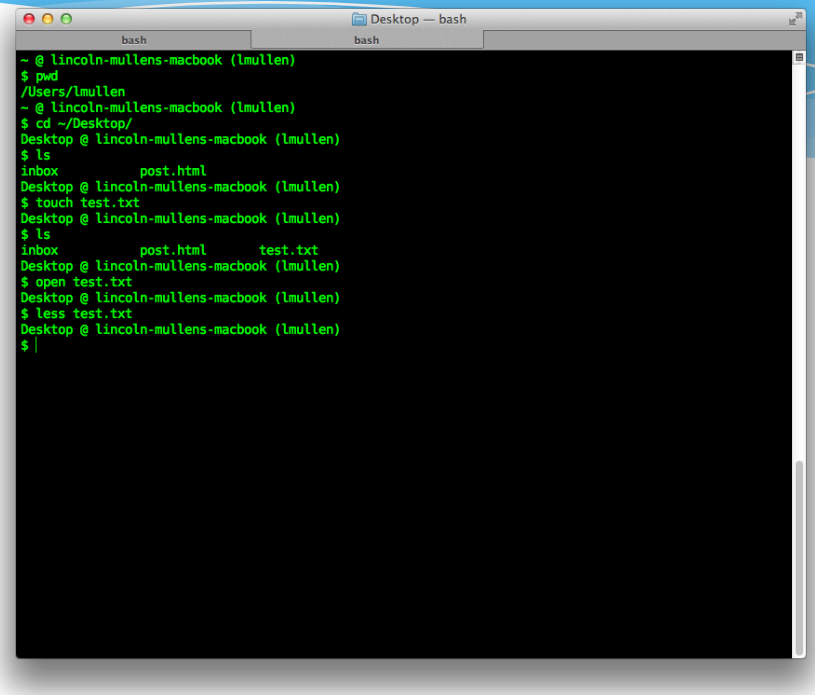
Command Line & VIM

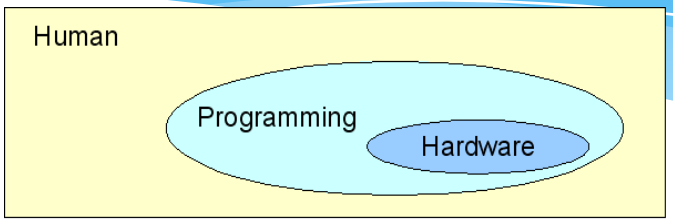
I INF 202 : Introduction to Data & Databases

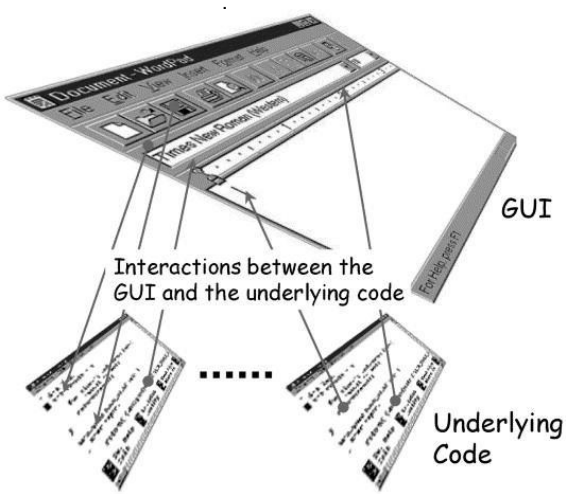
Command Line

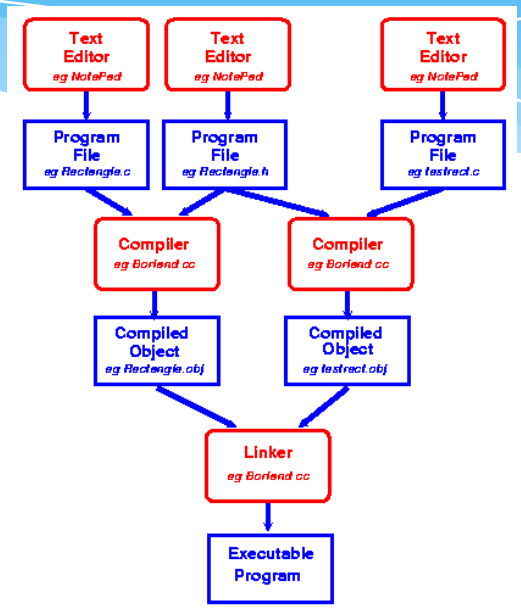


- **Why mess with the command line?**

Reason 1: Humans to Computers







- **Many steps exist between human communication and machine communication. Need interfaces.**

Database

Sales		
reportCode	date	expDestCode
1101	5-Mar	12
1102	7-Mar	23
1103	8-Mar	15
1104	10-Mar	12
1105	12-Mar	25

