CS411 Project Overview

Spring 2011

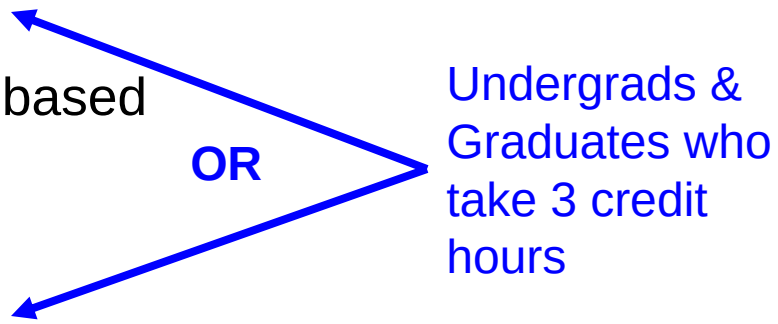
Administrative Stuff: Vote for final exam date

- Due to large size, need to arrange Final Exam date
- Go to Feedback page on the course website
  - https://agora.cs.illinois.edu/display/cs411sp11/Feedback
- Vote for final exam date by

January 28th, 3pm

CS411 Course Project

- Track 1 Application Oriented
  - Building a Database-Driven Web-based Information System
- Track 2 System Oriented
  - System Project over Open Source DBMS



Project Information: https://agora.cs.illinois.edu/display/cs411sp11/Course+Projects

CS411 Course Project

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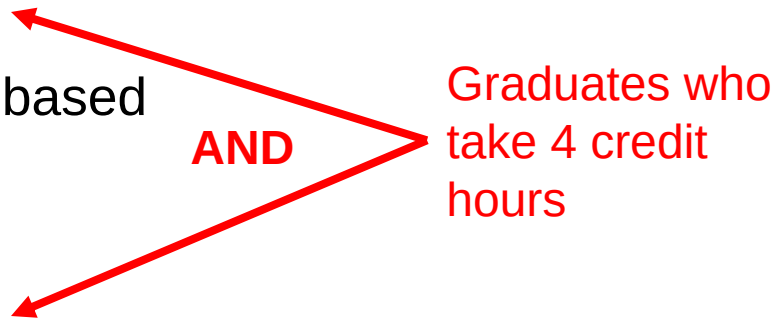


Project Information: https://agora.cs.illinois.edu/display/cs411sp11/Course+Projects

Project Track 1: Building a Database-Driven Web-based Information System

- Team work: a group of 3 or 4 people
- Goal:
  - Identify an application domain that
    - Requires a database
    - Accessible over the Web
  - Design the database
  - Define application functionalities
  - Implement
  - Demo (and showcase)
- Milestone in 5 stages
  - https://agora.cs.illinois.edu/display/cs411sp11/Project+Track+1

Project Information: https://agora.cs.illinois.edu/display/cs411sp11/Course+Projects

How to choose a good project topic?

- Your application must be useful
  - Will there be people using your application?
  - Why should they use your application?
- Your application must be realistic
  - Your data must be real
    - Where do you get your data?
  - Amount of data in database must be reasonable
- You should have fun
  - Find an application you like to do and have fun with it

Project Information: https://agora.cs.illinois.edu/display/cs411sp11/Course+Projects

What are some cool projects in the past?

- Pokedex 2.0
  - http://www.youtube.com/watch?v=YTYQuESBvbU
- Ultimate Dining
  - http://www.youtube.com/watch?v=L_Wp_Y5yKoM
- Illini Crime
  - http://www.illinicrime.com/

Your application can be the next startup!

Project Information: https://agora.cs.illinois.edu/display/cs411sp11/Course+Projects

Some more project statistics

- Academic
  - Course material search, project partner search, etc
- Entertainment
  - Book recommendation, music/playlist sharing, fantasy football analysis, etc
- Food
  - Restaurant search, alcoholic beverage shopping assistant, etc
- Productivity systems
  - Task management, human resource management, etc
- Healthcare
  - Physician recommendation
- Social Media
  - DeviantArt/Facebook mashup,
- Others
  - Stocks, weather tracking, etc etc etc

What's your crazy idea?

What are our expectations for track 1?

- Every stage must be approved before next
  - Stage 0 Group formation (Feb. 9, 2011)
  - Stage 1 Functional description and ER Design (Feb. 18, 2011)
  - Stage 2 Development plan (Mar. 2, 2011)
  - Stage 3 Setup development environment (Mar. 9, 2011)
  - Stage 4 Initial demo (Mar.16, 2011)
  - Stage 5 Final demo and report (Apr. 20, 2011)

Project Information: https://agora.cs.illinois.edu/display/cs411sp11/Course+Projects

What are our expectations for track 1?

- Grading
  - Final Demo (80%)
    - 4 Basic Functions (50%)
    - 2 Advanced Functions (30%)
  - Final Report (20%)

Application must be a complete working system

Project Information: https://agora.cs.illinois.edu/display/cs411sp11/Course+Projects

Track 1: Your application must meet all the functionality requirements.

