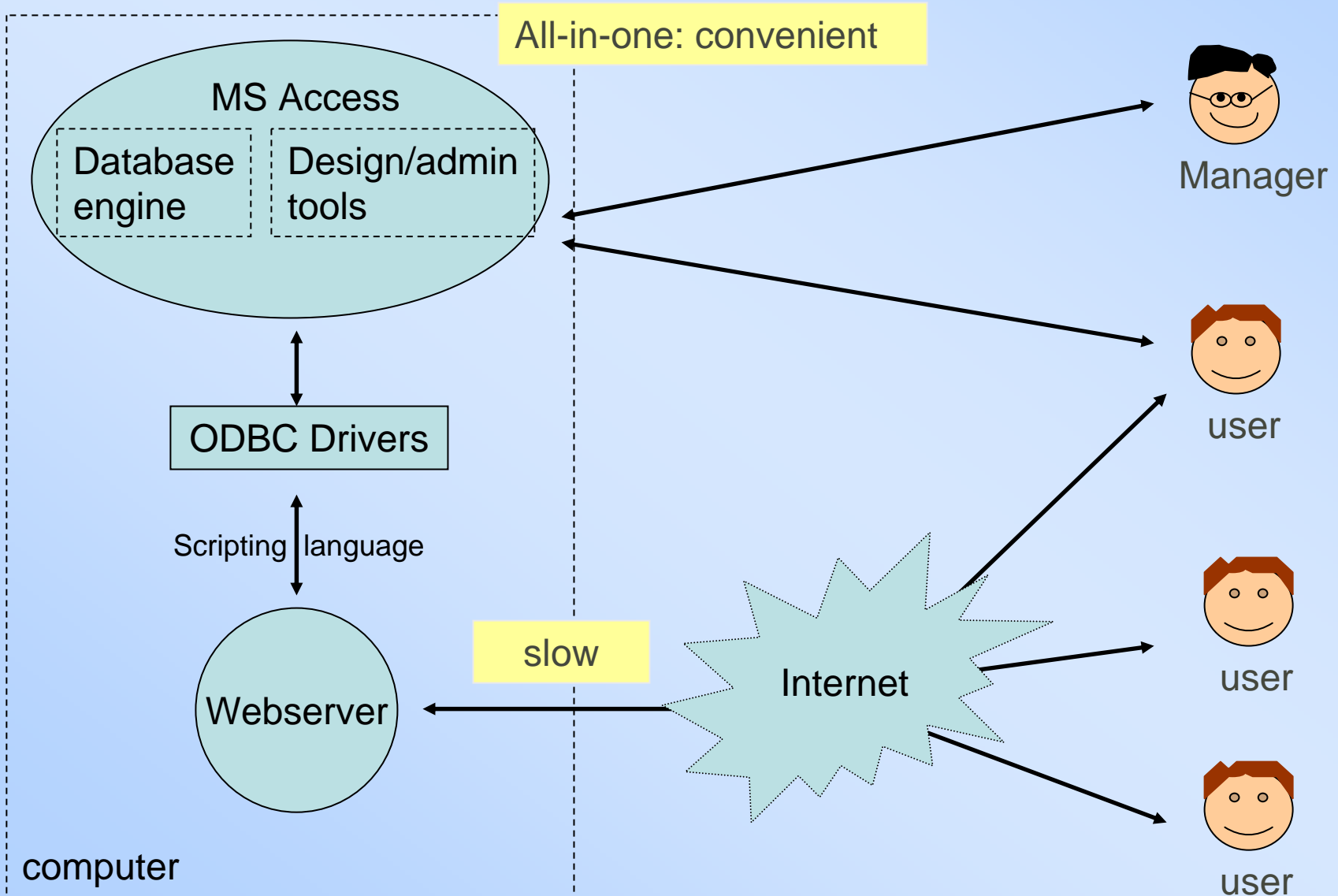


# Popular Configurations



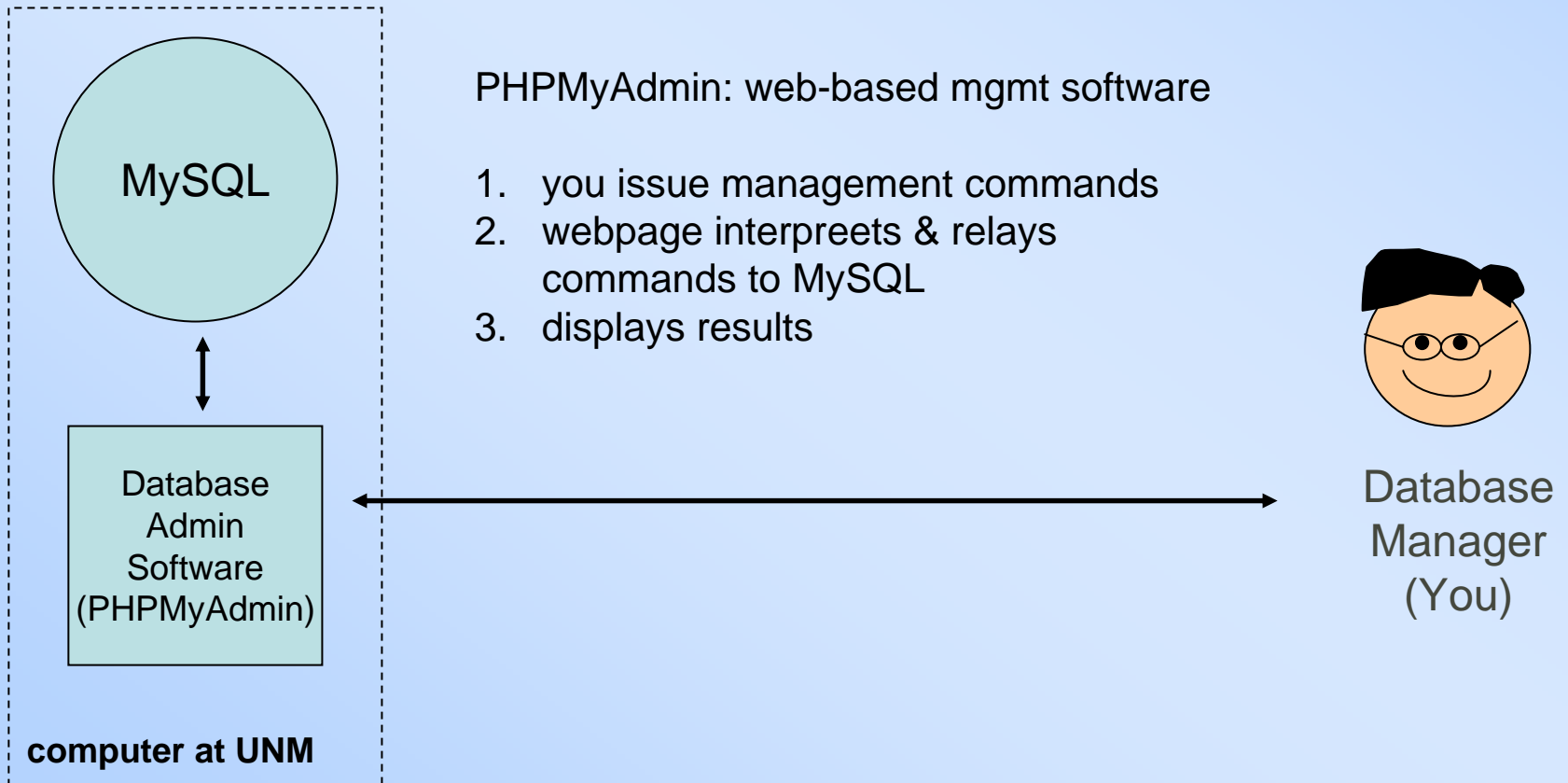


# What about MS Access?





# Our configuration for management





## About PHPMyAdmin

Pro: configure once, can use from any computer with a browser.

Con: webpage-based, so relatively slow for repetitive tasks

(This is what I use)



# Log in to PHPMyAdmin at UNM

phpMyAdmin 2.6.1 - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Refresh

Address **https://www.lternet.edu/mysql/** Go

Google Search 18 blocked Check

**phpMyAdmin**

Welcome to phpMyAdmin 2.6.1

Language: English (en-utf-8) Go

**Login**  
(Cookies must be enabled past this point.)

Server: marsh.lternet.edu

Username: zialab1

Password: training1

Login

1) Go to this web address  
(Note the S in https)

2) Log into website  
(each person has her own login & password ranging from zialab1 through 30)



