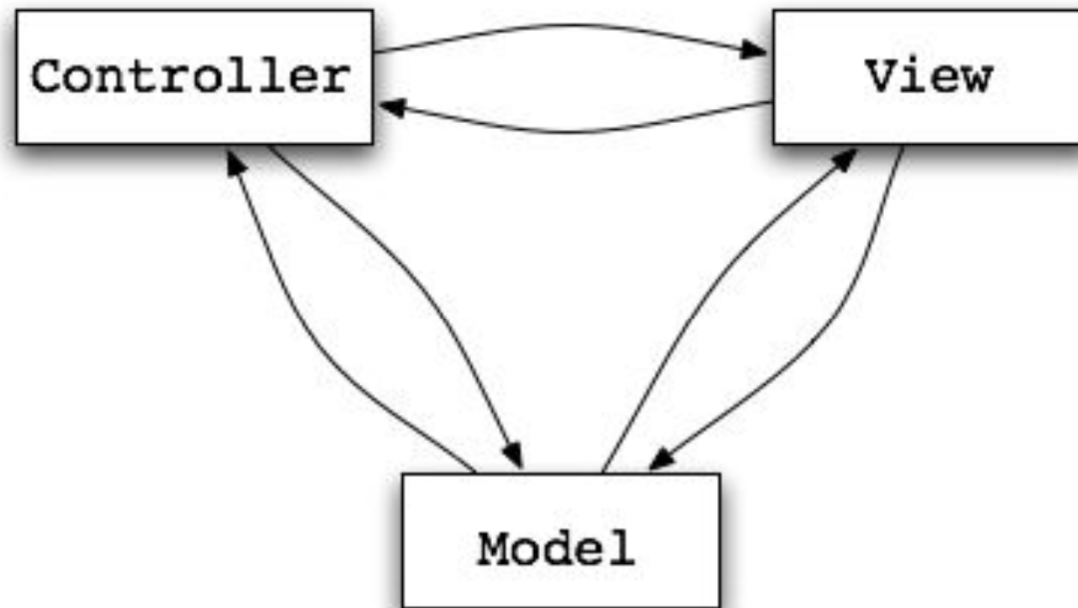# Introduction to
# Model-View-Controller (MVC)
Web Programming

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General 3 Tiered Architecture

- First tier: Client side code (Web-browser)
  e.g. (X)HTML, Javascript, Java, Flash
- Second tier: Server side code

