CSC 365-07: Introduction to Database Systems **Spring 2023**

Lecture 1: Database and DBMS

Instructor: Alex Dekhtyar *Ishaan Sathaye*

Introduction

Definition of a database and DBMS in Professor Notes.

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Lecture 2: Relational Data Model

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Relational Data Model

Definition 1 *Relational data model is an approach to organizing collections of data*

- Relation
  - Relational Table $\longrightarrow$ **Name + Schema**
    - Schema: List of attribute name + attribute type pairs
- Relational Database $\longrightarrow$ **Collection of Relations tables**
- Table Instance

One unit of data is called a **datum**.

Object, entity, event: description of one object, entity, event

- **Records** consist of attributes or fields (rows in the table).
- **Attributes** is a named container for a value of a specific type.

Database Table Constraint

Definition 2 *Limitations of table instances*

- Candidate Key: set or lists of attributes that uniquely define a record in a table, **minimal such set of attributes**, made up of multiple attributes sometimes.

Examples

CSC 365 Example

Course Object:

- Prefix: CSC $\longrightarrow$ **String**
- Course #: 365 $\longrightarrow$ **Integer**
- Name: Introduction to Database Systems $\longrightarrow$ **String**
- Description: Basic Principles, ... $\longrightarrow$ **String**
- Units: 4 $\longrightarrow$ **Integer**

Department Object:

- Name: Computer Science and Software Engineering
- Abbreviation: CSSE
- Building: 14
- Room: 245
- College: CENG

Stringing these objects together based on relationship would make a **network model**.

Schema Example

```
Course(Prefix String, Course# Integer, Name String, Description
String, Units Integer)
```

Prefix	Course#	Name	Description	Units
CSC	365	Introduction to Database Systems	Basic Principles, ...	4
CSC	357	Systems Programming	...	4

```
Department(Name, College, Building, Room): Department would also have a table as well.
```