Development Environments

WEB322: WEB PRGRAMMING TOOLS AND FRAMEWORKS

Prof. James Mwangi PhD.

Welcome

Lesson Objectives

- Introductions
- Know the Rules and Expectations
- MyApps Instructional Video
- Course Overview
  - ➢ Course website
  - ➢ Structure
  - ➢ Schedule
  - ➢ Evaluation
  - ➢ Development environments
  - ➢ Assignment 1

Course Overview

- Web322 builds on Web222

- Looks at tools and frameworks for programming the web.

Essential Terminology

• **Cloud Computing**

➤Using a network of remote servers hosted on the Internet to store, manage, and process data, rather than setting up and using a local server.

Cloud Computing

➢ **PaaS**: Platform as a Service. E.g. Heroku, AWS, Microsoft Azure.

➢ **IaaS**: Infrastructure as a Service. Pre-configured, virtualized hardware

➢ **SaaS**: Software as a Service. Using licensed and centrally hosted software.

• Web322 runs on Heroku PaaS. More info ahead

Essential Terminology

MVC Design Pattern

- A general reusable template for solving a particular software problem
- Independent of implementation details
- Based on the separation of concerns principle

➢ Model: data sources [databases + other data files

➢ Viewer: displays results on user interface

➢ Controller: handles transmission between data model and views

- Web322 adopts Express.js → an MVC-based framework

Development Environments

- Programming language – do we one or many?

- Development Frameworks

- Templating Engines

- Code editors

- Testing and Debugging Tools

- Transmission servers host servers

- Operating System

- Server-side vs Client-side tools

- Scripting tools – Mark-up and Presentation tools

Development Environments

- Heroku
- Node.js
- Express.js
- Handlebars.js
- MongoDB
- PostgressSQL
- Visual Studio Code

Heroku

Our Development PAAS

Heroku PaaS

- A Platform As A Service with tools to develop, test, and deploy a web application.

- automates all of the requirements and infrastructure required to run and host a web application.

- Based on Amazon Web Services (AWS) model. Offers a free starter account.

Node.js

The Runtime Environment

Node.js

- Unifying A runtime environment that unifies web programming around one programming language namely JavaScript

- Runs JavaScript server-side.

- Based on Chrome's V8 runtime engine – more later

- Recall Web222 client-side JavaScript language

Express.js

The Development Framework

Express.js

- A minimalistic web development framework based on nodes.js
- Based on the MVC design pattern
- More to come

Handlebars.js

The Templating Engine

Handlebars.js

- A templating engine that provides link between models and views

- Other templating engines exist: EJS

- Block helpers make it possible to *define* custom iterators and other functionality that can invoke the passed block with a new context.
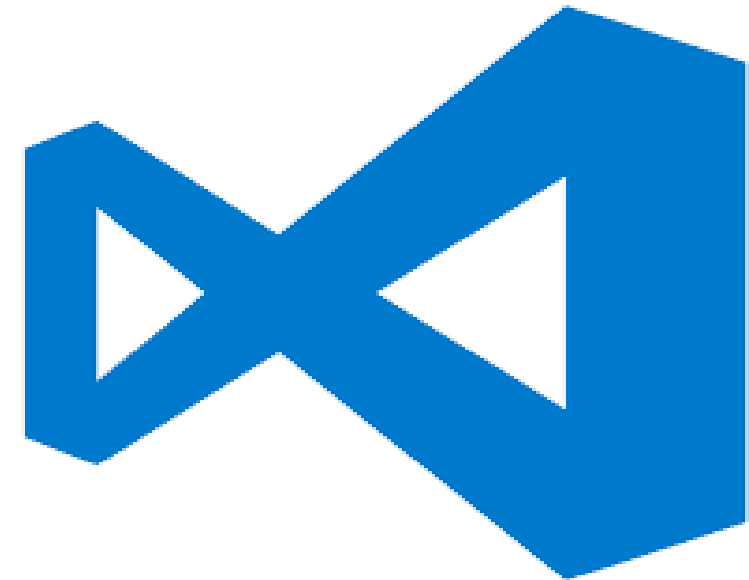
- More on that later

Visual Studio Code

The Coding Editor

Visual Studio Code

- The official code editor for WEB322.

