

CCT396, Fall 2011

# Database Design and Implementation

Yuri Takhteyev  
University of Toronto



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**Week 7**

**Catchup and Case  
Studies**

Introduction

1-Table SQL

The ER Model

Conversion

Joins

Normalization

Catchup

Applications

Advanced SQL

Documents

Security

Performance

# Normal Forms

5 <sup>th</sup> Normal Form	}	Yet more decomposition
4 <sup>th</sup> Normal Form		
BC Normal Form		
3 <sup>rd</sup> Normal Form	}	No improper dependencies
2 <sup>nd</sup> Normal Form		
1 <sup>st</sup> Normal Form	}	No multi-valued attributes

# 3NF?

(vote\_id, kitten1\_id, kitten2\_id,  
kitten1\_caption, kitten2\_caption,  
vote)

# 3NF?

(photo\_id, caption, date\_uploaded,  
user\_id, user\_name, pro?,  
camera\_id, width, height,  
num\_comments)

(user\_id, user\_name, pro?,  
photo\_id, comment\_text,  
date\_posted)

# 3NF?

(photo\_id, caption, date\_uploaded,  
user\_id, user\_name, pro?,  
camera\_id, width, height,  
num\_comments)

(comment\_id, user\_id, user\_name,  
pro?, comment\_text, date\_posted,  
photo\_id)