- 4 Basic Functions
  - Insert records to the database
  - Search the database and print returned results
    - Must demo several interesting queries
    - One query must involve join of multiple tables
  - Show how to update records
  - Show how to delete records

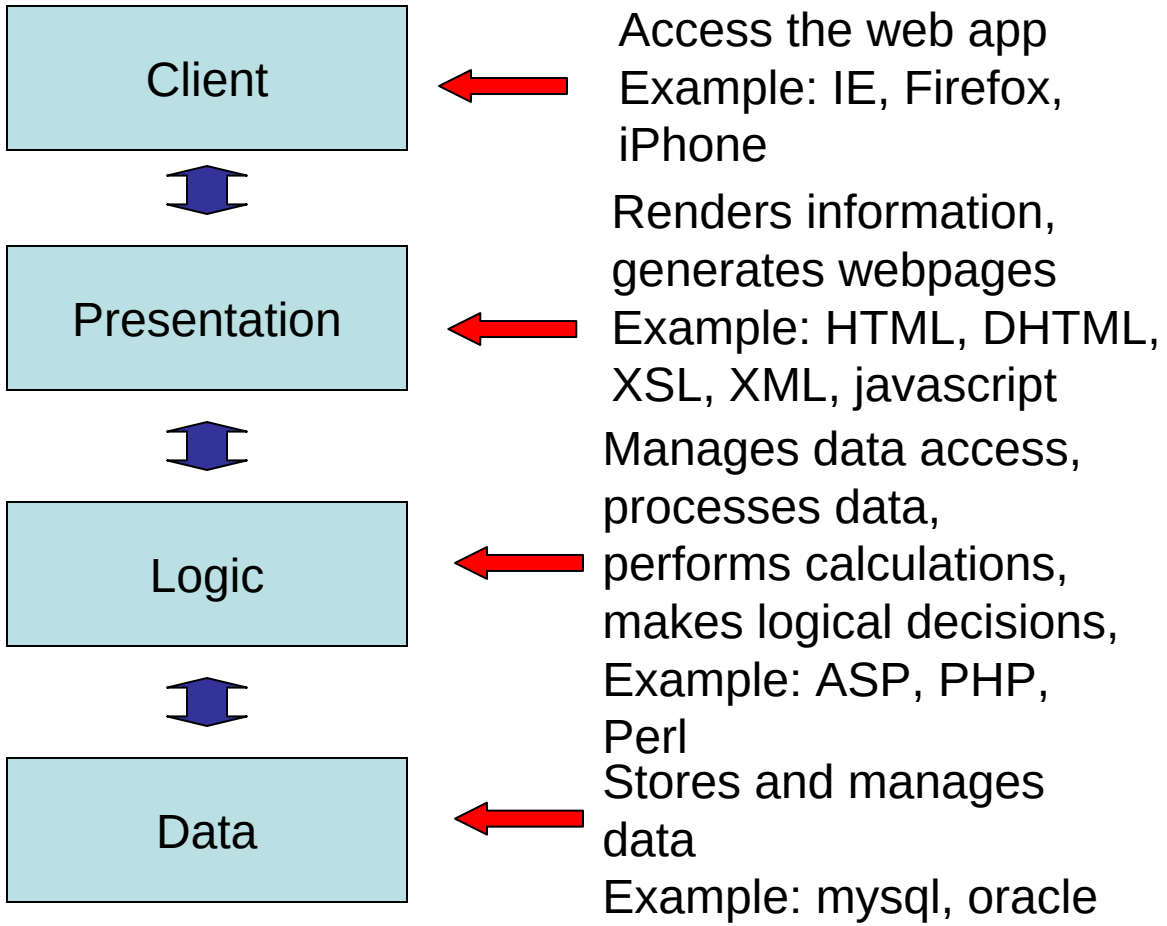
Project Information: https://agora.cs.illinois.edu/display/cs411sp11/Course+Projects

Track 1: Your application must meet all the functionality requirements.

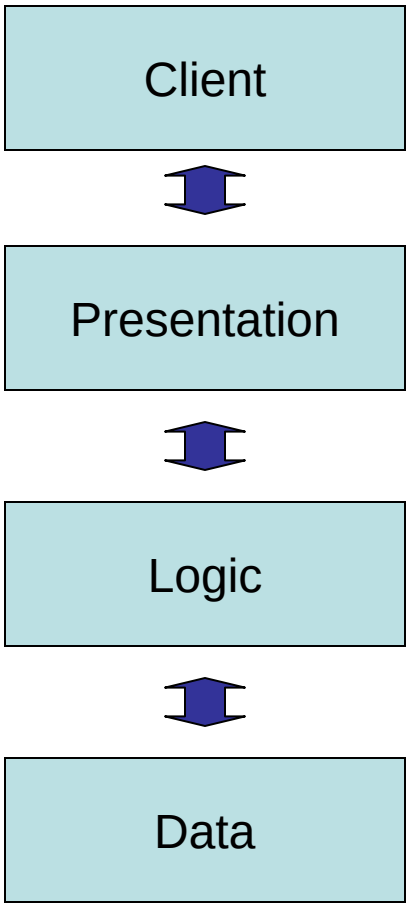
- 2 Advanced Functions
  - Should be relevant and useful for your application
  - Don’t exist in equivalent web sites/applications
  - Go beyond the basic functions
  - Should be technically challenging
    - Need to spend some significant time (at least a few days work) to implement
  - Examples:
    - Creative use of google map
      - Pokedex: overlay pokemon world onto google map
    - NOT:
      - User-friendly interface
      - “I code the site with ajax”

Project Information: https://agora.cs.illinois.edu/display/cs411sp11/Course+Projects

How do I Implement a Web App?

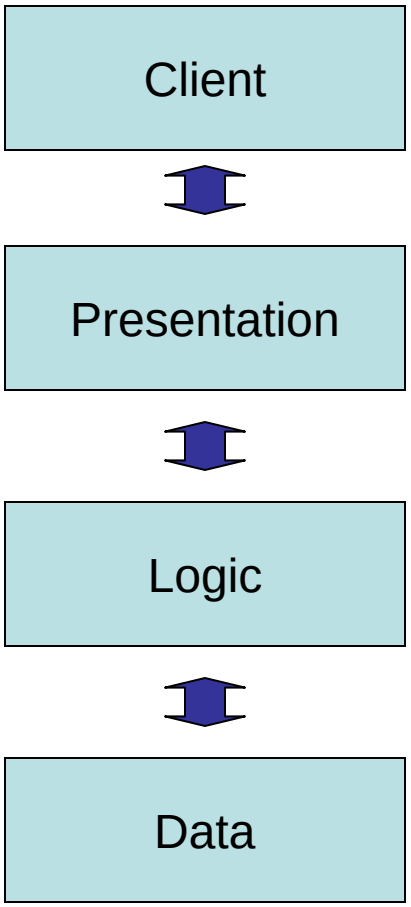


Use Pokedex as an example.