  e.g. C/C++, Perl, PHP, Java, Ruby, Python
- Third tier: Server side Database Server
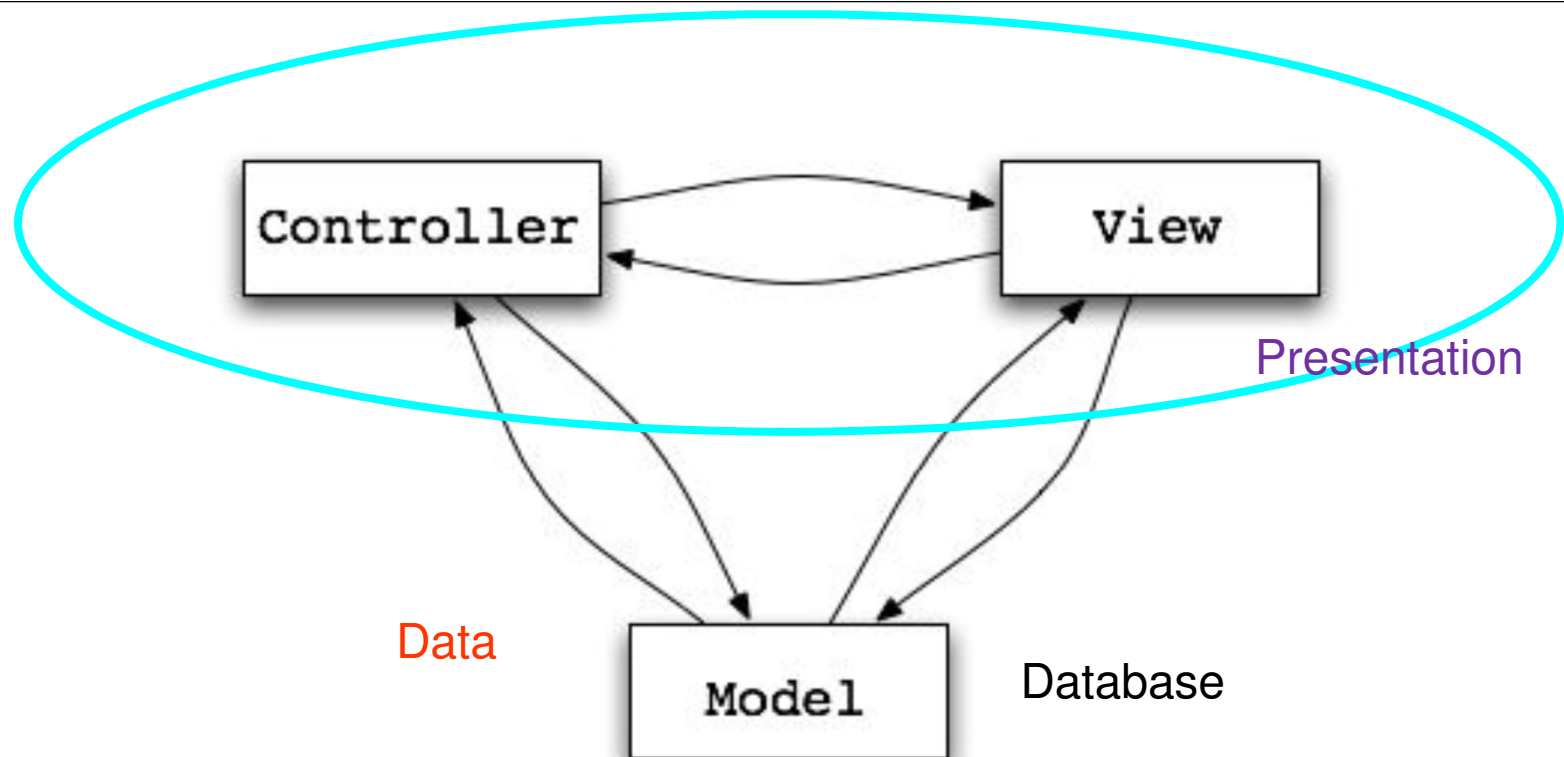
  e.g. RDBMS: MySql, MS SQL Server

  NoSQL: MongoDB

Model View Controller

- Architectural Pattern from Smalltalk (1979)
- Decouples Data and Presentation
- Eases the development