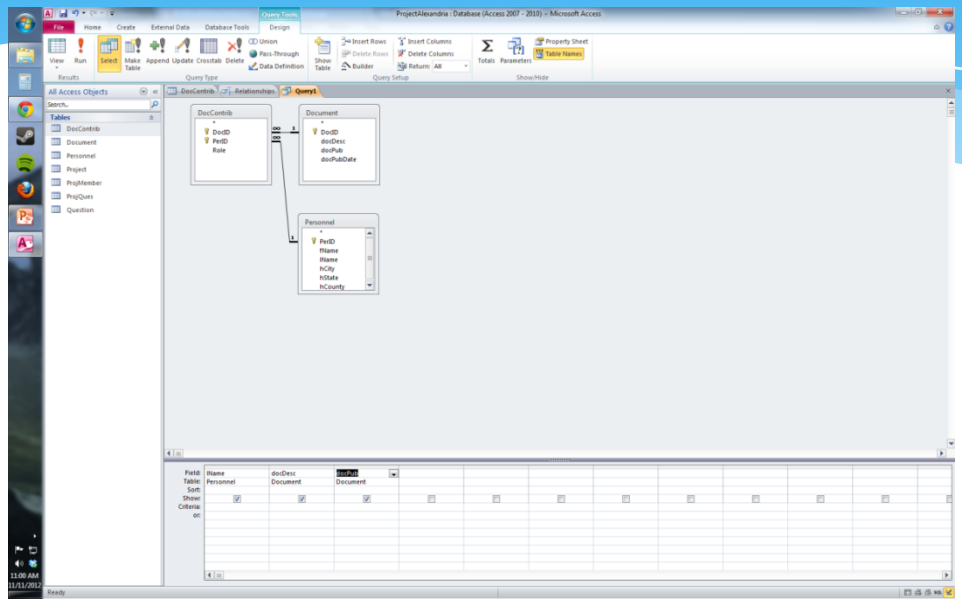
Sales Product		
reportCode	prodCode	qty
1101	101	1100
1101	102	300
1102	103	1700
1102	107	200
1103	104	500
1103	107	700
1103	102	1100
1104	101	2500
1105	103	200
1105	104	700

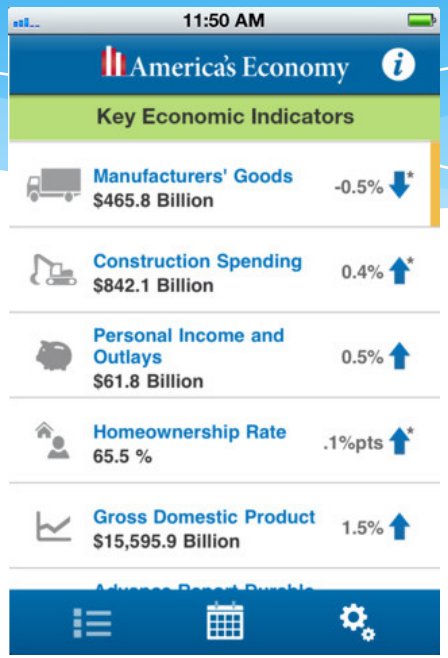
Destination	
exportDestCode	expDestName
12	Kingdom of Minanmi
23	Alpha Empire
25	Kingdom of Ritol

Product		
prodCode	prodName	unitPrice
101	melon	800
102	strawberry	150
103	apple	120
104	lemon	200
107	peach	200