# PHPMyAdmin Basic Layout

## 3. View & edit table structure or content

### 1. Select a database

Database:

rcn\_admin (2)

rcn\_admin

mytbl

test\_db

### 2. Select a table

Server: [marsh.tinternet.edu](#) Database: [rcn\\_admin](#) Table: [mytbl](#)

[Structure](#) [Browse](#) [SQL](#) [Search](#) [Insert](#) [Export](#) [Operations](#) [Empty](#)

InnoDB free: 10240 kB

	Field	Type	Collation	Attributes	Null	Default	Extra	Action
<input type="checkbox"/>	sdf	int(10)		UNSIGNED	No		auto_increment	

Check All / Uncheck All With selected:

[Print view](#) [Relation view](#) [Propose table structure](#)

[Add](#)  field(s)  At End of Table  At Beginning of Table  After [sdf](#) [Go](#)

Indexes: [?](#)

Keyname	Type	Cardinality	Action	Field
PRIMARY	PRIMARY	2		sdf

Create an index on  columns [Go](#)

Space usage:

Type	Usage
Data	16,384 Bytes
Index	0 Bytes
Total	16,384 Bytes

Row Statistic:

Statements	Value
Format	fixed
Collation	latin1_swedish_ci
Next Autoindex	
Creation	Oct 31, 2005 at

Run SQL query/queries on database rcn\_admin [?](#)

Fields:



# Viewing & Editing Existing Tables

Two key ideas:

1. Table structure vs. content

2. Make a back-up copy of table before big changes

Server: marsh.lternet.edu Database: rcn\_admin Table: mytbl

InnoDB free: 10240 kB

Field	Type	Collation	Attributes	Null	Default	Extra	Action
<input type="checkbox"/>	edf	int(10)	UNSIGNED	No		auto-increment	



# Creating a Table

1. Go to database

The screenshot shows the phpMyAdmin interface. On the left, the 'Database:' dropdown is set to 'rcn\_admin (2)'. Below it, a tree view shows 'rcn\_admin' selected. On the right, the 'Database: rcn\_admin' view shows a table list with 'mytbl' and 'test\_db'. Below the table list, the 'Create new table on database rcn\_admin:' section is visible, with 'Name:' and 'Fields:' input fields. Red dashed circles highlight the 'rcn\_admin' database name and the 'Create new table...' section. Red arrows point from the numbered instructions to these elements.

2. Enter name & number of fields

3. Enter field names and types

4. Designate primary key

The screenshot shows the 'Table structure' configuration for the 'trees' table in the 'rcn\_admin' database. The table has three fields: 'tree\_id' (INT), 'scientific\_name' (VARCHAR, 255), and 'common\_name' (VARCHAR, 255). The 'tree\_id' field is designated as the primary key, indicated by the 'auto\_increment' option in the 'Extra' column. Red dashed circles highlight the 'tree\_id' field and the 'auto\_increment' option. Red arrows point from the numbered instructions to these elements.

Field	Type	Length/Values*	Collation	Attributes	Null	Default**	Extra
tree_id	INT				not null		auto_increment
scientific_name	VARCHAR	255			not null		
common_name	VARCHAR	255			null		

Table comments:

Table type:  Default

Collation:

Add  field(s)





# Importing Data into MySQL

1. Prepare data as delimited plain text file on your computer.
  - A. Select a good delimiter (comma or semicolon) and/or
  - B. Enclose field values in double quotes.
  - C. If using auto-generated primary key, leave first field as a blank .

Tip: use MS Excel, a good text editor, and search & replace.

## Example:

```
,Kim,John,"FSP,San Diego State University",CA,92182  
,Ferry,Kristen,"Sevilleta LTER",NM,56789
```

2. (In PHPMysqlAdmin) back-up table you want to insert to.
3. (In PHPMysqlAdmin) Import: **Structure** Tab → **Insert Data from a Text File**



# Advanced Features

- Foreign keys & referential integrity
- Stored Procedures – set of queries stored on the database.
- Triggers – define a set of actions (queries) when an event (insert, update, delete) happens.
- Transactions – identify a set of queries as an atomic action.
- Spatial extension



## Exercise 1: NPP

Create tables from NPP database design exercise. Import text data into one of the tables.

NPP data is downloadable at  
<http://jkim.sdsu.edu/LaSelva/>

Teams of 2-3.

Time: 30 mins.



## Exercise 2: Your Own Data

Create tables to store your own dataset of choice.

Teams of 1-3.

Time: 30 mins.