- Others exist – Sublime text, NotePad++

- Use Visual Studio Code in all your web322 assignments

- Enjoy built-in support for IntelliSense

code completion, rich semantic **code**

 understanding and navigation,

and **code** refactoring. And when

the coding gets tough, the tough get

debugging. Debugging is often the

one **feature** that developers miss most
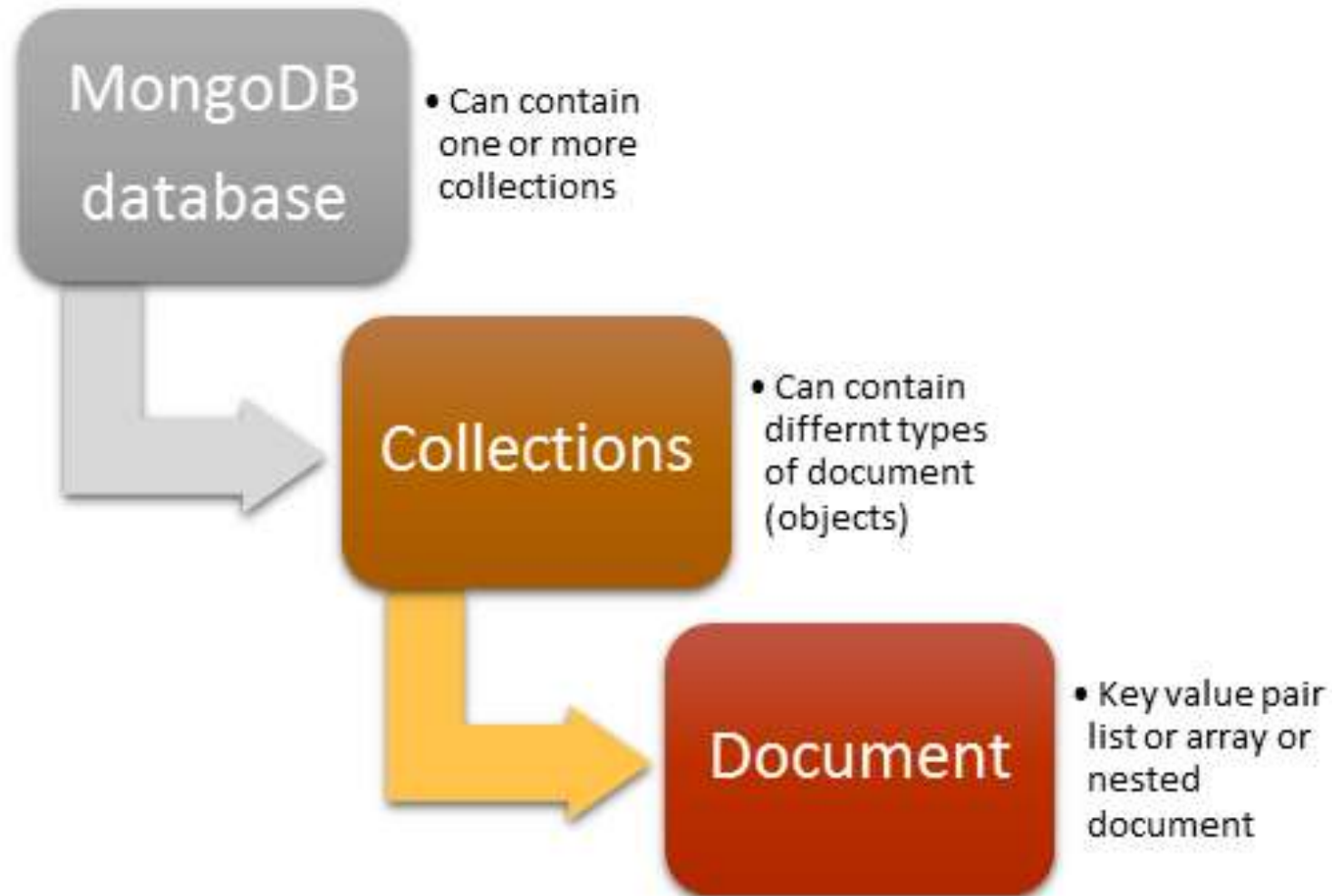
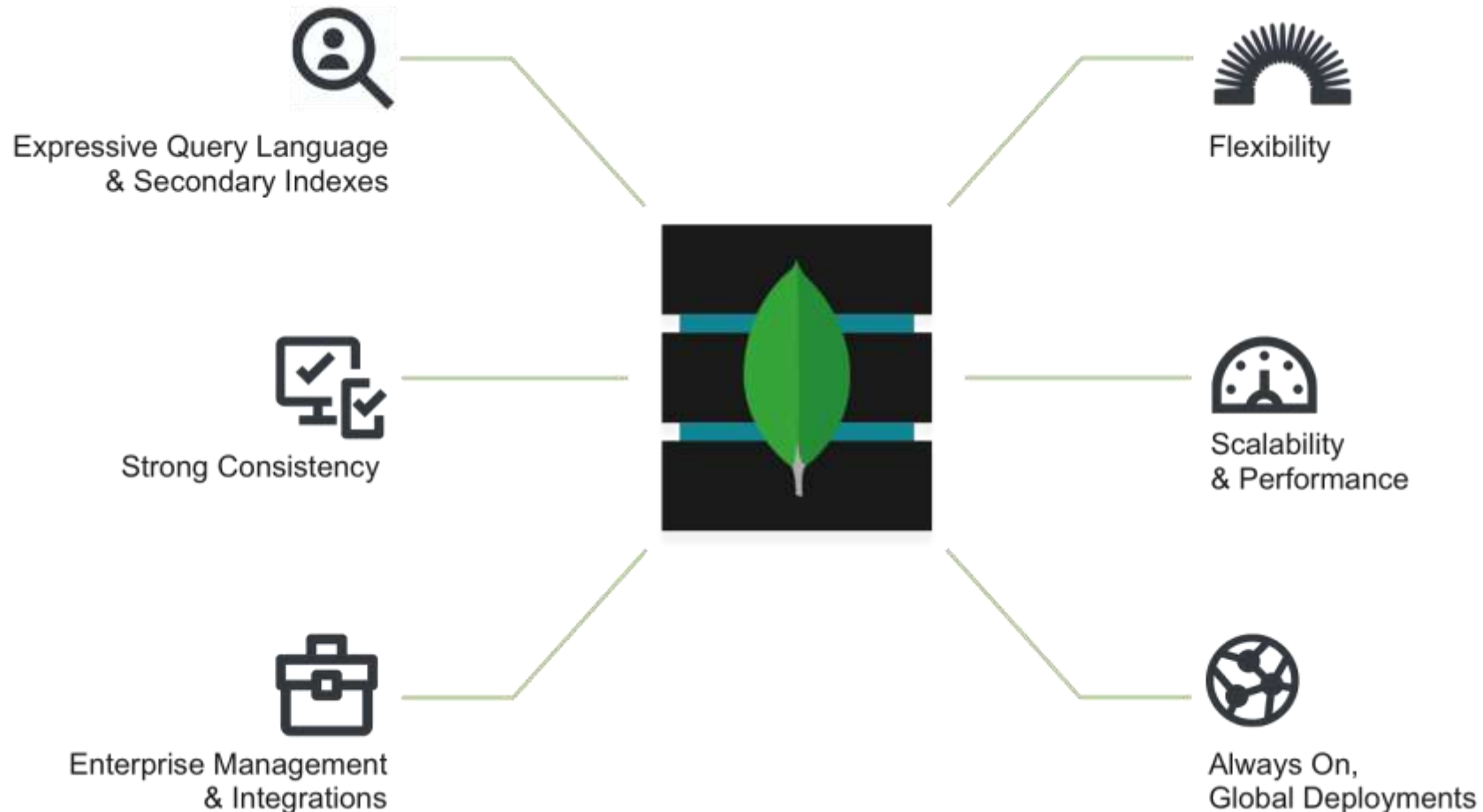 in a leaner coding experience, so we made it happer