- **The database proper is the tables and the data.**

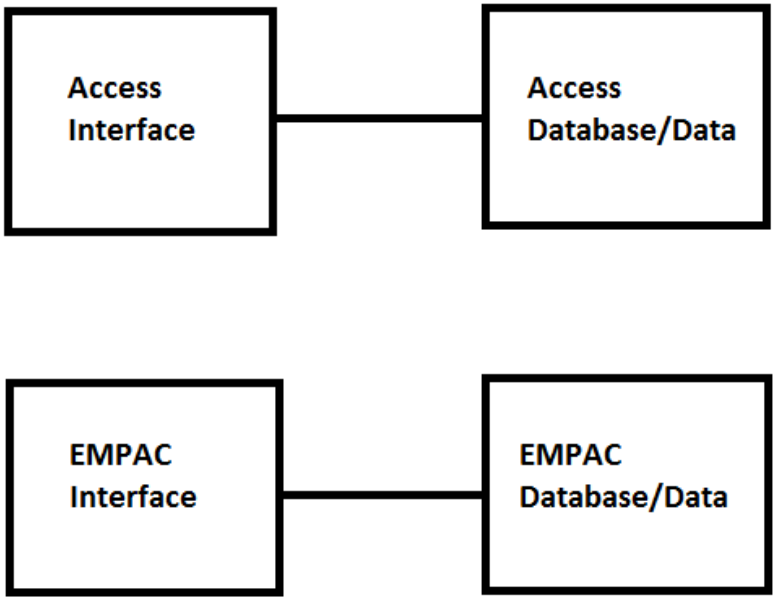
Interface/Application





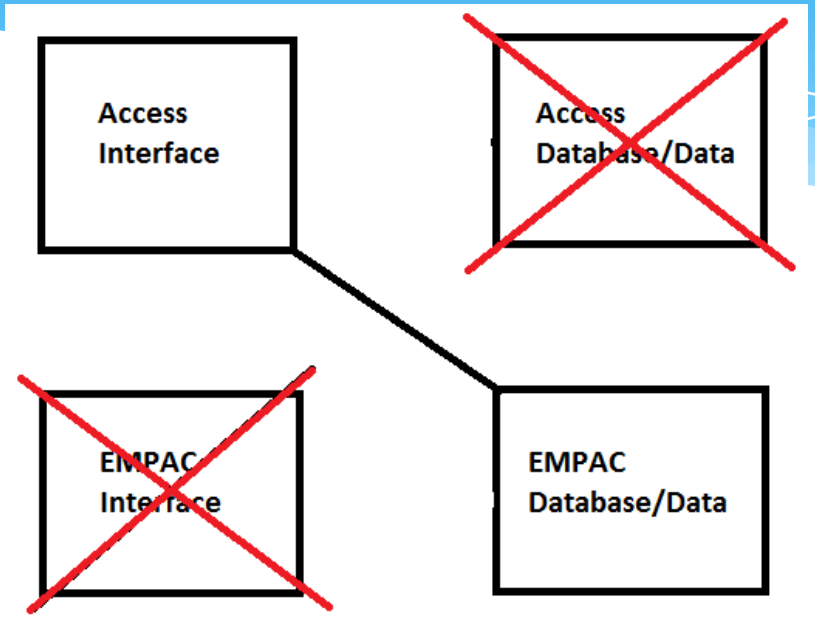
- The interface makes manipulating the database easier.
- An application drops the database further in the background with programmed database commands.

Database Architecture: An Example



- MS Access interface hooked to MS Access database/data.
- EMPAC interface hooked to EMPAC database/data.

Database Architecture: Problem

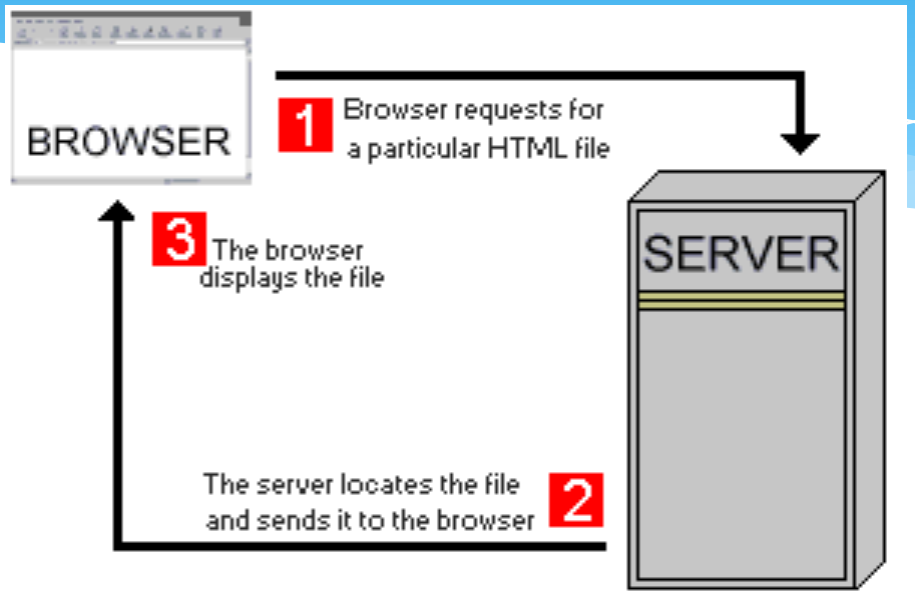


- No data in MS Access database/data. No need for it.
- EMPAC interface rudimentary, developed in 1995. Very un-user-friendly.
- Solution: Call EMPAC database/data into MS Access interface.

Maturity of Technology

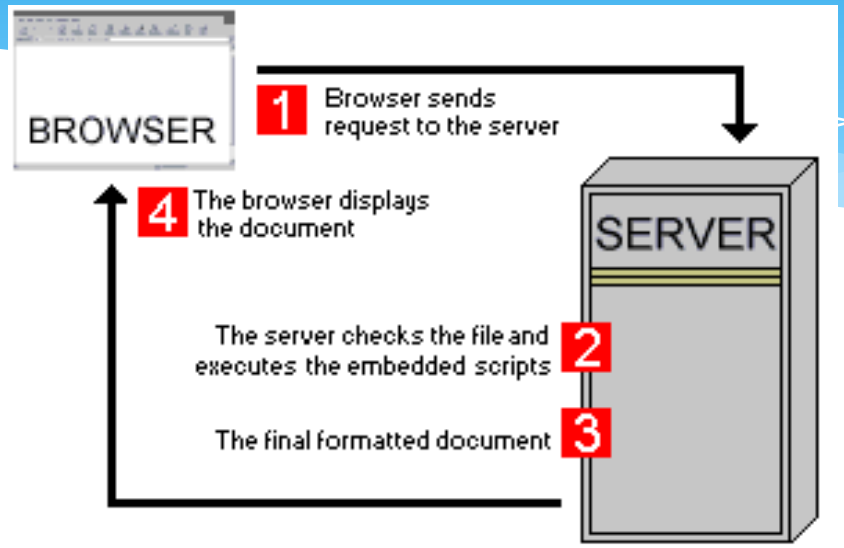
- Relational databases (MS Access, MySQL, etc.) are referred to as “mature” technology because they’ve been around since the 1970s.
- One of the results of “maturity” is user-friendly and robust interfaces/applications. Still, some relational databases work better from command line.
- NoSQL databases are much less “mature”. Friendly interfaces have not developed.
- As a result, most NoSQL databases are manipulated using the command line.
- Bottom line: Command line is good to know.

