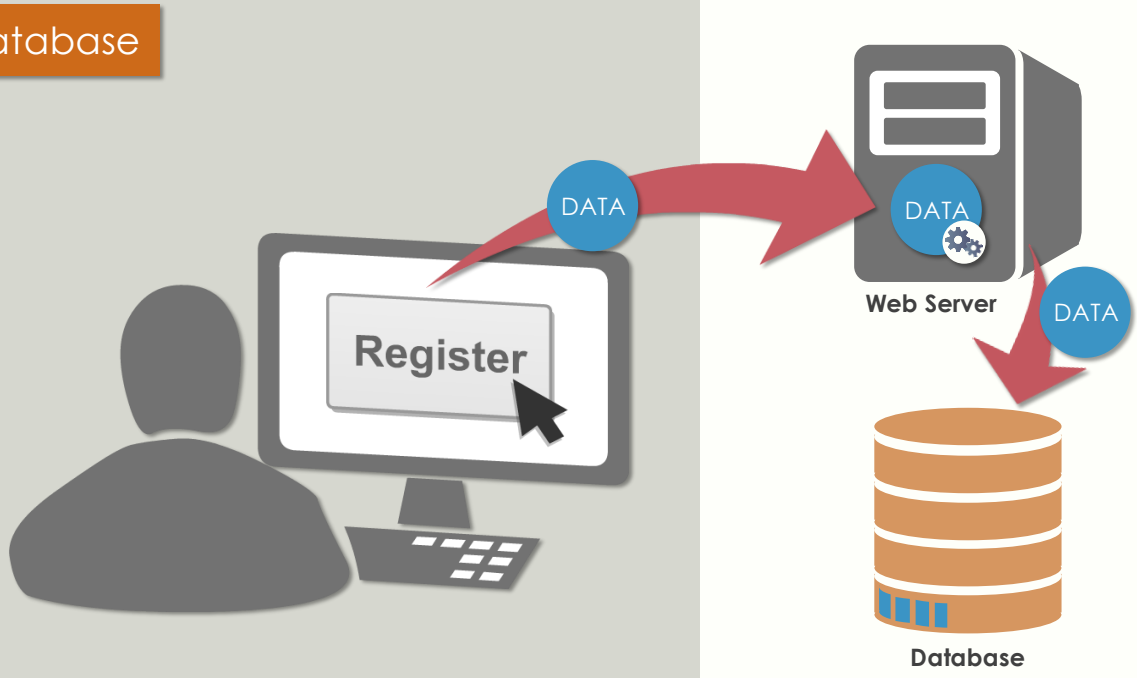
Introduction

Database

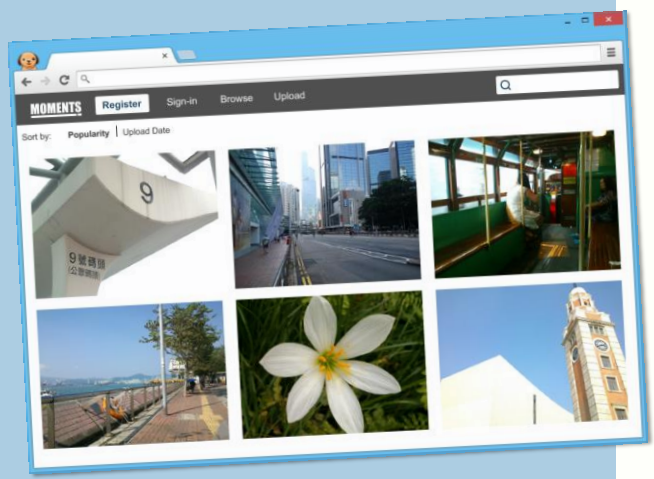


Database

Database stores

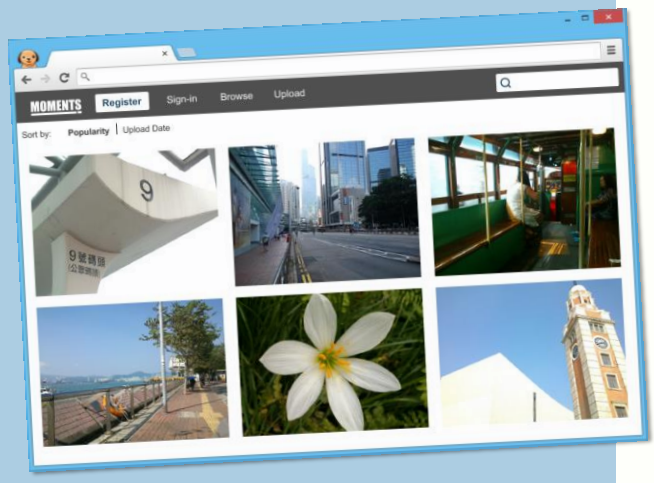