Server   Controller   View   Client
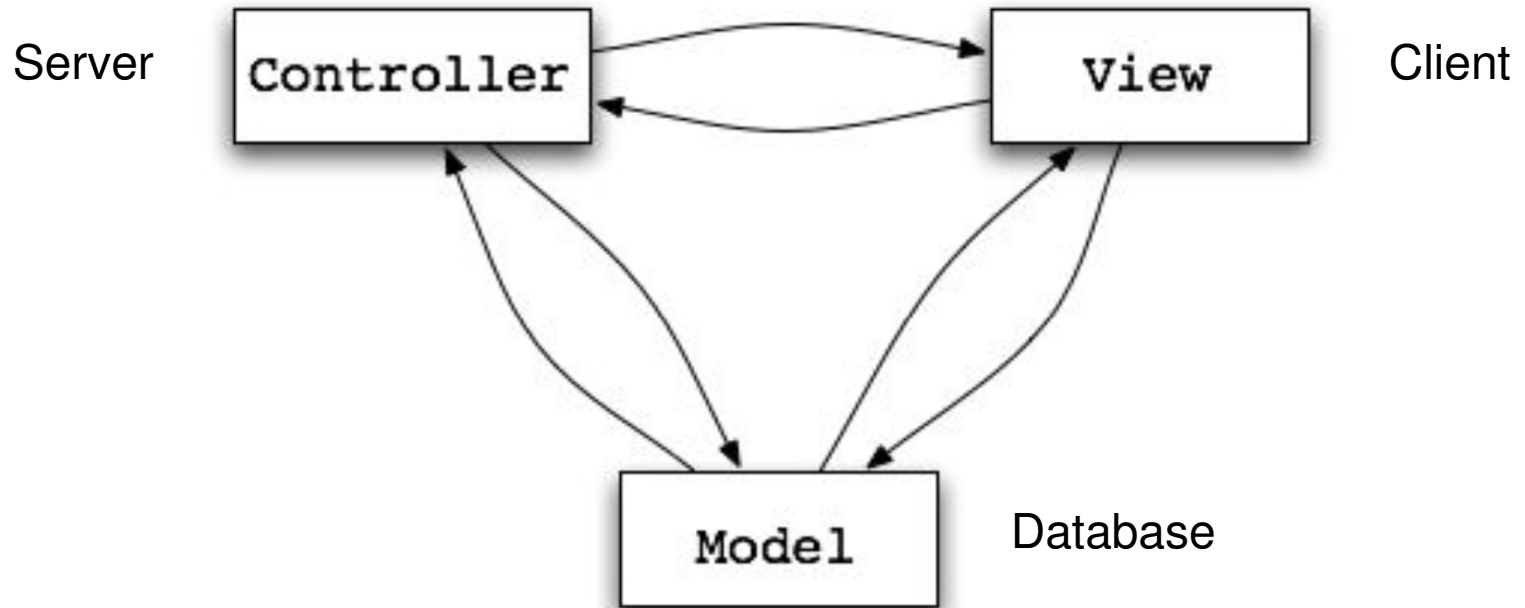
Model   Database