Reason 2: Internet Adds Complexity



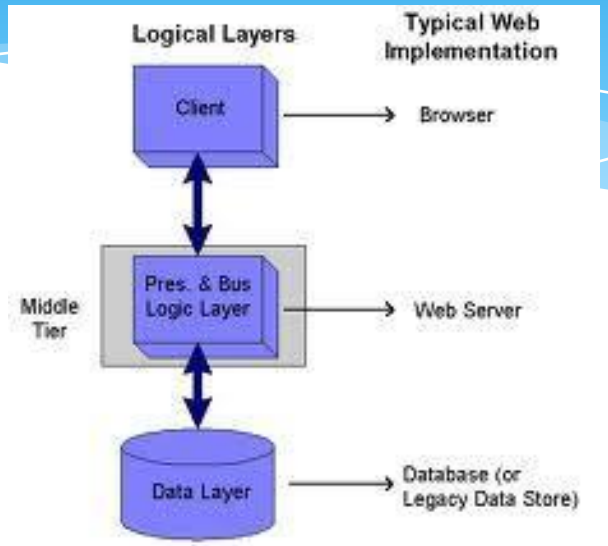
- **Simple case:**
  - **Browser sends address/page request to web server.**
  - **Server sends back requested page(s).**

Internet Adds Complexity



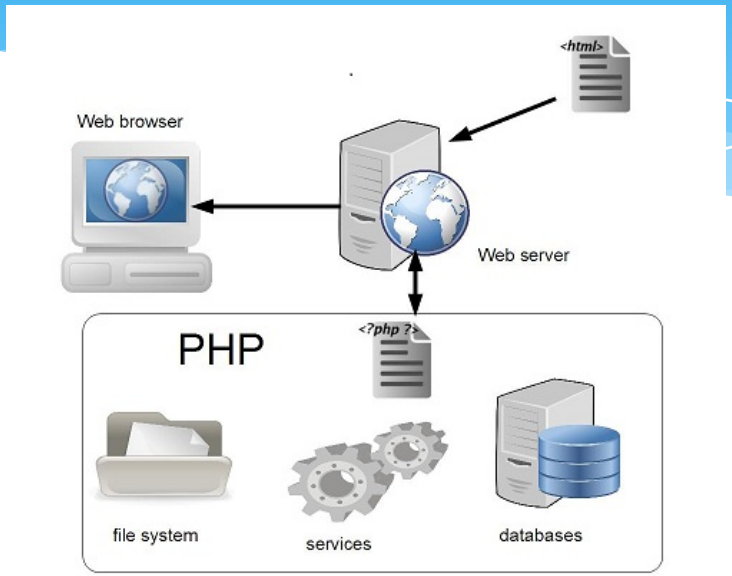
- **More complicated:**
  - **Browser sends address/page request to web server. Request requires more than static pages.**
  - **Server runs scripts and sends back requested page(s)/information. PHP could be server-side script.**

Internet Adds Complexity



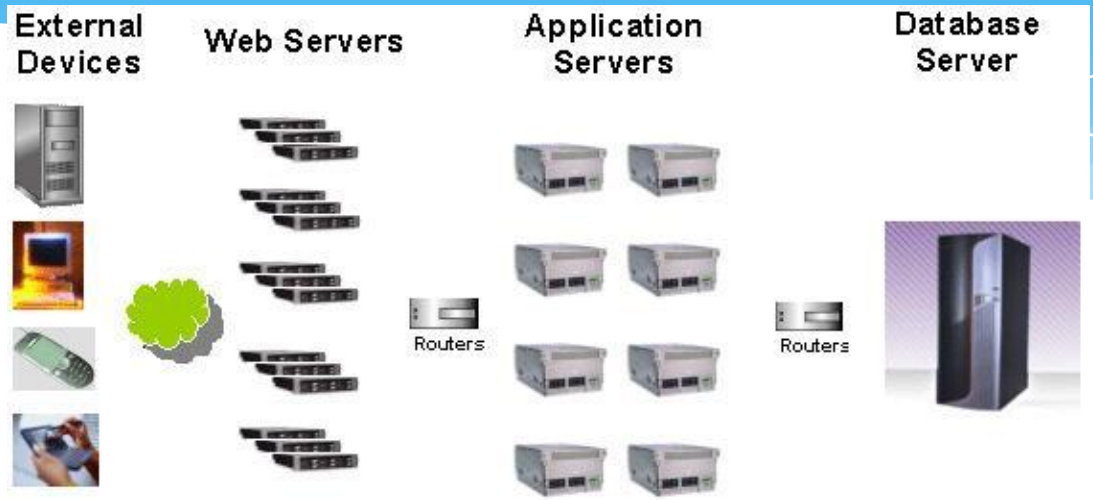
- **Database adds complexity:**
  - **Browser sends address/page request to web server. Request requires more than static pages.**
  - **Server runs scripts and sends back requested page(s)/information. PHP script calls on database.**