long-term persistent data

Database



Example:
MOMENTS online photo album

Database

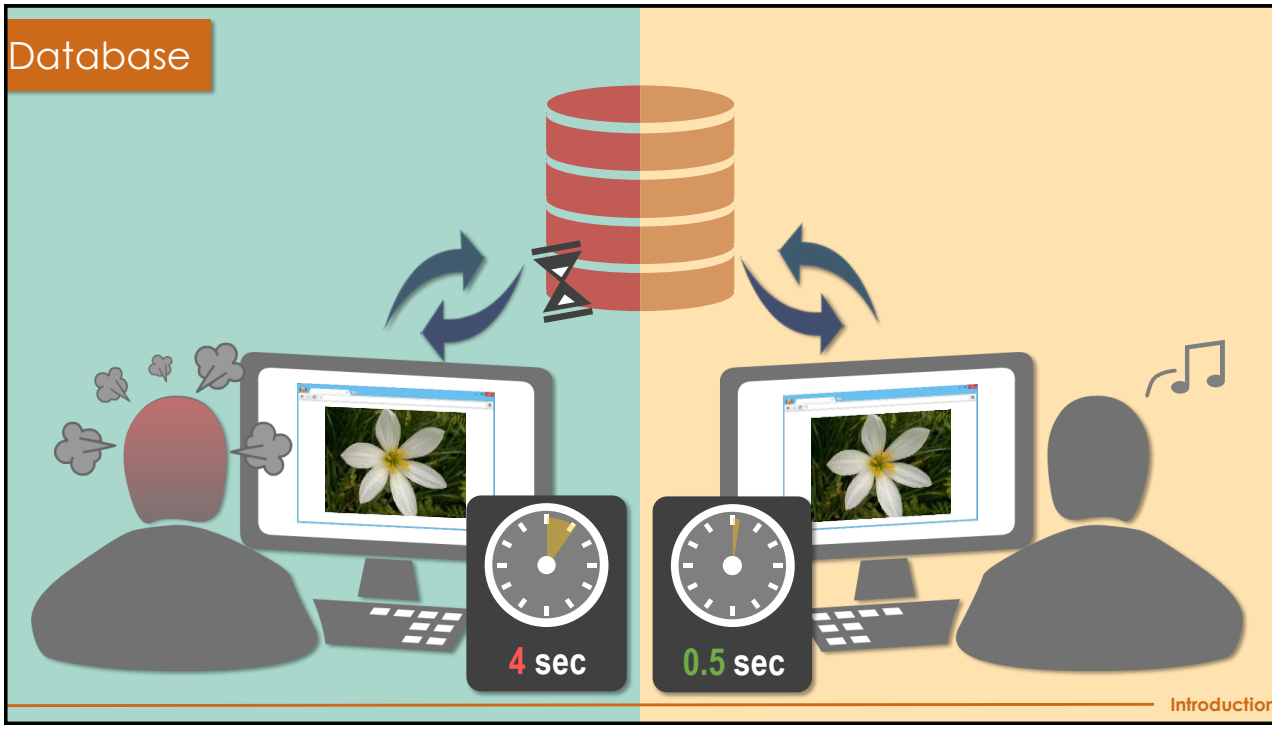


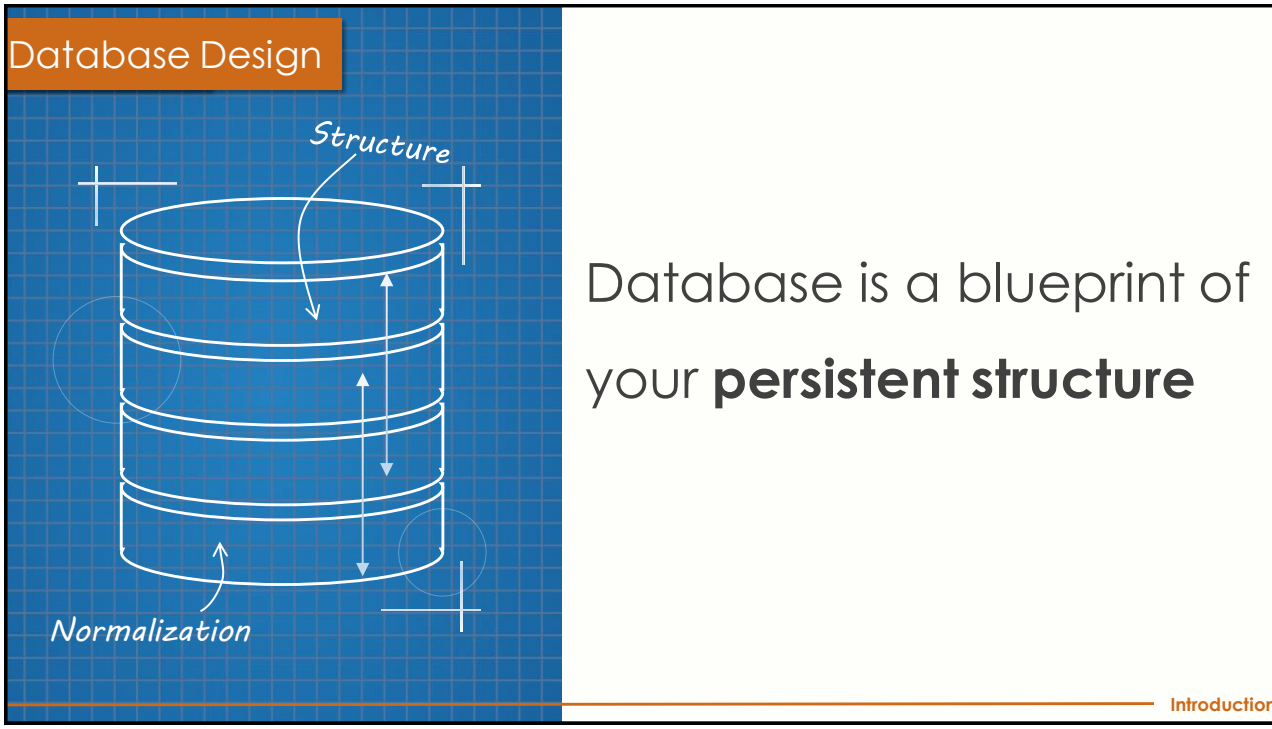
Persistent data:

- Photos
- Uploaders info.
- Albums
- Upload history
- Comments

Database

Database performance influences **software performance**

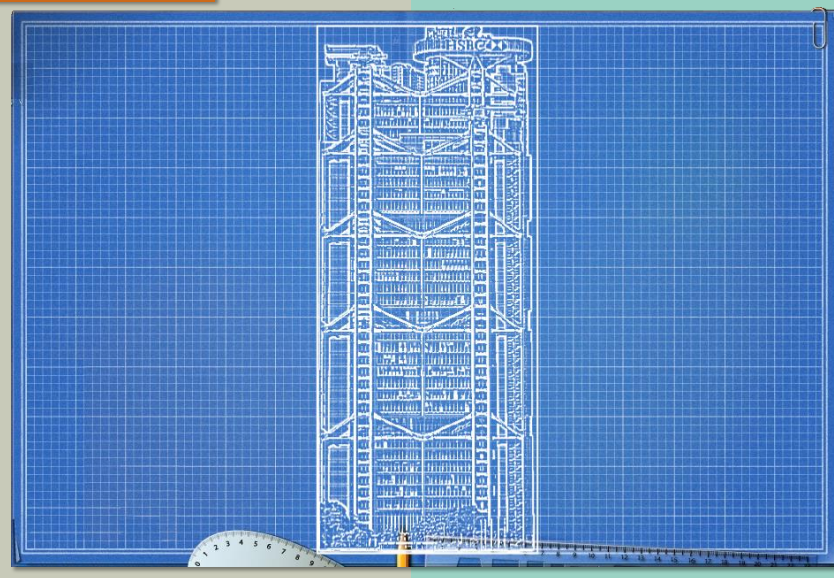

Database
4 sec
0.5 sec
Introduction


Database Design
Structure
Normalization
Database is a blueprint of your **persistent structure**
Introduction

Database Design - Why

Database Design - Why

Database Design - Why

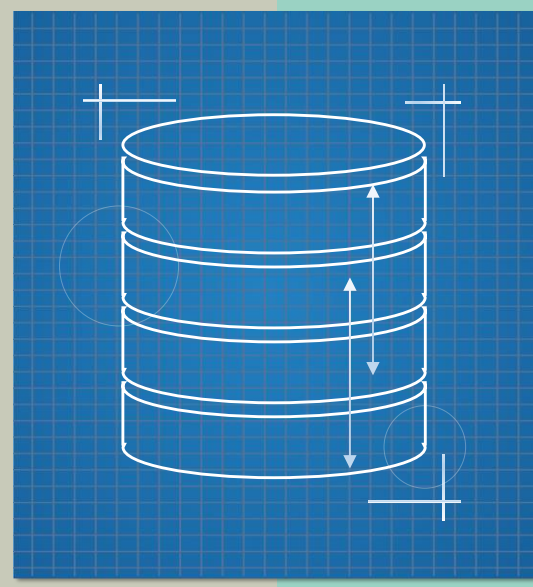


Database Design - Why

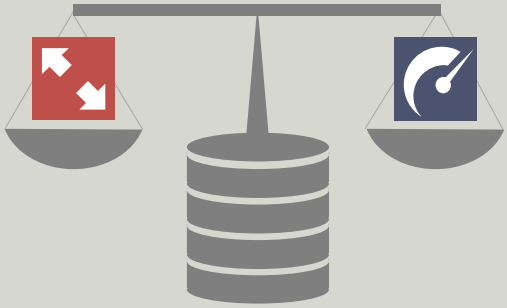
```
My Tic-Tac-Toe results:

Game 1: Win
Game 2: Win
Game 3: Draw
Game 4: Lost
Game 5: Win

Press any key to continue…
```

Database Design - Why

Database Design - Why

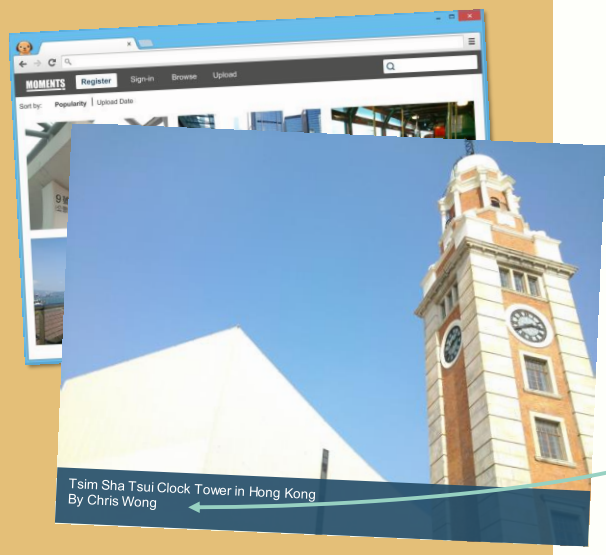


Database Design – Goal



Maintain a balance between **DB size** & **performance**

Database Design – Goal



How **uploader**'s details are stored?