# Real Life Examples

<http://toronto.ca/open/>



# Non-ER Diagrams

Flowcharts

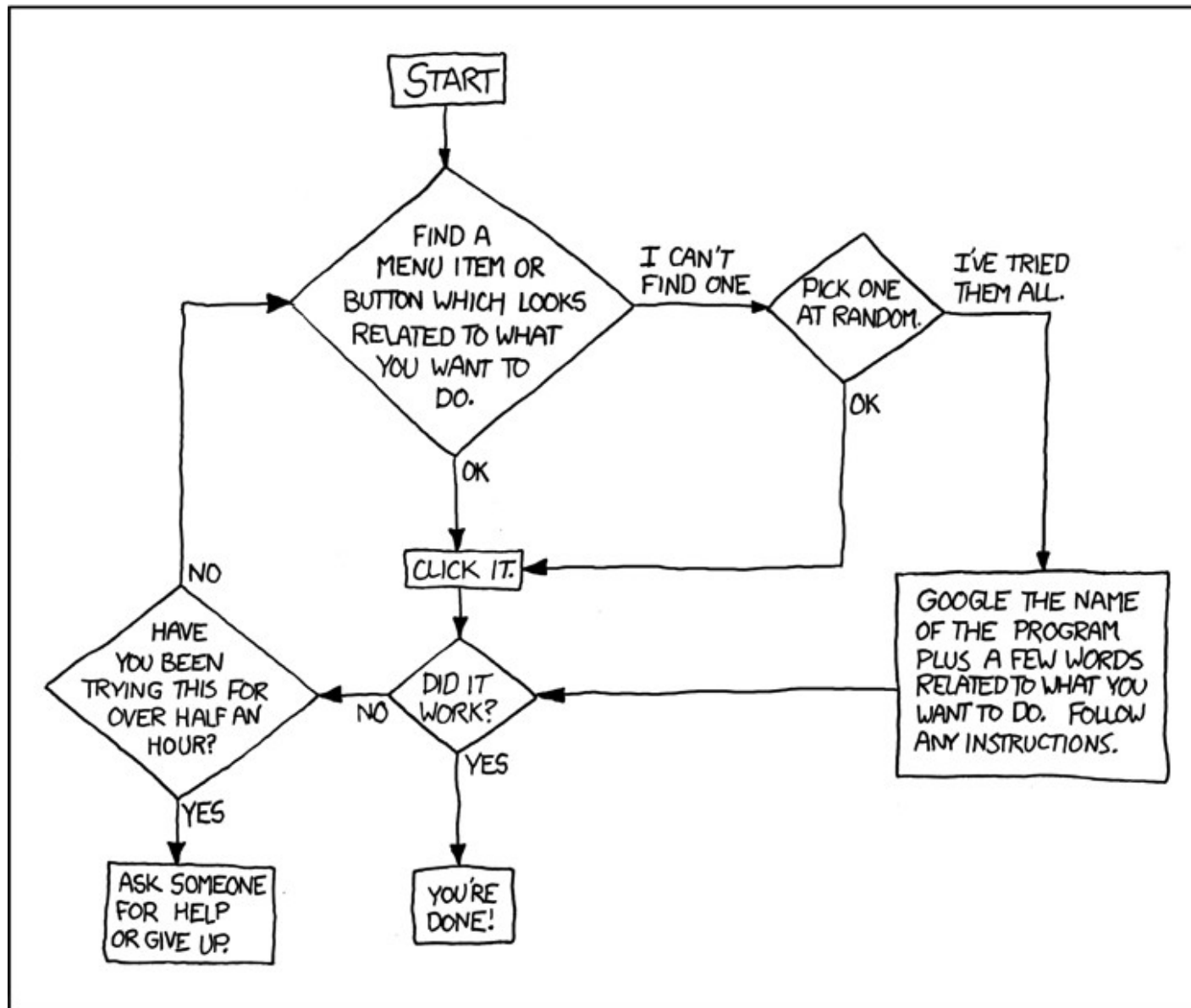
Sequence diagrams

Data flow diagrams

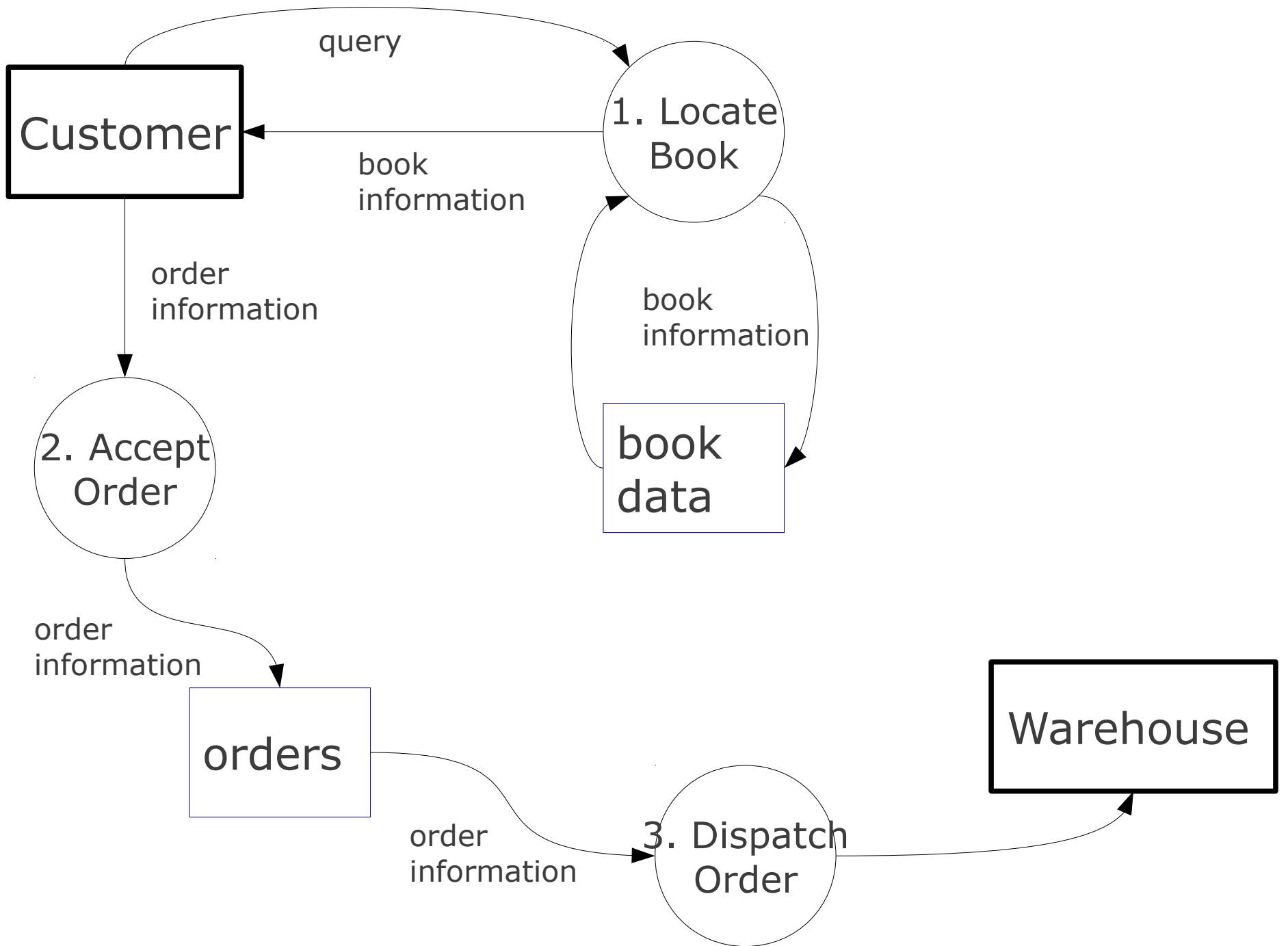
All of those are  
**NOT** ER diagrams

DEAR VARIOUS PARENTS, GRANDPARENTS, CO-WORKERS,  
AND OTHER "NOT COMPUTER PEOPLE."

WE DON'T MAGICALLY KNOW HOW TO DO EVERYTHING IN EVERY  
PROGRAM. WHEN WE HELP YOU, WE'RE USUALLY JUST DOING THIS:



PLEASE PRINT THIS FLOWCHART OUT AND TAPE IT NEAR YOUR SCREEN.  
CONGRATULATIONS; YOU'RE NOW THE LOCAL COMPUTER EXPERT!



# LOAD DATA

```
load data  
local infile "«filename»"  
into table «table»;
```

---

```
load data  
local infile "/tmp/pets.csv"  
into table pet;
```

# Getting the Data

## **Simplest:**

Export from Excel / OpenOffice

## **Alternatively:**

Edit in a text editor

# SCP

## **Option 1:**

In the terminal

## **Option 2:**

A GUI client (PSCP, WinSCP)

# A Terminal App / Bash

## **OSX:**

“Terminal” (pre-installed)

## **Linux:**

“gnome-terminal” (pre-installed)

## **Windows:**

“git-bash” from Git

<http://code.google.com/p/msysgit/>  
(you can use PuTTY if you prefer)

# SSH

ssh **okenobi**@yoda.ischool.utoronto.ca



# More Unix Commands

**ls** – list files in a directory

**cd** – change **d**irectory

**mkdir** – create (**m**ake) a **d**irectory

**rm** – delete (“**r**emove”) a file or directory

**cp** – **c**opy a file or directory

**less** – view a text file

**nano** – edit a text file

**mysql** – start mysql client

some of those commands are available both in your local and remote bash, some just on the server