Internet Adds Complexity



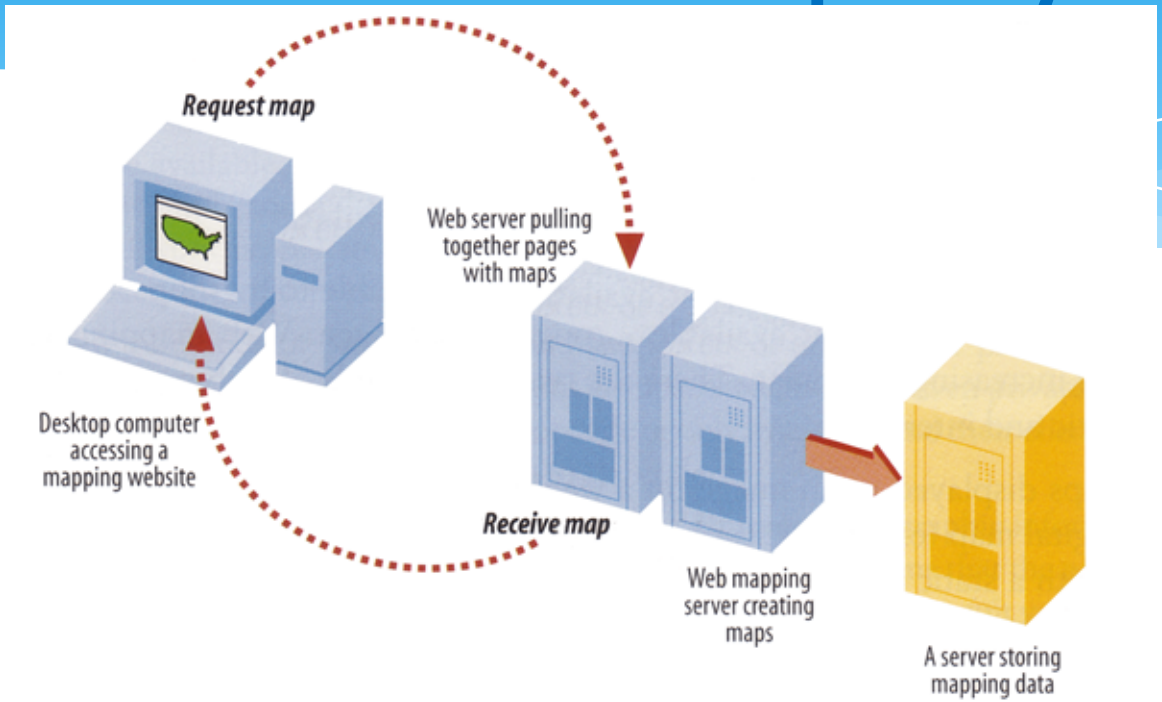
- **More database complexity:**
  - **Browser sends address/page request to web server. Request requires more than static pages.**
  - **Server runs scripts and sends back requested page(s)/information. PHP script works on server side to call on files, services, and databases.**

Internet Adds Complexity



- Browser sends address/page request to web server.
- Web server calls on application servers.
- Applications servers call on database server.

Internet Adds Complexity



- More layers:
  - Browser sends request to web server.
  - Web server calls on mapping application server.
  - Application server calls on map data database server.

So . . . Why the Command Line?

- **No Choice: With newer technologies and certain tools, interfaces (including Graphic User Interfaces – GUIs) don't exist.**
- **More Control: Given interlocking browsers, applications, servers, databases, etc., no single interface works. Command line is common language for all.**

Log On

* Depending on your choice of operating system (Windows or Mac), logon to INF 202 Shared server using:

  - Logging Into INF Shared Server using a Mac.pdf
  - Logging Into INF Shared Server using Windows.pdf

Navigating Server

- PuTTY or Terminal launches with your home directory selected.
- When you log in the terminal, you will arrive at your “HOME” directory.
- Every user gets its own directory and it is commonly referred as the “HOME”.
- In practice, this directory typically has your username on it.
- You can use the ~ symbol to get to “HOME” directory.

Navigating Server

- To find out which directory you are in, type “pwd” (Print Working Directory).
- To find out what’s in this directory, type “ls” (short form) or “ls -l” (long form).

```
ubuntu@ip-10-182-189-221:~$ pwd
/home/ubuntu
ubuntu@ip-10-182-189-221:~$ ls
INF202  INF-Server-Configuration  webadmin
ubuntu@ip-10-182-189-221:~$ ls -l
total 12
drwxrwxr-x 2 ubuntu ubuntu 4096 Jan 30 01:40 INF202
drwxr-xr-x 4 ubuntu ubuntu 4096 Jan 27 02:29 INF-Server-Configuration
-rw-r--r-- 1 root   root   1096 Dec  8 15:05 webadmin
ubuntu@ip-10-182-189-221:~$
```

Navigating Server

HOME ← You are here!

Navigating Server

- To create a directory, type “mkdir INF202.”
- See newly created directory with “ls”.
- Navigate to the new directory by entering “cd INF202”.
- Use “pwd” to see where you are and “ls” to see what’s there (nothing there!)