Database Design – Goal

Photo and Uploader details in one table

ID	Title	Uploader Name	Uploader PhoneNum	Uploader Address
1	The tram	Chris Wong	252-608-5628	572 Lost Lake Crossing
2	Little kitten	Chris Wong	252-608-5628	572 Lost Lake Crossing
3	Chamomile	Chris Wong	252-608-5628	572 Lost Lake Crossing
4	New bus route	Wanda A. Allison	808-839-2217	2017 Green Impasse
5	Ferry pier 9	Chris Wong	252-608-5628	572 Lost Lake Crossing
6	The coast	Chris Wong	252-608-5628	572 Lost Lake Crossing
7	Rock climbing	Wanda A. Allison	808-839-2217	2017 Green Impasse
8	Fountain	Chris Wong	252-608-5628	572 Lost Lake Crossing
9	Sunset	Wanda A. Allison	808-839-2217	2017 Green Impasse

Database table: **Photo**

Introduction

Database Design – Goal

Access both **photo** and **uploader** details when querying a single record

ID	Title	Uploader Name	Uploader PhoneNum	Uploader Address
1	The tram	Chris Wong	252-608-5628	572 Lost Lake Crossing
2	Little kitten	Chris Wong	252-608-5628	572 Lost Lake Crossing
3	Chamomile	Chris Wong	252-608-5628	572 Lost Lake Crossing
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8	Fountain	Chris Wong	252-608-5628	572 Lost Lake Crossing
9	Sunset	Wanda A. Allison	808-839-2217	2017 Green Impasse

Database table: **Photo**

Introduction

Database Design – Goal

However, this may create a lot of **redundant** data

ID	Title	Uploader Name	Uploader PhoneNum	Uploader Address
1	The tram	Chris Wong	252-608-5628	572 Lost Lake Crossing
2	Little kitten	Chris Wong	252-608-5628	572 Lost Lake Crossing
3	Chamomile	Chris Wong	252-608-5628	572 Lost Lake Crossing
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8	Fountain	Chris Wong	252-608-5628	572 Lost Lake Crossing
9	Sunset	Wanda A. Allison	808-839-2217	2017 Green Impasse

Database table: **Photo**

Introduction

Database Design – Goal

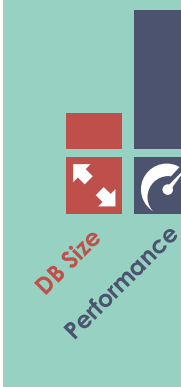
ID	Title	Uploader ID
1	The tram	1
2	Little kitten	1
3	Chamomile	1
4	New bus route	2
5	Ferry pier 9	1
6	The coast	1
7	Rock climbing	2
8	Fountain	1
9	Sunset	2

Database table: **Photo**

ID	Name	PhoneNum	Address
1	Chris Wong	252-608-5628	572 Lost Lake Crossing
2	Wanda A. Allison	808-839-2217	2017 Green Impasse

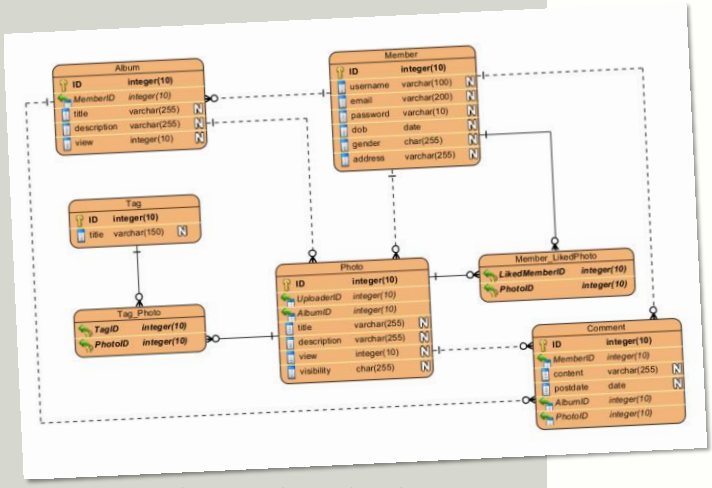
Database table: **Uploader**

Photo and Uploader details in **separate tables**



Introduction

Database Design Notations

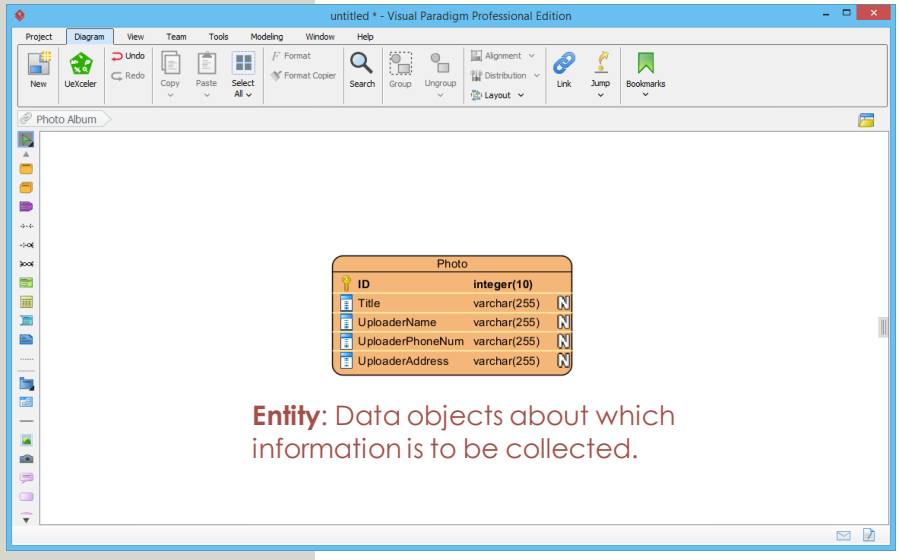


Entity Relationship Diagram (ERD)