# Anatomy of the Unix Command

the command

arguments

The diagram shows the command `cp -r /play/yoda /tmp/yoda2` enclosed in a red rectangular border. The command is split into four segments by vertical red lines: `cp`, `-r`, `/play/yoda`, and `/tmp/yoda2`. Three arrows point downwards from the labels 'the command', 'arguments', and 'arguments' to the `cp`, `-r`, and `/play/yoda` segments respectively. An arrow points upwards from the label 'options (may have their own arguments)' to the `-r` segment.

```
cp -r /play/yoda /tmp/yoda2
```

options (may have their own arguments)

# Some Examples

**cd /play**

go to directory “/play”

Hint: press [Tab] after typing “/pl”

**ls**

list the files in the current directory

**cd yoda**

go to directory “yoda”

Hint: press [Tab] after typing “y”

**ls**

Hint: use [↑] for earlier commands

# Some Examples

## **less force.txt**

Hint: press [Tab] after typing "f"

Hint: press "q" to exit less

## **cd ..**

go to up one level

## **ls**

## **cd locked**

go to directory "sandbox"

Hint: you don't have the permissions

# Some Examples

**cd sandbox**

**mkdir obiwan**

create a directory "obiwan"  
(use your own name)

**ls**

we should see everyone's directory

**cd obiwan**

go to your directory

# Some Examples

**ls /play/yoda/**

What was that file called again?

