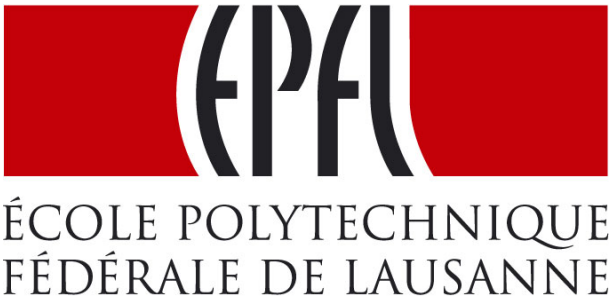
Ecole Polytechnique Fédérale de Lausanne

Notes de Cours en

# Introduction to Database Systems




Olivier Cloux

Spring 2017

# Contents



# 1 Introduction

Data is facts, a basis for reasoning. MIght be useful or redundant. Data in a database give information has a meaning and is relevant to the problem ; this leads to knowledge. Database are everywhere, from bank, to internet and science.

Data worldwide is growing exponentially of exponentially. We estimate to 40 zetabytes of data in 2020. Giants like YouTube are on the scale of several petabytes per minutes.

In the 2015 stackoverflow survey, SQL comes as the second most important technology (48% of voters).

**Definition 1.** A **Database management System** is a software system designed to store, manage and facilitate access to database.

A DBMS provides efficient, reliable, convenient and safe multi-user storage of and access to massive amounts of persistent data.

**Definition 2.** A **Database** is a large, integrated, structured collection of data. Usually intented to model some real-world enterprise.

**Example 1.** Consider a University. We could have databases of courses, students, professors,... Those are **entities**. On the other hands, databases of enrolments, teaching,... are **relationships**.

In this course, we will see how to design and build a database application. Above a DBMS. We will also take a detailed look "under the hood" of a DBMS.

## 1.1 DBMS Design and Architecture

We first need to describe data. We begin by choosing a **data model**, that describes our data. rajouter

When describing our data, we have several levels of abstraction. rajouter