Entity Relationship Diagram is:

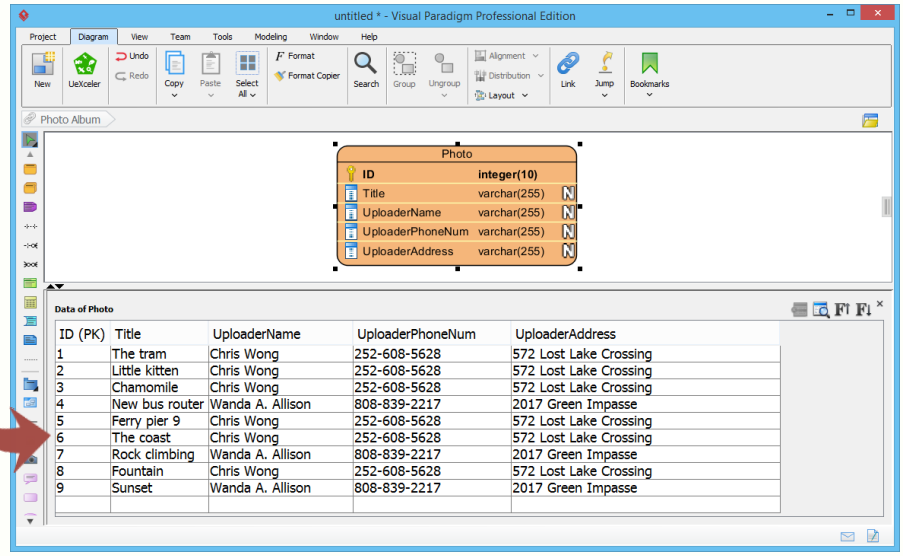
- Language for expressing database
- Visual language
- Facilitate communication
- Presents data structure & inter-relationships

Database Design Notations



Entity: Data objects about which information is to be collected.