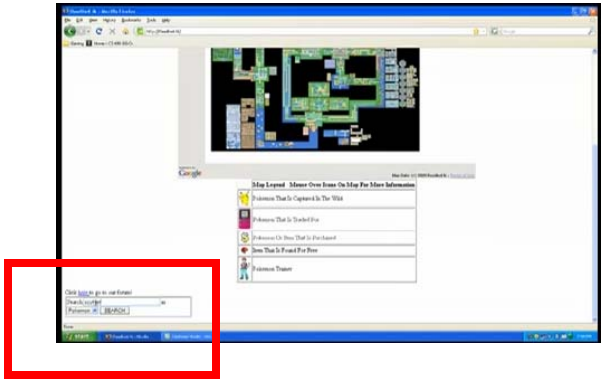
Application is a website accessible via a web browser.

Use Pokedex as an example.



Use HTML and Javascript to create website and display google map

Use Pokedex as an example.



Client

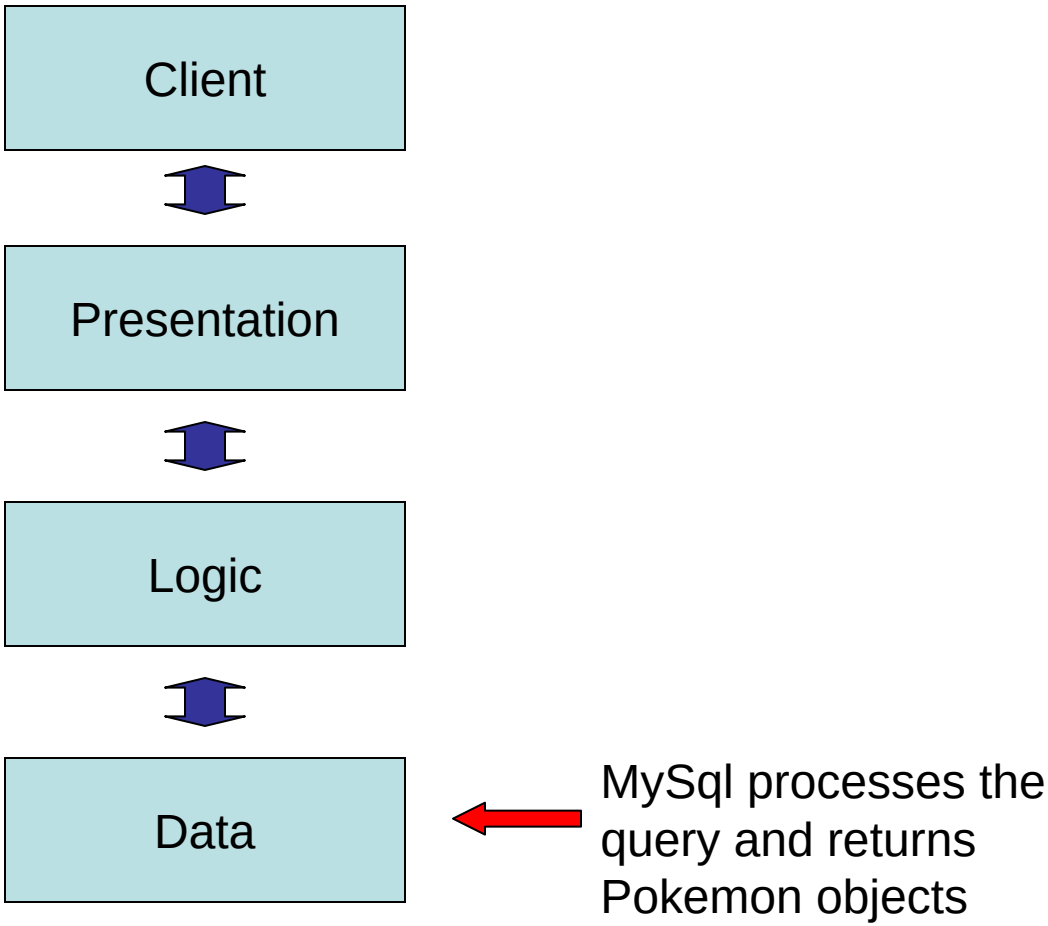
Presentation

Logic

Data

PHP takes search string, creates a SQL query, sends query to MySQL

Use Pokedex as an example.



