What is a Database?

In this lesson we will discuss the basics of databases and their properties.
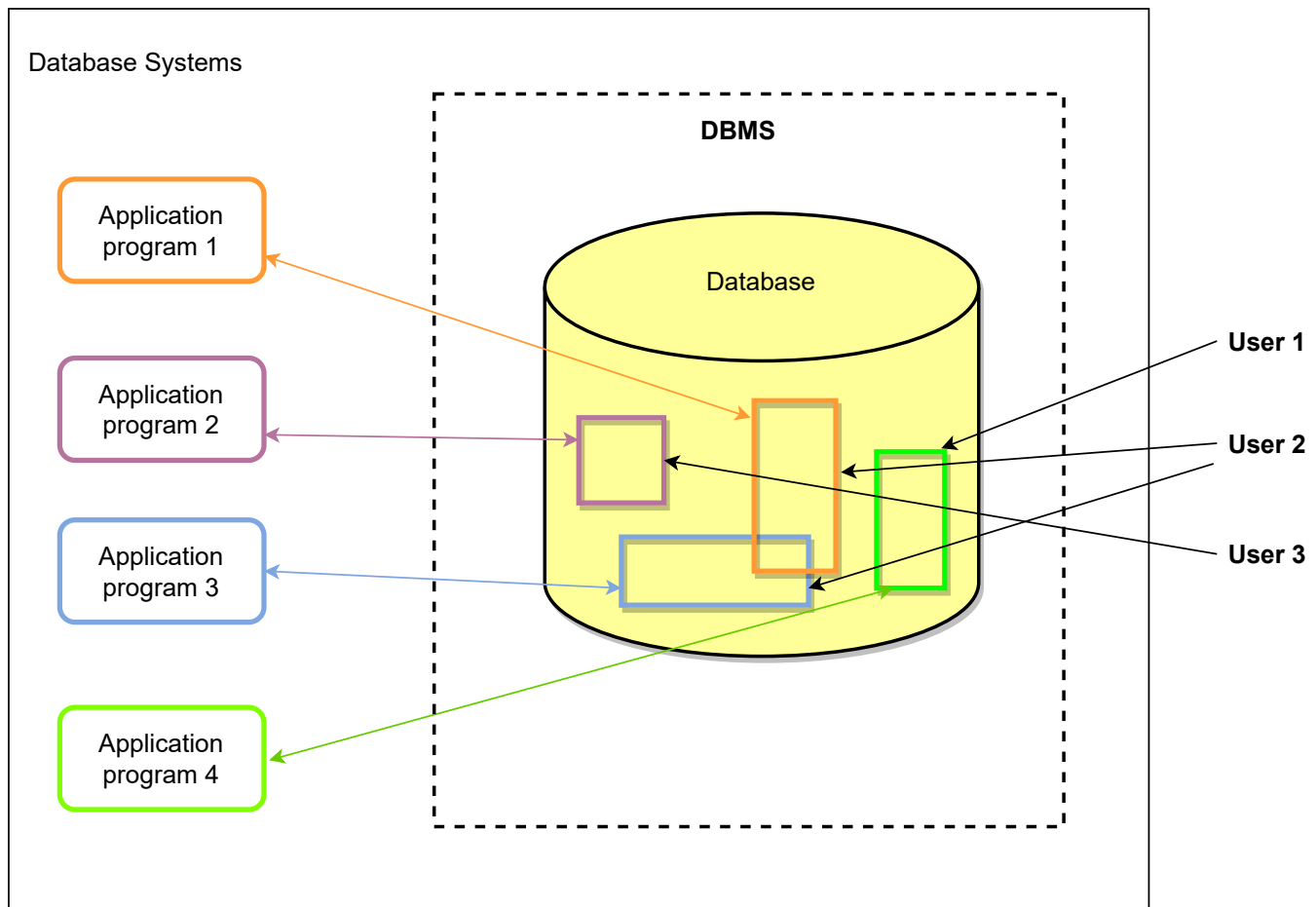
> **We'll cover the following** ⌃
> - What is a database?
> - Database properties
> - Examples of databases

What is a database?

A database is a shared collection of related **data**. By **data,** we mean known facts that can be recorded and that have implicit meaning. For example, consider the names, telephone numbers, and addresses of the people you know.

A database can be viewed as a repository of data that is defined once and then accessed by various users as shown in the figure below:

Database Systems

DBMS

Database

Application program 1

Application program 2

Application program 3

Application program 4

User 1

User 2

User 3

The application programs are nothing more than softwares that allow different users to send or retrieve data from the database.

Database properties

A database has the following properties:

- A database represents some aspect of the real world, sometimes called the mini-world or the **universe of discourse** (UoD). Changes to the mini-world are reflected in the database.

- A database is a **logically coherent collection of data** with some inherent meaning. A random assortment of data cannot correctly be called a database. For example, a list of random names cannot be considered a database but if we also note down those peoples' addresses and phone numbers, then the data will have some inherent meaning (i.e. it will be an address book).

- A database is designed, built, and populated with **data** for a **specific** purpose. It has an intended group of users and some preconceived applications in which these users are interested. For example, a department in a university might be interested in gathering data

department in a university might be interested in gathering data regarding the students' GPA so that they can finalize the dean's honor list.

In other words, a database has some degree of interaction with events in the real world and an audience that is actively interested in its contents. The users of a database may perform some transaction or events may happen. For example, a student's marks are increased on an exam, which causes the information in the database to change. For the database to be considered reliable these changes must be reflected in the database as soon as possible, so it can remain a true reflection of the mini-world that it represents.

Examples of databases

A database can be of any size and complexity. Let's consider the previous example of the list of names and addresses. This database may consist of only a few hundred entries with simple text information.

On the other hand, consider a database maintained by a social media company such as Twitter, which has millions of users. The database has to maintain information on which users are related to one another in the form of *followers*, the content posted by each user, and a large number of other types of information needed for the correct operation of their website. For such websites, a large number of databases are needed to keep track of the constantly changing information required by the social media website.

In the next lesson, we will look at the basic concepts behind a Database Management System.