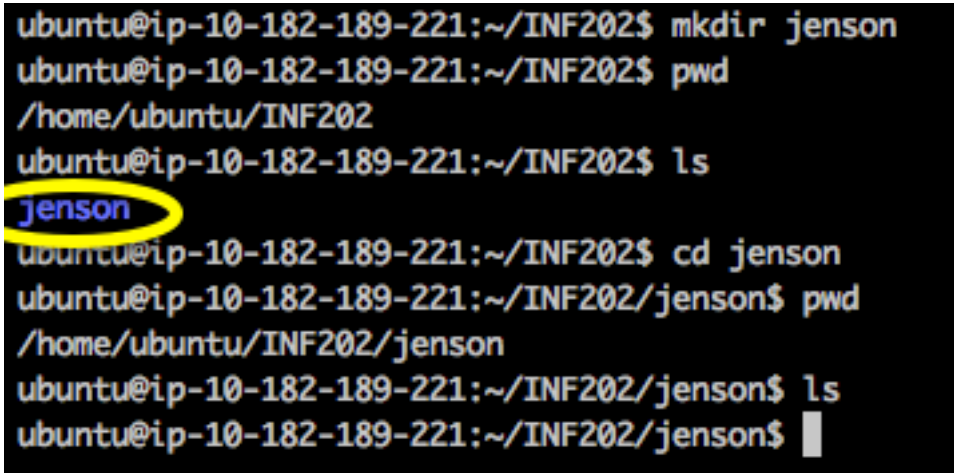
Navigating Server

HOME

INF202 ← You are here!

Navigating Server

- You are in directory INF202. To create a (sub)directory, type "mkdir *yourfirstname*."
- Again show INF202 directory with "pwd", find out what's in it with "ls".
- To navigate down to the (sub)directory, enter "cd *yourfirstname*". Repeat "pwd" and "ls".



Navigating Terminal

HOME

INF202

yourfirstname ← **You are here!**

Navigating Server

- To navigate back to INF202, type “cd ..” Repeat “pwd” and “ls”.
- To navigate back to home directory, type “cd ..” Repeat “pwd” and “ls”. This is the directory that you started in.

The Continents of INF202

- Move to the server's home directory (not your home directory) by typing "cd .."
- Move one step higher by typing "cd .."

```
ubuntu@ip-10-182-189-221:~$ cd ..
ubuntu@ip-10-182-189-221:/home$ cd ..
```

```
ubuntu@ip-10-182-189-221:/$ ls -l
total 88
drwxr-xr-x   2 root root  4096 Jan 24 20:12 bin
drwxr-xr-x   3 root root  4096 Jan 24 20:12 boot
drwxr-xr-x   3 root root  4096 Jan 27 17:53 data
drwxr-xr-x  12 root root  3880 Dec 26 20:28 dev
drwxr-xr-x 109 root root  4096 Jan 30 04:01 etc
drwxr-xr-x  32 root root  4096 Jan 30 04:01 home
drwxrwxrwx   2 root root  4096 Feb  2 03:33 INF202JJ
lrwxrwxrwx   1 root root    33 Oct  3 07:05 initrd.img -> /boot/initrd.img-3.2.0-54-virtual
drwxr-xr-x  20 root root  4096 Jan 28 17:36 lib
drwxr-xr-x   2 root root  4096 Dec 26 20:27 lib64
drwx------   2 root root 16384 Oct  3 07:06 lost+found
drwxr-xr-x   2 root root  4096 Oct  3 07:04 media
```