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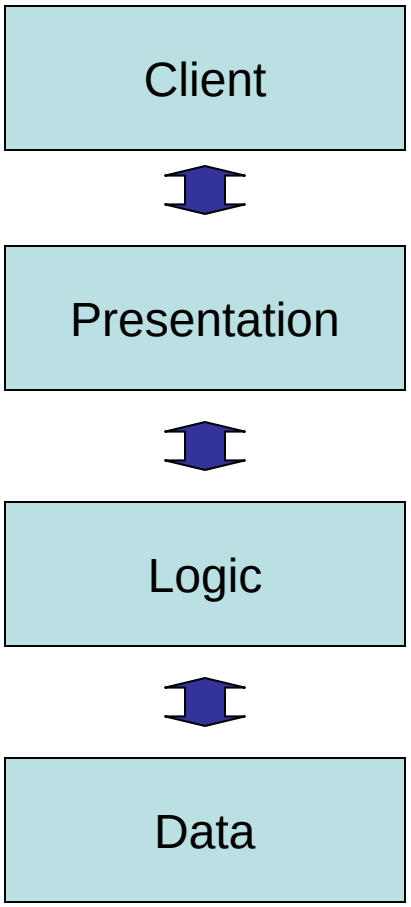
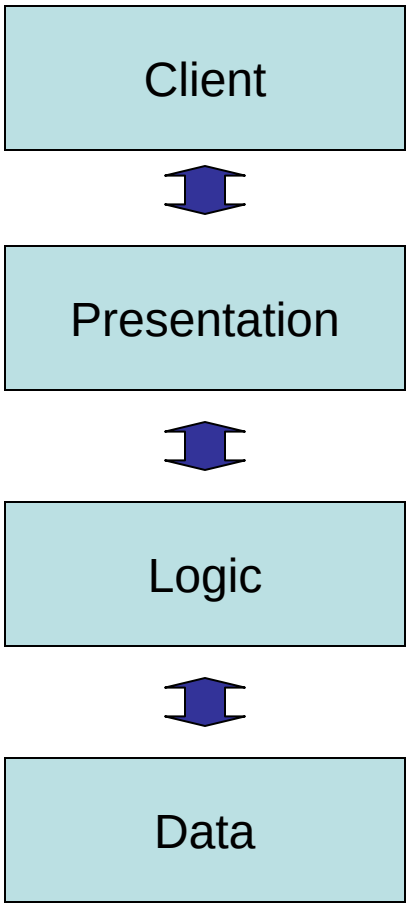


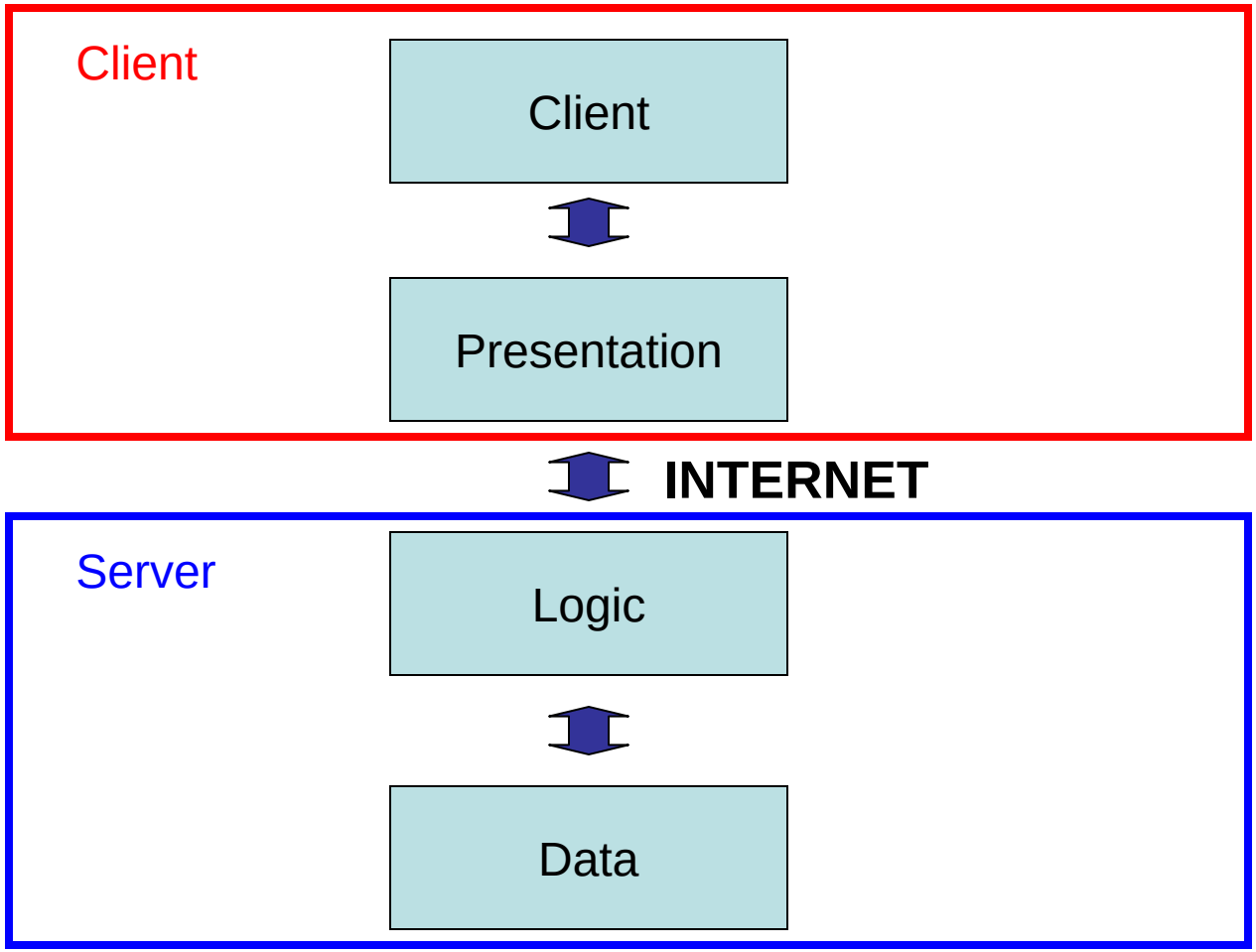
PHP processes results (i.e. transform location points into map coordinates)

Use Pokedex as an example.

