Day 1

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Amazon Web Services

Cloud computing platform provided by amazon
- provides us with access to db's, servers, and other storage

Advantages
- Pay as you go
- Lower costs because of economies of scale
- Automatically scale up and down
- Easily and quickly allocate resources
- Less start up cost
- Deploy globally in seconds

Cloud Computing models

Infrastructure as a Service (IaaS)
- self service model for servers/remote data centers

Platform as a Service (Paas)
- allows organizations to run, manage, and build applications
  - AWS role

Software as a Service (SaaS)
- replaces traditional on device software with based subscriptions

AWS Regions vs Availability Zones

Region: geographic location with a collection of availabity zone

Availability Zone: is a physical data center

AWS RDS

Relational Database Service
- service that makes setting up and managing relational databases easier

- cost efficient, resizable capacity for industry standard db's
- manages administrative tasks such as backups

SQL Overview

Database - a collection of structured data
- Typically stored in tables
  - tables are made of rows and colums
    - row is particular entry
    - colum describes the data

Primary Keys
- Unique identifiers for each entry in a table
  - each row will only have one primary key
  - each table must have a primary key column

DBMS vs RDBMS

DBMS: Database management System
- used to store and manage databases
- the ultimate goal of databases/dbms is to persist info

RDBMS: Relation Database Management System
- Used to manage relational db's
- Using these in training
- Relational databases store information in tables with relation to one another
- RDBMS are structured in a way to maintain the security, accuracy, intregrity, consistency of data

SQL: Structured Query Language
- Underlying language to query relational databases
- Not a programming language
- English like syntax

The exact syntax depends on the vendor
Vendors are specific RDBMS's
- Oracle

- Postgres
- MySQL
- Microsoft SQLServer

Postgres Datatypes

The tables in db's will have some attributes describing what is being stored, the attributes will have some datatype

Common Datatypes:
- boolean (bool)
- character (char[n]): describes a fixed size character string
- character varying (varchar[n]) describes a string of characters of varying length, n = maxLength
- date: calendar date
- integer (int): whole number
- numeric/decimal: decimal numbers

Defining Schemas:
- the formal structure of the database
  - includes all the tables and how they relate
  - any users allowed to use that db

We can map the schema using Entity Relationship Diagrams

ERD (Entity Relationship Diagram)
Three main components

Entities: your tables

Attributes: columns of your tables

Relationships: how the tables are related

Constraints:
restrictions we place on our table columns

Constraints:
restrictions we place on our table columns
- allow us to enforce rules/restrictions on our schema

Some constraints:
- Composite key: a key that uses more than one column
- not null: column must always have data
- unique: no two records can have the same data in that column
- primary key: denotes a primary key
- foreign key: denotes a reference to a different table
- Identity: a way to autogenerate primary keys