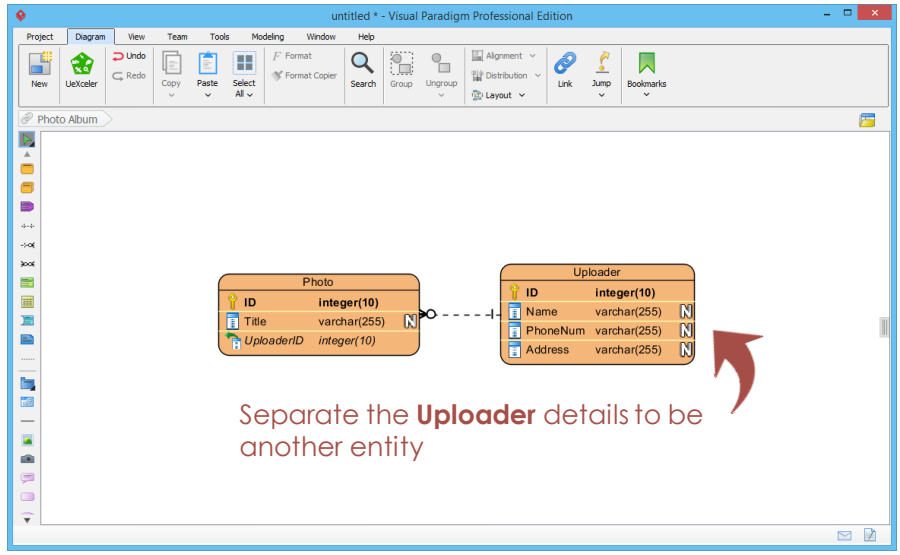
Database Design Notations



Records of **Photo** table

Introduction

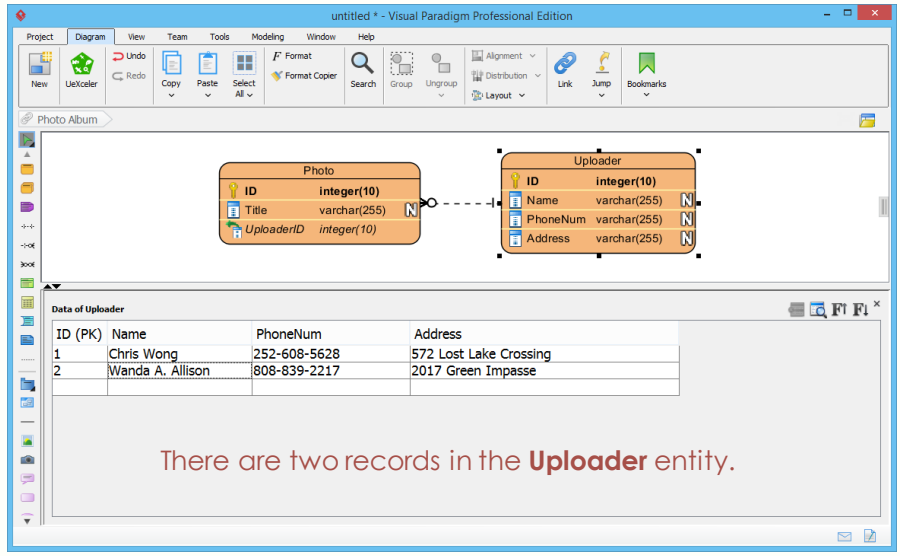
Database Design Notations



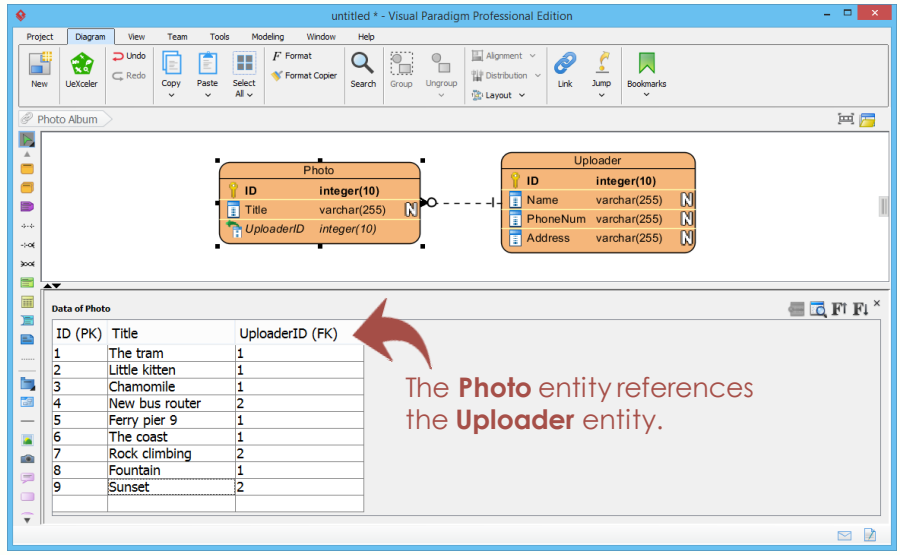
Separate the **Uploader** details to be another entity