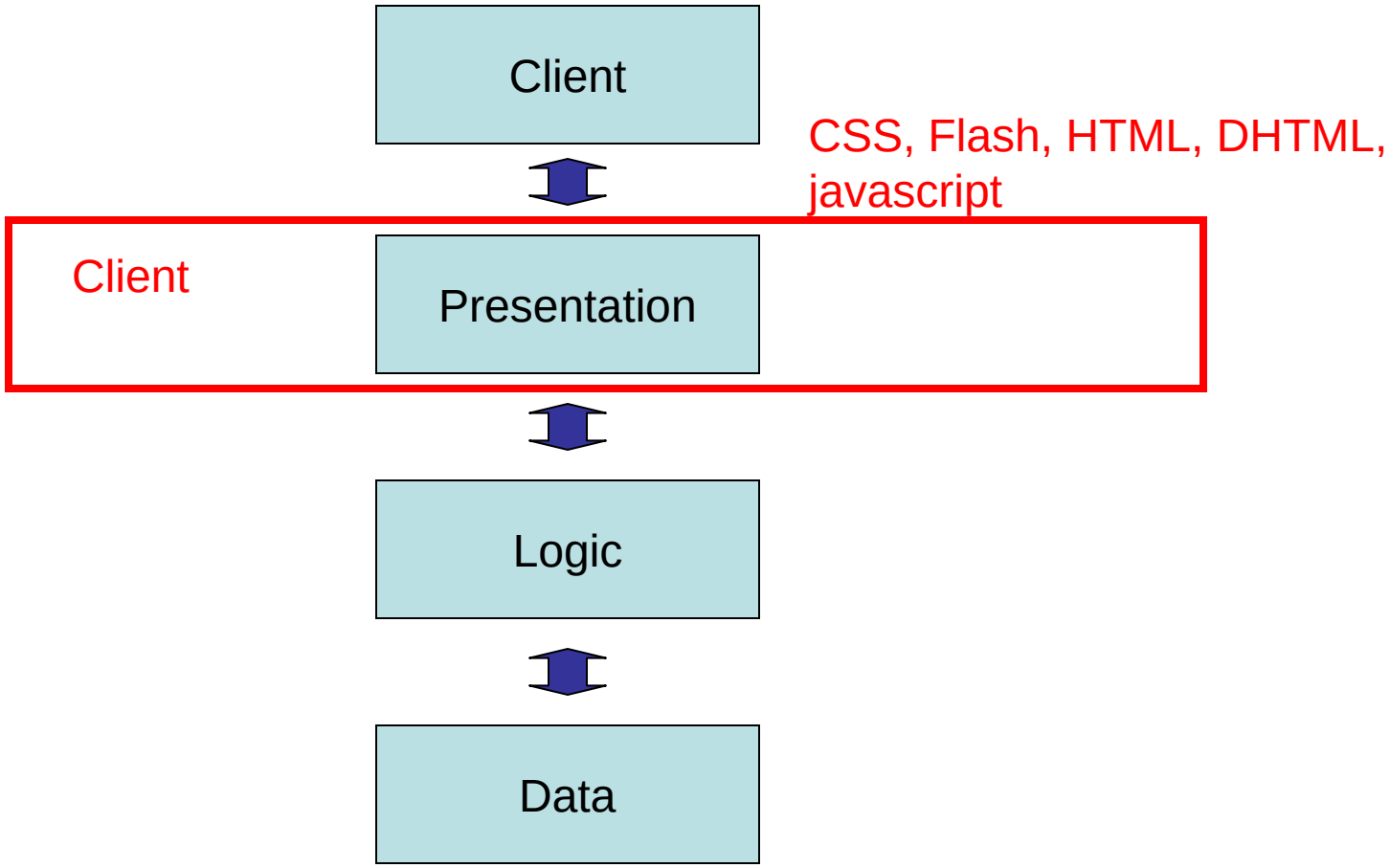


Javascript renders processed results to google map

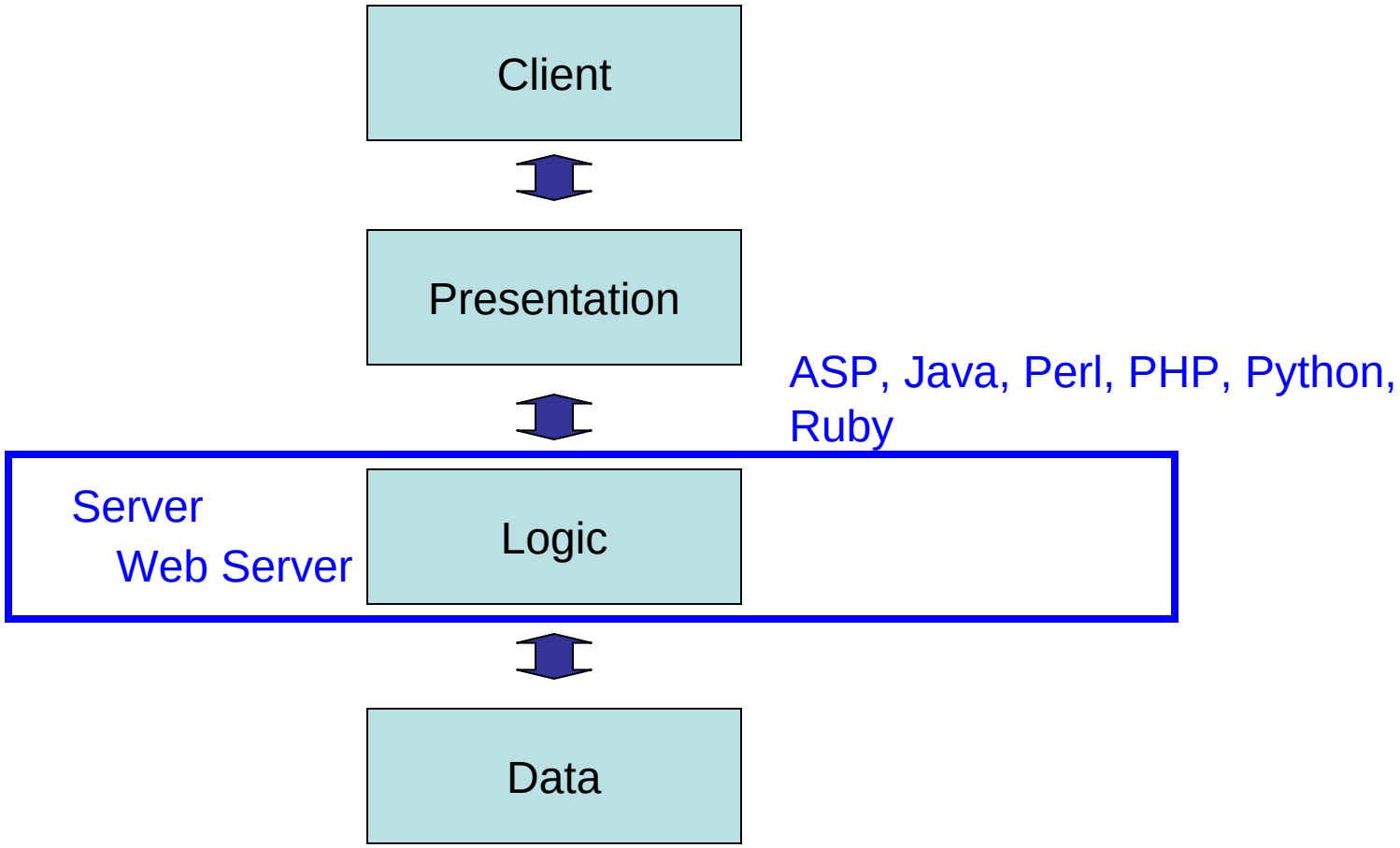
Client vs Server



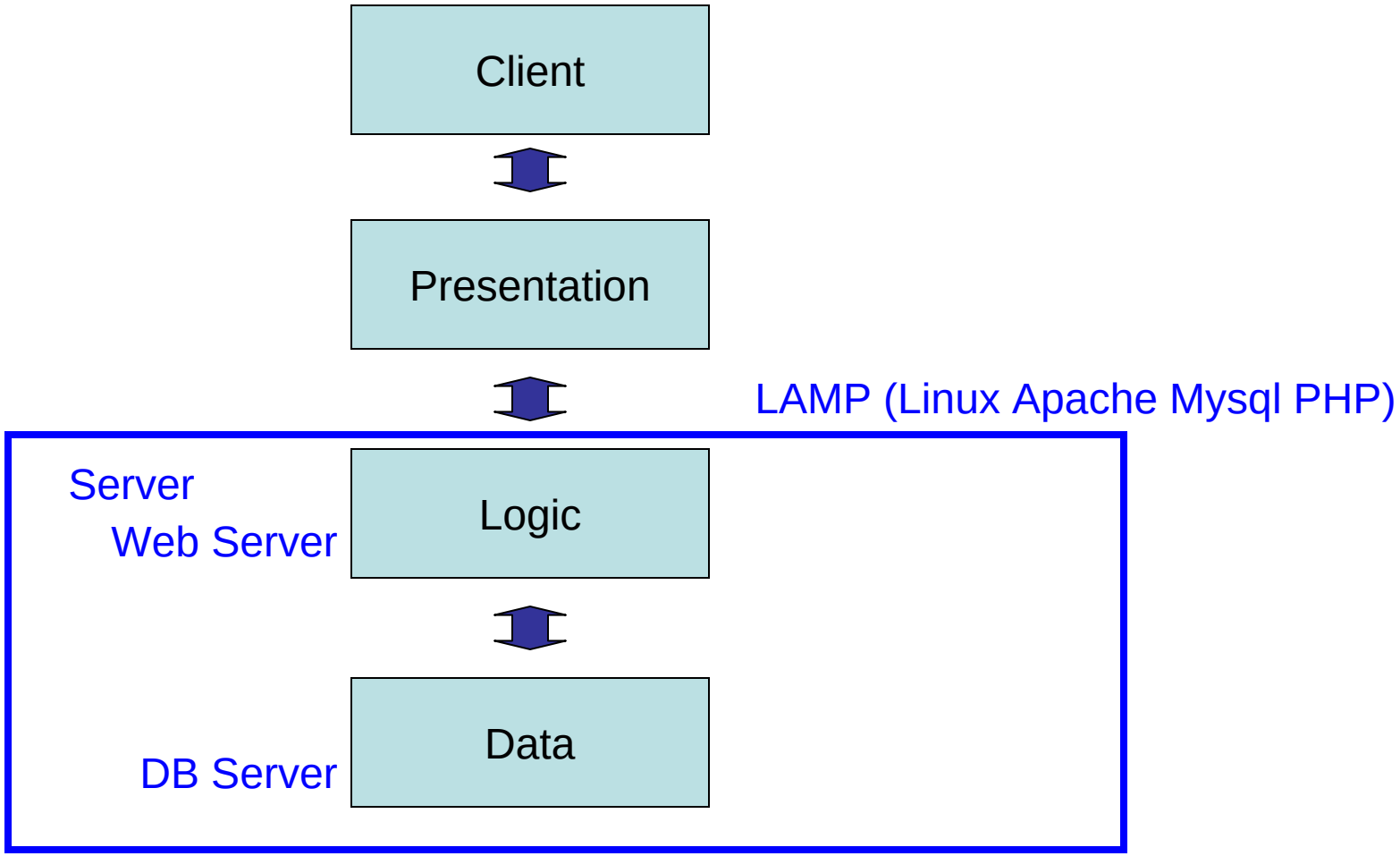
Client Side Scripting



Server Side Scripting



Common Software Bundle for Building Web Apps

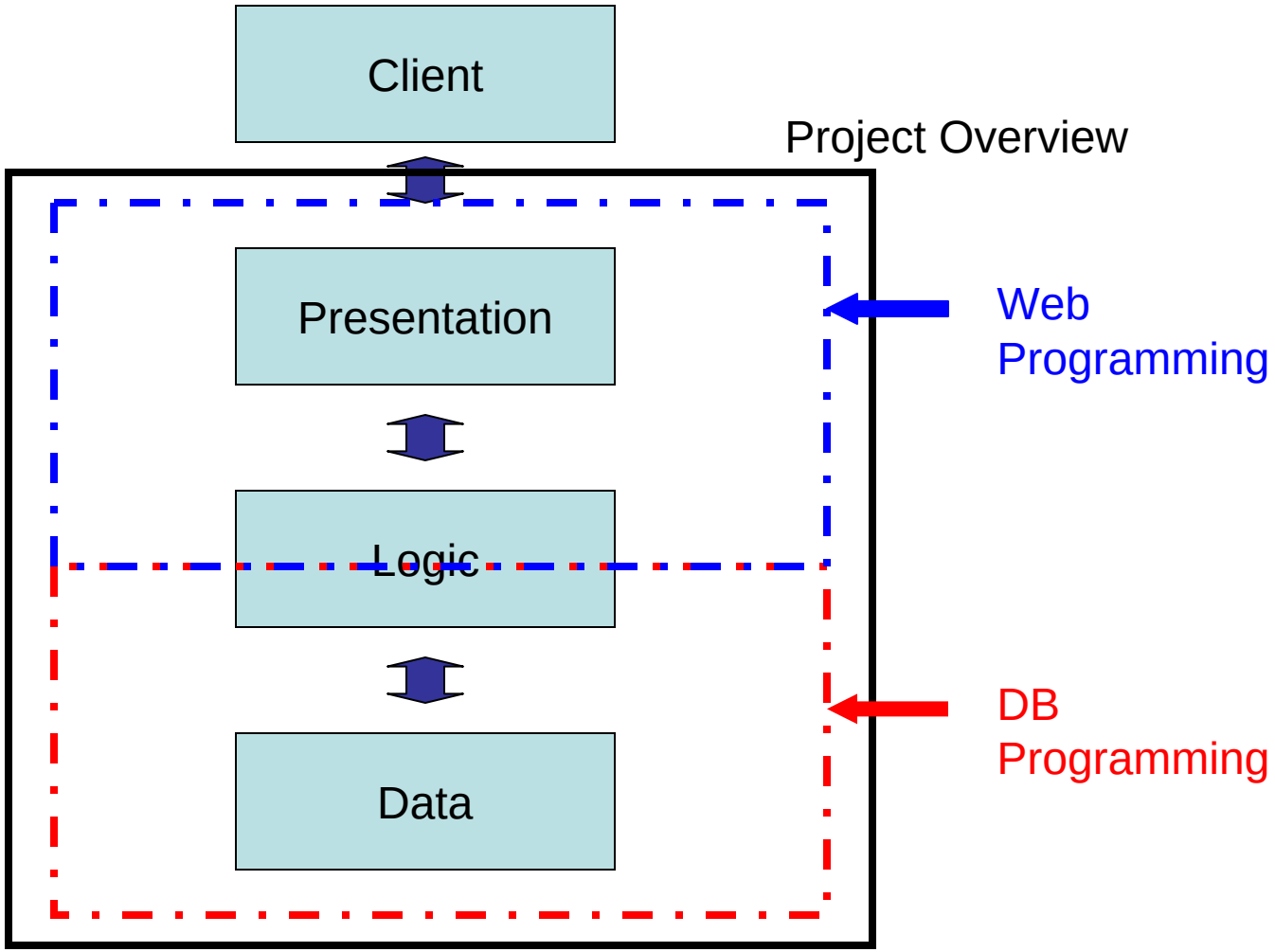


Common Tools for Building Web Apps

- Summary
  - Framework
    - LAMP
  - Client side
    - Examples: CSS, Flash, HTML, DHTML, javascript
  - Server side
    - Examples: ASP, Java, Perl, PHP, Python, Ruby
  - Web server
    - Examples: Apache, tomcat
  - Database
    - Examples: mysql, oracle, postgre
- Tool resources are on the Projects page (see Other Information)
  - Feel free to contribute!

Project Information: https://agora.cs.illinois.edu/display/cs411sp11/Course+Projects

We will help you with project tutorials.



Project Track 2:
System Project over Open Source DBMS

- Team work: a group of 3 or 4 people
- Propose and implement a novel feature on an open source database
  - Propose a novel feature for an open source DBMS system.
    - Define the input and output of your feature
  - Implement
    - Identify a DBMS to work on (e.g. SQLite http://www.sqlite.org/)
    - Identify components you need to change. (e,g, storage and executor)
    - Implement a basic function first and make it work
    - Improve your function for completeness
  - Demo & Report
- Milestone in 3 stages
  - https://agora.cs.illinois.edu/display/cs411sp11/Project+Track+2

Project Information: https://agora.cs.illinois.edu/display/cs411sp11/Course+Projects

Track 2: Your project must propose and implement a novel feature.