- **Tier 1: View (Client)**
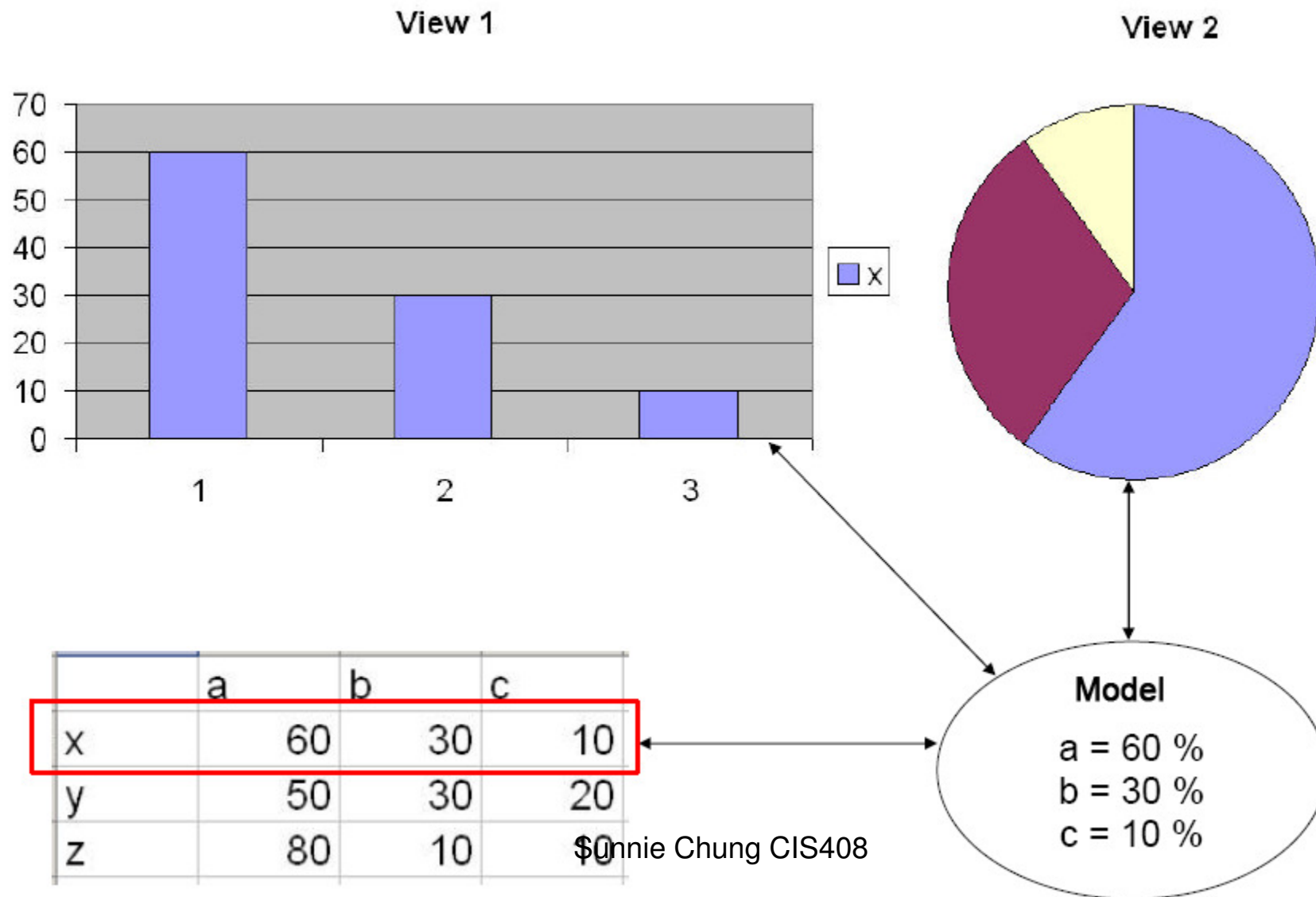- **Tier 2: Controller (Server)**
- **Tier 3: Model (Database)**

- Presentation:
  - View is the User Interface (e.g. button)
  - Controller is the Code (e.g. callback for button)
- Data:
  - Model is the Database

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Example Control Flow in MVC

- User interacts with the VIEW UI

- CONTROLLER handles the user input (often a callback function attached to UI elements)

- CONTROLLER updates the MODEL

- VIEW uses MODEL to generate new UI

- UI waits for user interaction

MVC – general example

View 1

View 2

Model

a = 60 %
b = 30 %
c = 10 %

	a	b	c
x	60	30	10
y	50	30	20
z	80	10	30

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Examples of Platform

Mochikit

JavaScript Library

VIEW

XHTML template engine

Kid

CONTROLLER

CherryPy

Easy to use Python Webserver

MODEL

SQLObject

ORM Database Interface
(e.g. for MySQL)