**less /play/yoda/force.txt**

Let's look at it again.

**cp /play/yoda/force.txt .**

copy "force.txt" to the local directory

**nano force.txt**

edit force.txt

Hint: ^ means [Control]

# Options

**ls -sh**

list files with file sizes

**cp -r /play/yoda .**

copy "recursively"

**less -N force.txt .**

show the file with line numbers

# Getting Help

**man ls**

user **manual** for the **ls** command



# Directories

**/home/okenobi**

user's "home" directory

**~**

alias for user's home directory

e.g. "ls ~"

**·**

current directory

**..**

parent of the current directory

# Web Pages

**/home/okenobi/public\_html/**

user's website, maps to

<http://yoda.ischool.utoronto.ca/~okenobi>

**cd ~/public\_html**

**nano index.html**

(Press Ctrl-X to save and quit.)

See <http://www.w3schools.com/html/>  
for intro to HTML.

# Redirection

**command > file.txt**

write the output to file

**command < file.txt**

feed the content of file to the  
command

**command1 | command2**

send the output of command1 to  
command2

(We'll see examples in a second.)

# SQL From a File

```
cd ~
```

```
cp /play/yoda/humans.sql .
```

```
mysql < humans.sql
```

run mysql client feeding it the contents of "humans.sql"

```
mysql < humans.sql > h.txt
```

save the output into "h.txt"

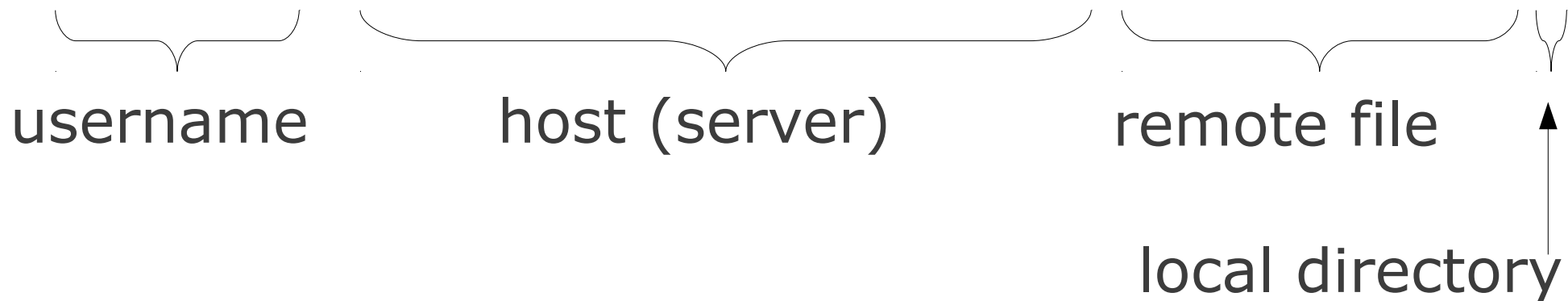
Exercise: create a file "ewoks.sql" that would give us a list of **Ewoks**.

# Remote to Local

```
scp user@host:/remote/file /local/dir
```

e.g.:

```
scp okenobi@yoda.ischool.utoronto.ca:~/pets.csv .
```



# Local to Remote

```
scp /local/file user@host:/remote/dir
```

e.g.:

```
scp pets.csv okenobi@yoda.ischool.utoronto.ca:~/
```

# João's Fair Trade Coffee