Introduction

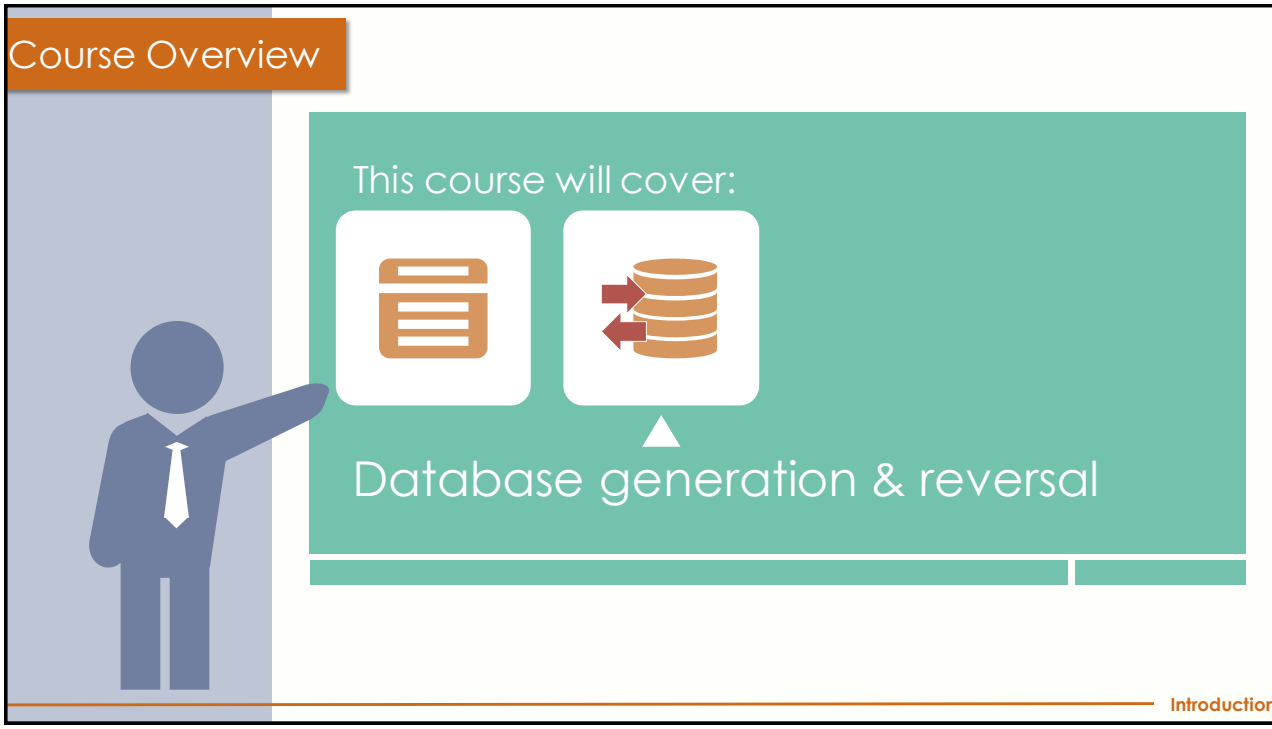
Database Design Notations

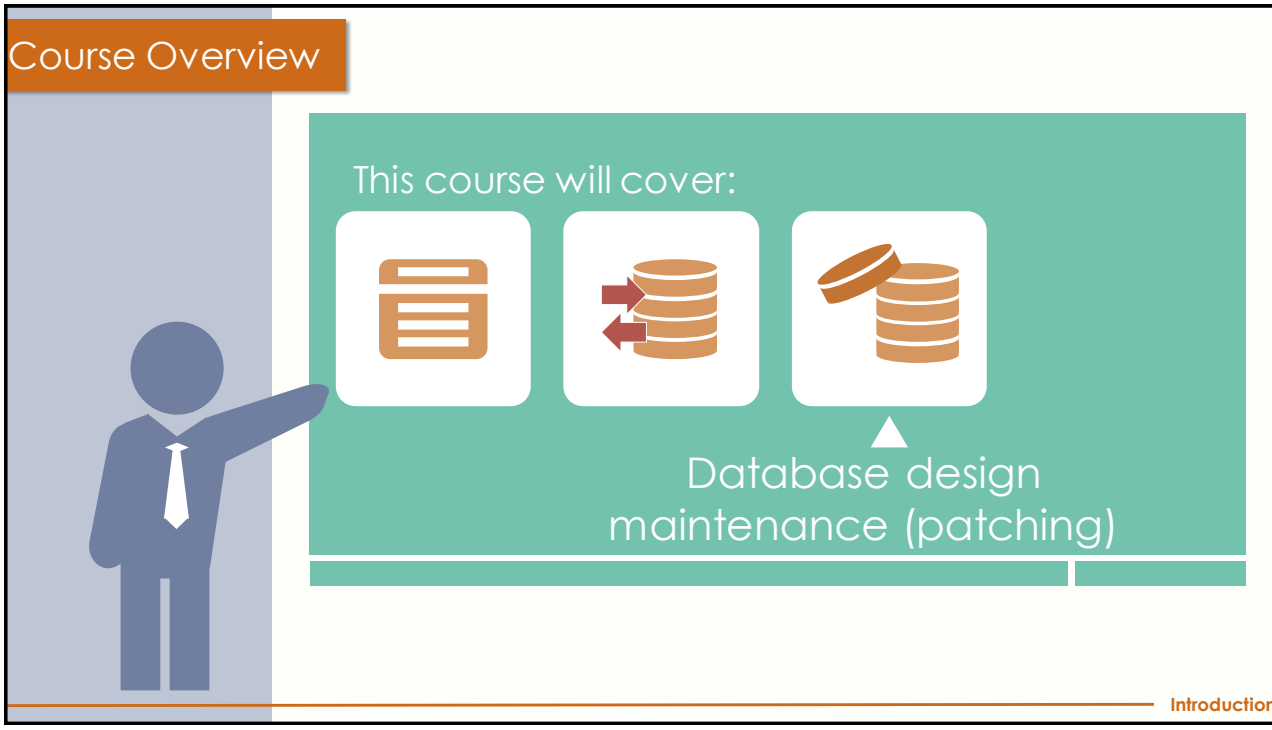


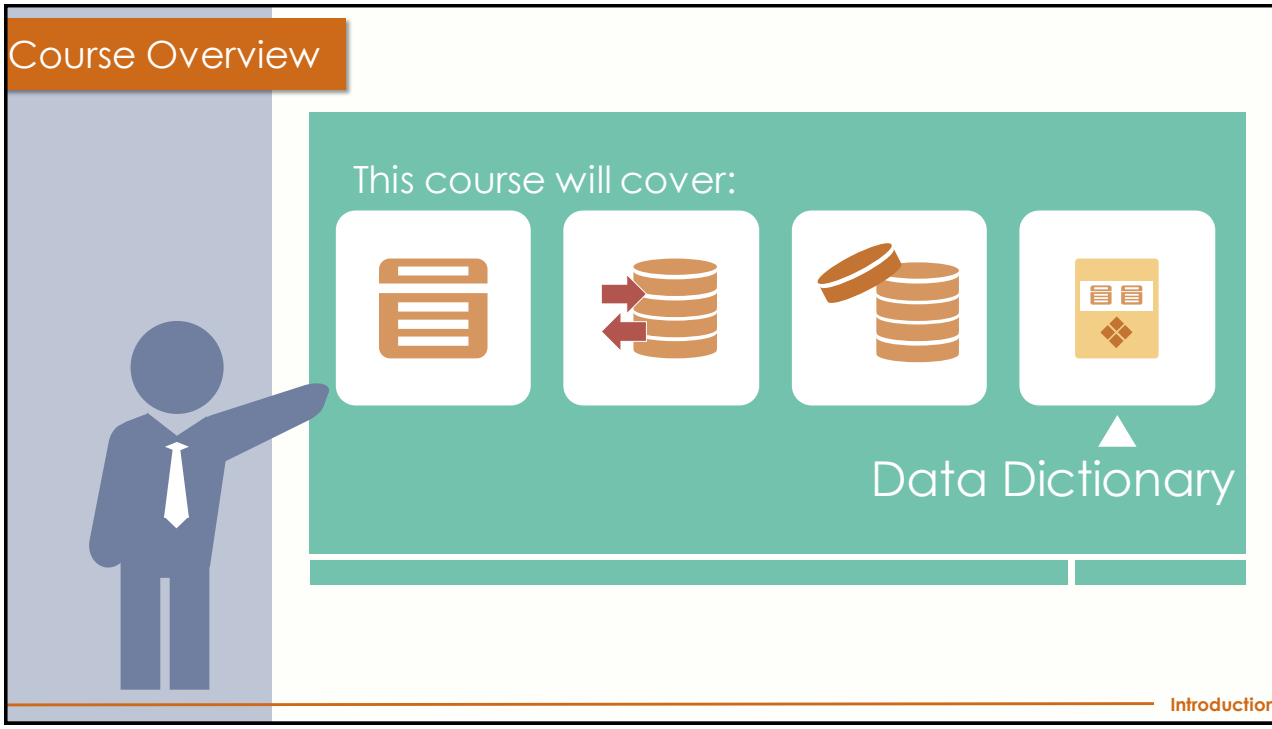
Database Design Notations



Course Overview
This course will cover:
Database design
Introduction


Course Overview
This course will cover:
Database generation & reversal
Introduction


Course Overview
This course will cover:
Database design
maintenance (patching)
Introduction


Course Overview
This course will cover:
Data Dictionary
Introduction

Course Overview

Not covered:

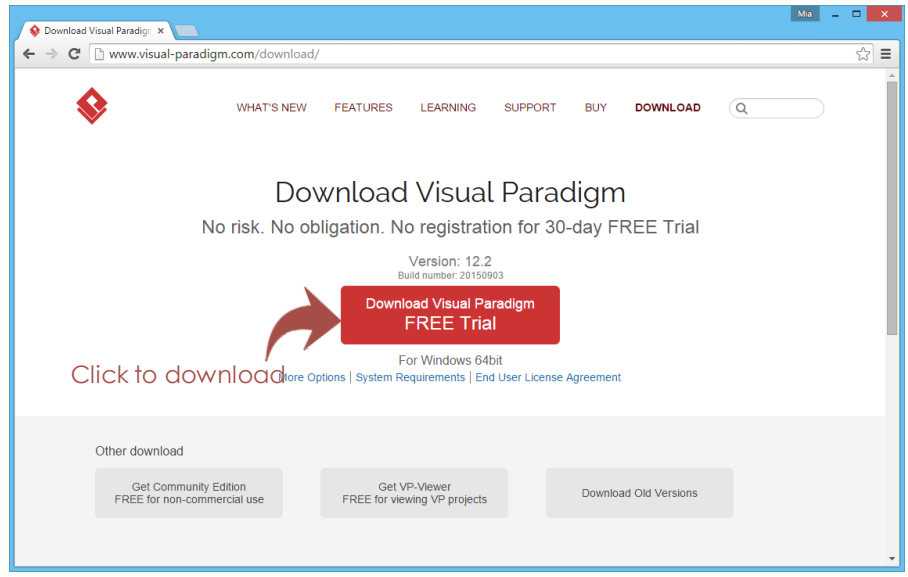
- How to discover database tables
- Normalization
- Query database (SQL)

Required Software

Visual Paradigm

Standard Edition

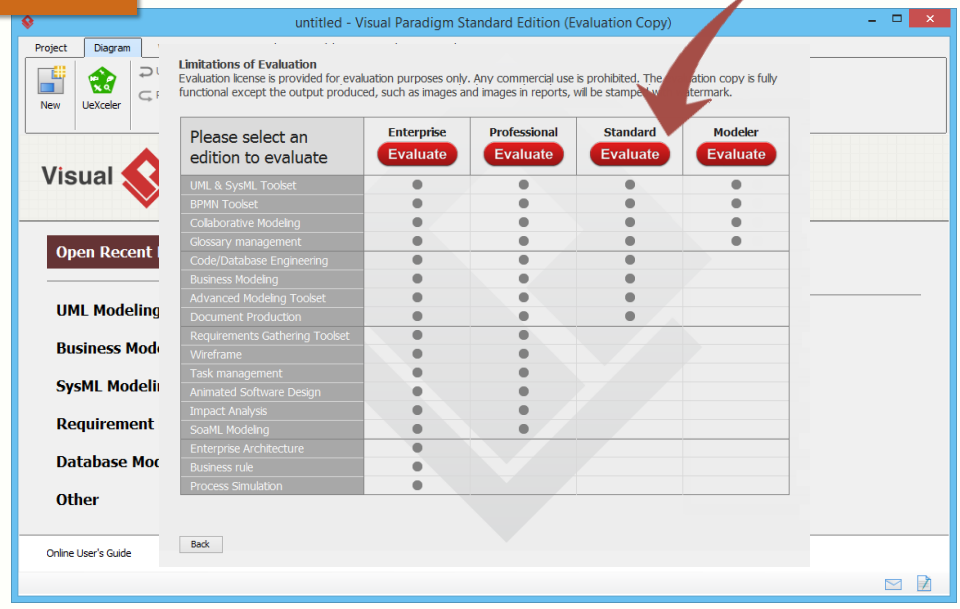
Required Software



Introduction

Required Software

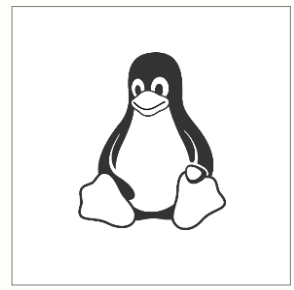
Evaluate **Standard** Edition



Introduction

Required Software

Supported operating systems:



▲

This training is based on **Windows**, but also applies to **Linux** and **Mac** users.

Required Software

Database Management System:

ORACLE

MySQL

SQL Server