MongoDB

The Data Model
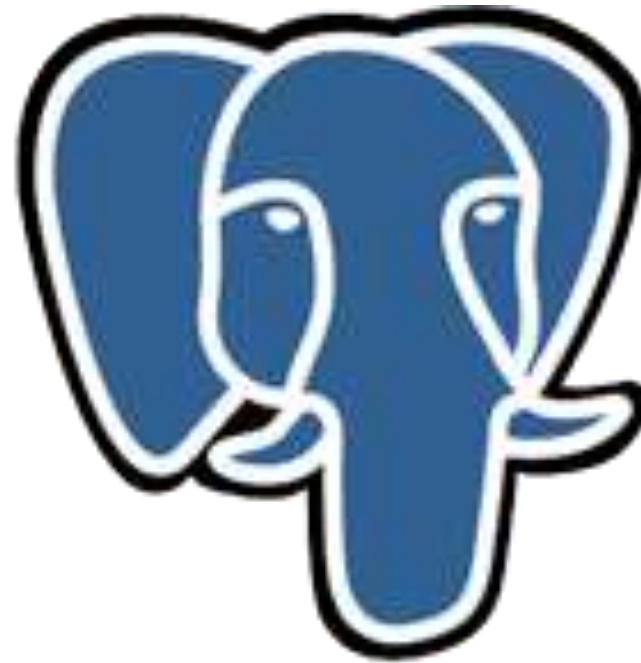
MongoDB vs Conventional DBs

MongoDB

- We will look at more of these No-SQL database

Expressive Query Language & Secondary Indexes

Flexibility

Strong Consistency

Scalability & Performance

Enterprise Management & Integrations

Always On, Global Deployments

PostgreSQL

- An open source relational database management system (DBMS) database

- Object-based

  with SQL support.

PostgreSQL

- PostgreSQL, often simply Postgres, is an object-relational database management system with an emphasis on extensibility and standards compliance.

- As a database server, its primary functions are to store data securely and return that data in response to requests from other software applications.

- It can handle workloads ranging from small single-machine applications to large Internet-facing applications with many concurrent users;

- On macOS Server, PostgreSQL is the default database; and it is also available for Microsoft Windows and Linux.

GitHub

version control repository and Internet hosting service

GitHub

GitHub

- GitHub is a web-based Git or version control repository and Internet hosting service. ... It offers all of the distributed version control and source code management (SCM) functionality of Git as well as adding its own features.

- Continuous use will build experience

Setting Up Development Environments

To set up your development platform

- Head to blackboard
- Course Documents link
- Course Website

- **Assignment 1:** Posted on BB under Assignments link