# CSC343 Introduction To Databases

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## 1 Introduction

**what is data?** Bits that represent values e.g. numbers, strings, images, etc

in fact, instead of using "flat" files that store data with a keyword then data, we need a better system for more organized, optimized data.

**Databases and DBMSs**

- DBMS (Database Management System): a powerful tool for storing, addition, deleting, and simply operating on data in a fast and organized fashion
- Database:

**Data Models**

- Every DBMS is based on some data model: a notation for describing data including the structure of the data, constraints on the contents of the data (endpoints, all possible values), and operations on the data (specific searches, parameters, etc.).
- we will be mainly working with relational data model

**The relational Data Model**

- main concept is a "relation" derived from the mathematical concept, where a relation is a set of couples
- think of it as tables of rows and columns

**What DBMS provides**

- ability to specify the logical structure of data explicitly and have it enforced.
- ability to query or modify the data
- good performance under heavy loads
- durability of data, keeping it safe and intact. data integrity

- concurrent access by multiple users/processes (suppose tables A and B are bank accounts, we have a couple of queries that remove 100 from A then deposit that amount in B. what happens if another user checks A before the 100 is removed and B after the 100 is deposited?)

**Architecture of a relational DBMS**

- the DBMS sits between the data and the users or betweeb the data and an application program
- within the DBMS are layers of software:
  - parsing queries,
  - more but he turned the slides too quickly