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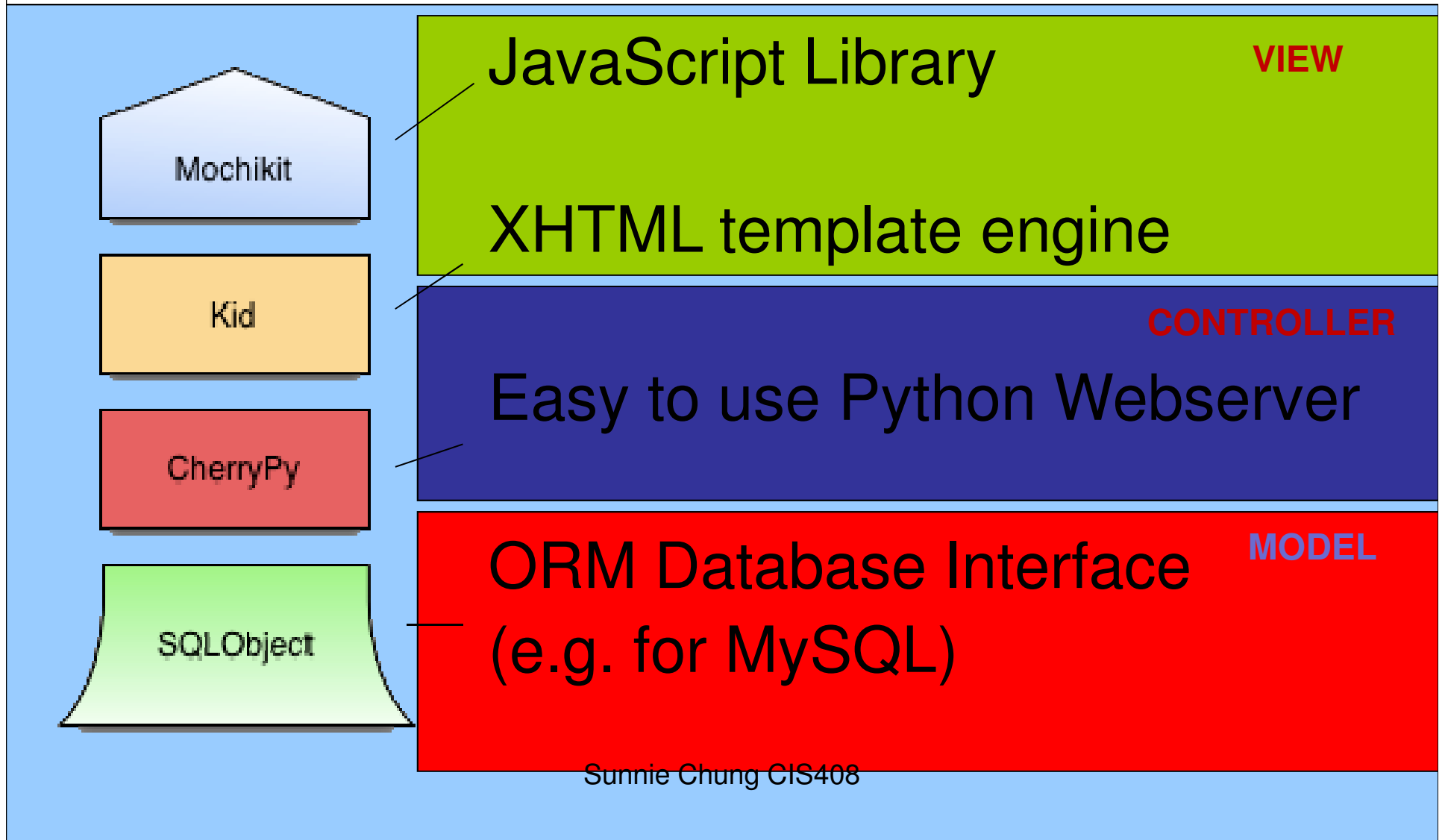
LAMP(Linux, Apache, MySQL)

Web cache

Squid
Polipo
Traffic server

Web server

Apache
Cherokee
Lighttpd
Nginx

CGI scripting

Perl
PHP
Python

Database

MariaDB
MySQL
Drizzle

Linux kernel

AppArmor
SELinux
Smack
TOMOYO

Process Scheduler

Netfilter
Linux network stack

Network scheduler

NIC
device
driver

kmod-fs-ext4
kmod-fs-btrfs
Lustre
...