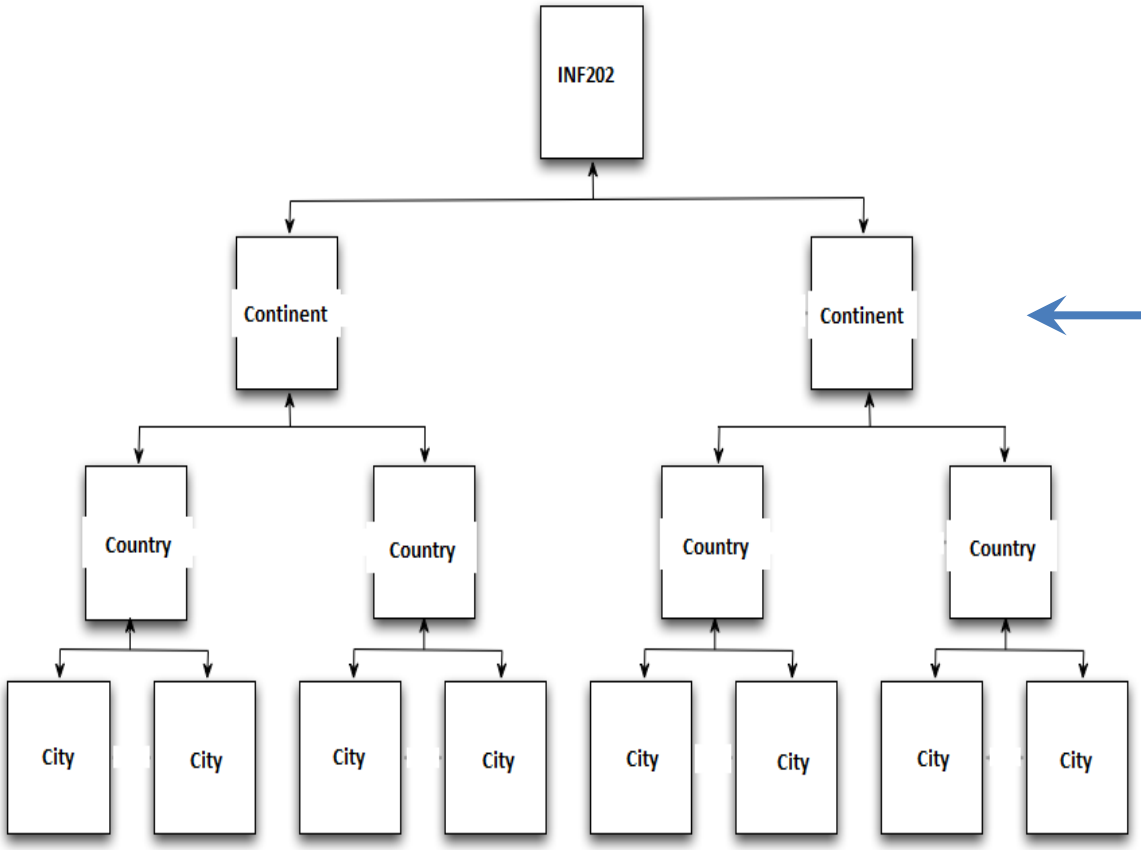
The Continents of INF202

- View the directories available here with “ls”.
- Use the “cd” command to enter “INF202JJ”.
- Type “ls”.

The Continents of INF202

- Use the “cd” command to enter the continent directory.
- Check where you are: “pwd”.
- See what’s there: “ls”.

Navigating Terminal

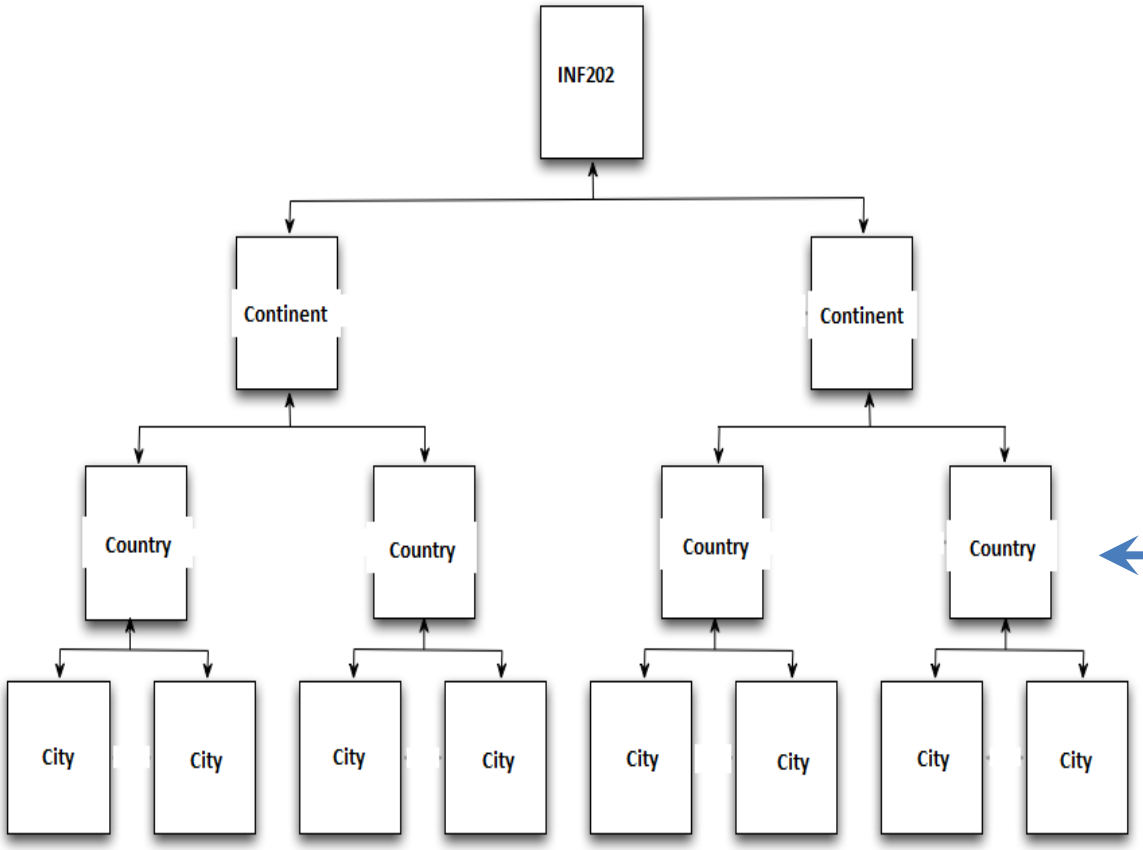


You are here!

The Countries of INF202

- Each team member should use the “mkdir” command to create a directory with the name of a country in that continent.
- Use Google if you don’t know enough country names for your continent.
- Coordinate with your team members to avoid repeating countries. Also, don’t repeat countries that are already created. If you can’t find any new countries in your continent, skip the “create country” task.
- Use the “cd” command to enter the country directory that you created (or any country you like, if you didn’t create one).
- Use the “pwd” command to verify where you are.