- Propose a novel feature or function!
  - The feature should involve modifying/adding at least one component into current database systems.
  - The feature should be integrated into a database system
    - Implemented within a database system instead of on top of the system
  - The feature should have clear input and output
  - The feature should be tested by various test cases
- Implement a basic function first
- Implement other support functions then

Project Information: https://agora.cs.illinois.edu/display/cs411sp11/Course+Projects

Track 2 Example: FreeDB

- FreeDB https://agora.cs.illinois.edu/display/cs511fa10/Group-FreeDB
- What's the feature?
  - Allow user to store data items without schema
- Basic function
  - Create a table without schema
- Support functions
  - Insert data item freely
  - Search the stored items

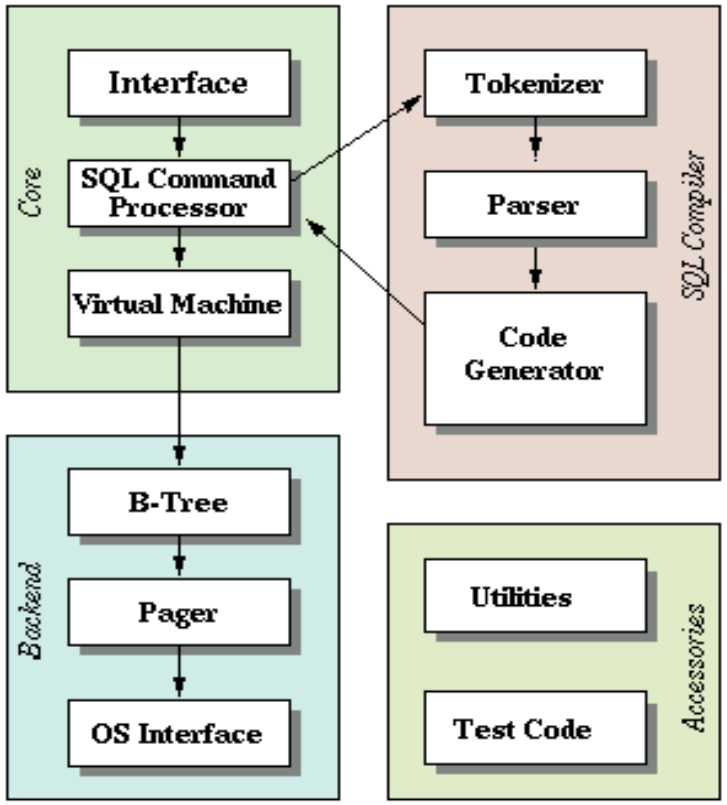
```
create table ITEM;
```

```
insert into
ITEM (item_id, item_desc, item_price)
values (102, "iPhone", 199.00);
insert into
ITEM (item_id, item_desc, item_price)
values (103, "iPad", 499.00);
select * from ITEM
where tag = "laptop";
```

Project Information: https://agora.cs.illinois.edu/display/cs411sp11/Course+Projects

Track 2 Example: FreeDB

- Open Source Database: SQLite
- Components modified
  - Parser
  - Code Generator
  - Virtual Machine
  - Storage components
- Implement the basic functions
  - Create
- Implement support functions
  - Insert
  - Search
  - Delete/Update?
- Specify your test cases



Project Information: https://agora.cs.illinois.edu/display/cs411sp11/Course+Projects

Track 2 Example: Sample Table

- What's the feature?
  - Allow calculation by sampling data from the table
- Basic function
  - Add Sample Command into "FROM Clause"
    - Select * From Sample(Number) Table
- Support functions
  - Add support to calculate average, count, join etc
    - Select Average(age) From Sample Student
- Implementation
  - Open Source database: SQLite
  - Components you need work on:
    - Modify the grammar to add support for parsing the SAMPLE clause
    - Modify the executor to add the sampling algorithm
    - You may want to modify the query optimizer (But it's not required)
  - Give your test cases for the feature

Project Information: https://agora.cs.illinois.edu/display/cs411sp11/Course+Projects

What are our expectations for track 2?

- Every stage must be approved before next
  - Stage 0 Group formation (Feb. 9, 2011)
  - Stage 1 Project plan (Feb. 18, 2011)
  - Stage 2 Initial demo (Mar. 18, 2011)
  - Stage 3 Final demo and report (Apr. 22, 2011)

Project Information: https://agora.cs.illinois.edu/display/cs411sp11/Course+Projects

What are our expectations for track 2?

Grading

- **Stage 1: Project Plan 10%**
  - Project topic: propose ONE specific feature of a DBMS that you plan to work on.
    - Please give the expected input and output
  - Describe the labor division among group members
  - A project timeline with milestones
- **Stage 2: Initial Demo 20%**
  - Show you are able to compile the open source database with your basic function
  - Specify components you have worked on and you need to continue working on
  - Give concrete examples or testing cases for your demo
- **Stage 3:**
  - **Final Demo 40%**
    - Run the basic function
    - Test the function with various test cases
    - Additional supporting functions
  - **Report 30%**
    - Explain the function you implemented and how implemented it.
    - Provide for testing cases for your demo
    - Lessons learned

We grade your project according to the amount work you have done

- Your proposal
- Your understanding of the implementation of current systems,
- The basic function and results of various test cases
- The completeness of your implementation.

Project Information: https://agora.cs.illinois.edu/display/cs411sp11/Course+Projects

Project Tips

- Read Projects page to get started
  - https://agora.cs.illinois.edu/display/cs411sp11/Course+Projects
- CSIL provides development environment
  - Database: MySql or Oracle
  - Web server: Apache (no Tomcat)
  - Tech help? TSG userhelp@cs.uiuc.edu
- Start early
  - “Unexpected issues”
  - Form groups now
- Backup your application
- Have a question? Got stuck?
  - Hanna (Project Track 1)
  - Rui (Project Track 2)

Project Information: https://agora.cs.illinois.edu/display/cs411sp11/Course+Projects

Questions?

Project Information: https://agora.cs.illinois.edu/display/cs411sp11/Course+Projects