Hardware

CPU
&
RAM

Networking
hardware

Storage

SATA
SAS
RAID
iSCSI
NAS

Attacks
stave off

&

Requests
serve

Responses
low latency

Environment: CCC

Crackers
Botnets for DDoS-attacks
cracking attempts

Competitors
compete for customers

Internet

Customers
want attendance

Botnets

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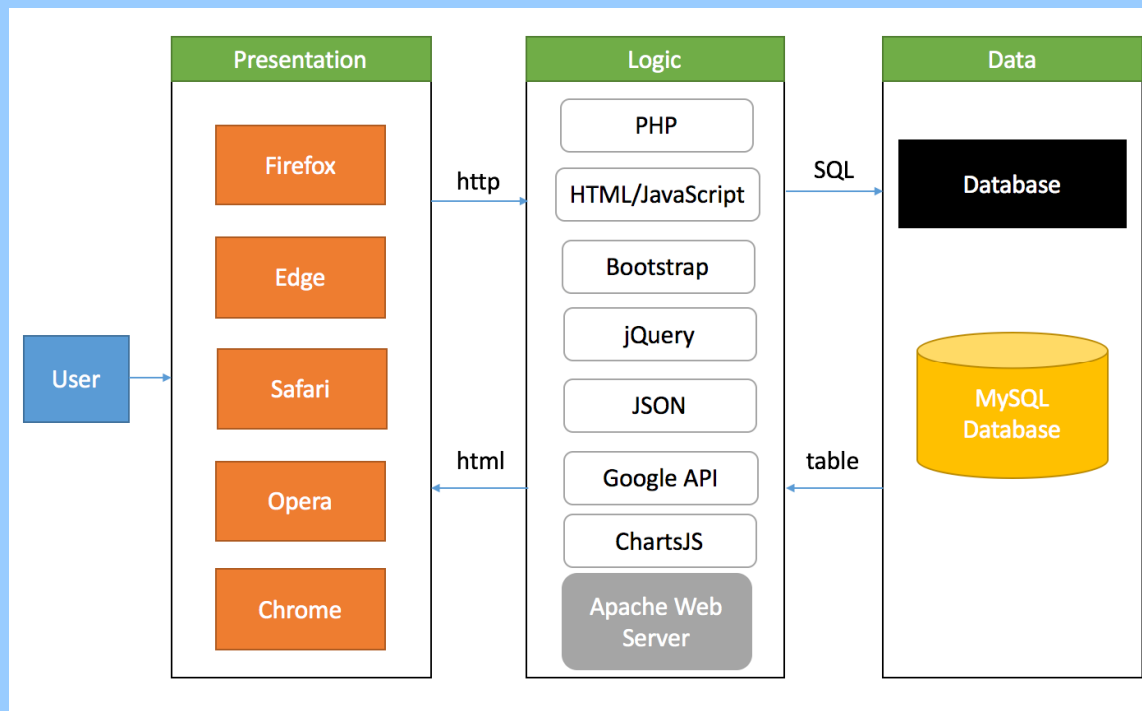
WAMP/LAMP Stack

- **Apache** Webserver and **PHP**
- **MySQL** Database Server on
- Window/Linux with **ODBC**

ASP.NET with MS SQL Server

- UI: WebMatrix, BootStrap

- IIS Web Server with Angular JS

  Internet Information Services (**IIS**, formerly **Internet Information Server**) is an extensible Web Server created by Microsoft for use with Windows NT family. **IIS** supports HTTP, HTTPS, FTP, FTPS, SMTP and NNTP.

- Visual Studio IDE .NET Framework for ASP Web Applications (C++/C#, JAVA) and XML Web Services

- Database Server : MS SQL Server

  with ODBC (for C++/C#) or JDBC for (JAVA).

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JAVA Platform

- UI: Java **Frame Work**

- Java **Frame Work** for Application Logic

- DB Server: Oracle/Any Relational Database Server with

- **JDBC (**Java Database Connectivity) API

- Linux/Window Platform

JAVA Script Framework:

- Node.JS for Webserver

- Anguar.JS for Client Side

- Bootstrap for UI

- MEAN Stack: with MongoDB

- NoSQL Database Server: MongoDB
  with Node JS API (e.g. Mongoose)

- Relational Database Server : e.g.MySQL
  with Node JS API (e.g. node-mysql)

Components Interaction During the Execution of a Database Query

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