Navigating Terminal

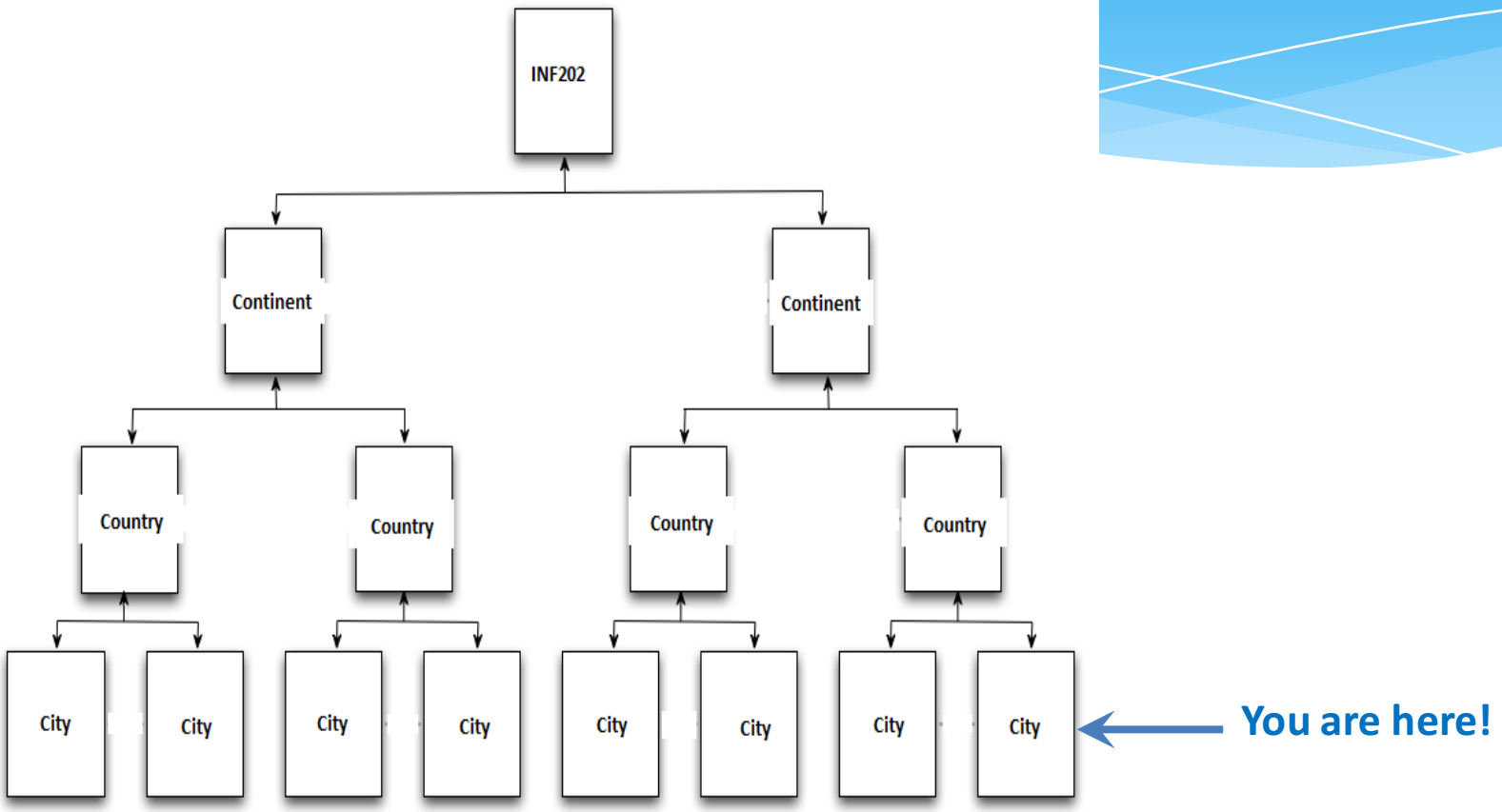


You are here!

The Cities of INF202

- Use the “mkdir” command to create 3 city directories that can be found in that country. If you are not in a new country directory, find out what cities already exist (“ls”) and create 3 new ones.
- Use Google searches if you need to find names of cities in that country.
- Use the “cd” command to enter one of those city directories.
- Use the “pwd” command to verify where you are.

Navigating Terminal



Where's Waldo?

- Use the "mkdir" command to create a directory with your name written as first_last. For example, Dima Kassab will use dima_kassab as directory name.
- Use the "cd" command to go back to the /INF202MAJ
- Use the "pwd" command to verify where you are.
- Use the "cd", "pwd", and "ls" commands to navigate in and out of directories and find as many of your classmates as you can. Complete the "Find Students" assignment in Section 1.7 Command Line on Blackboard.

Vim Tutorial

- Type “vimtutor”
- Read text on screen and follow directions.
- Complete at least lesson 1. (Feel free to go on as long as you want.)
- Know what Insertion mode and command mode are.
- To enter command mode, press “escape” key.
- To enter insertion mode, press “I” key.

Vim Tutorial

- With your newfound command line knowledge, make sure you are in your named folder in a continent/country/city folder.
- With your newfound Vim knowledge, create a file in your named folder listing the background information that you posted on your introduction to the INF 202 class.