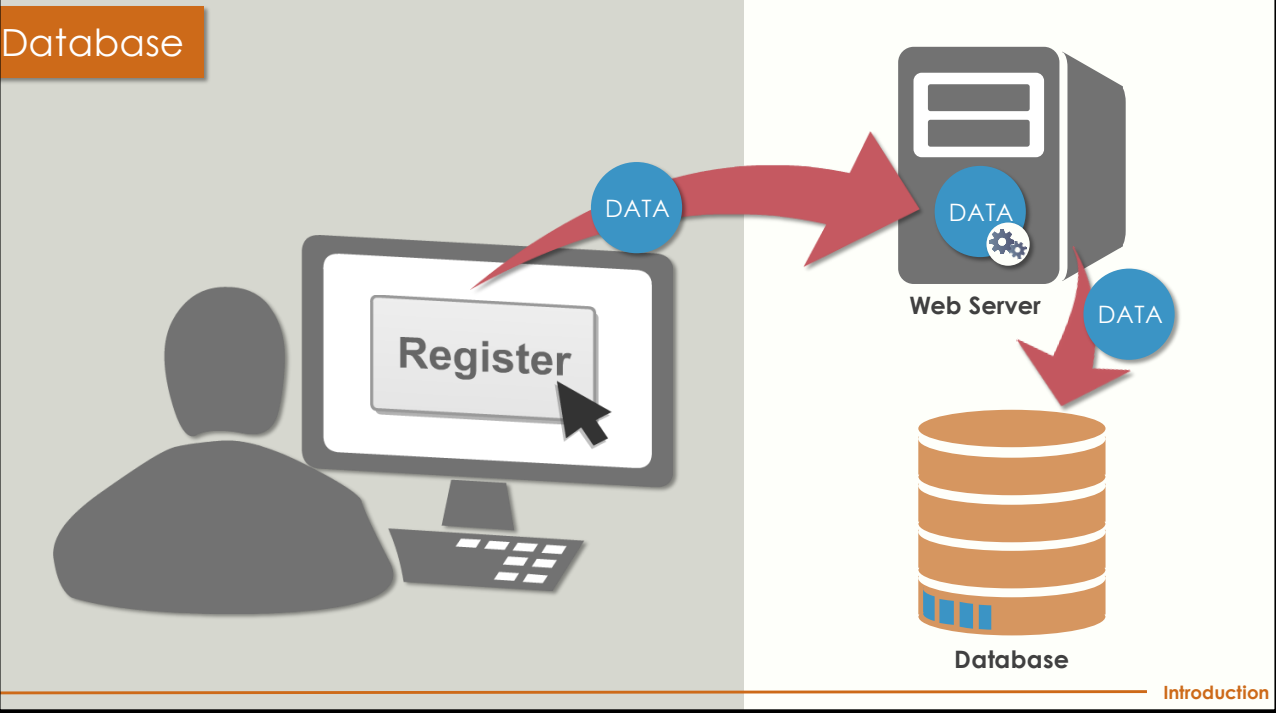


Introduction

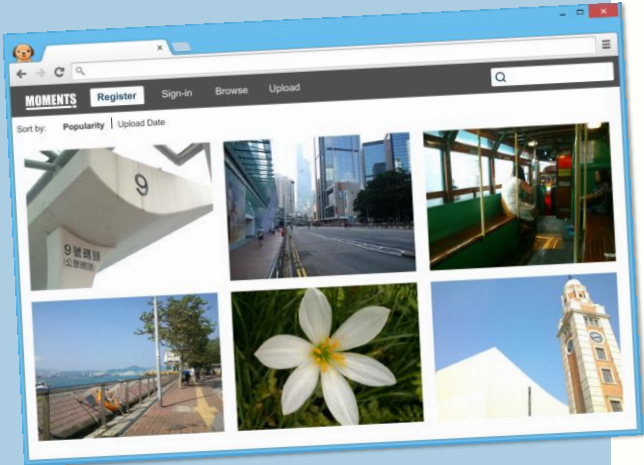


Database



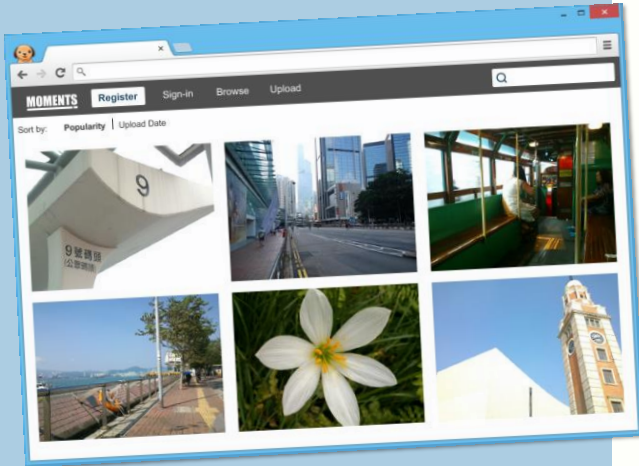
Database stores
long-term persistent data

Database



Example:
MOMENTS online
photo album

Database



Persistent data:

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

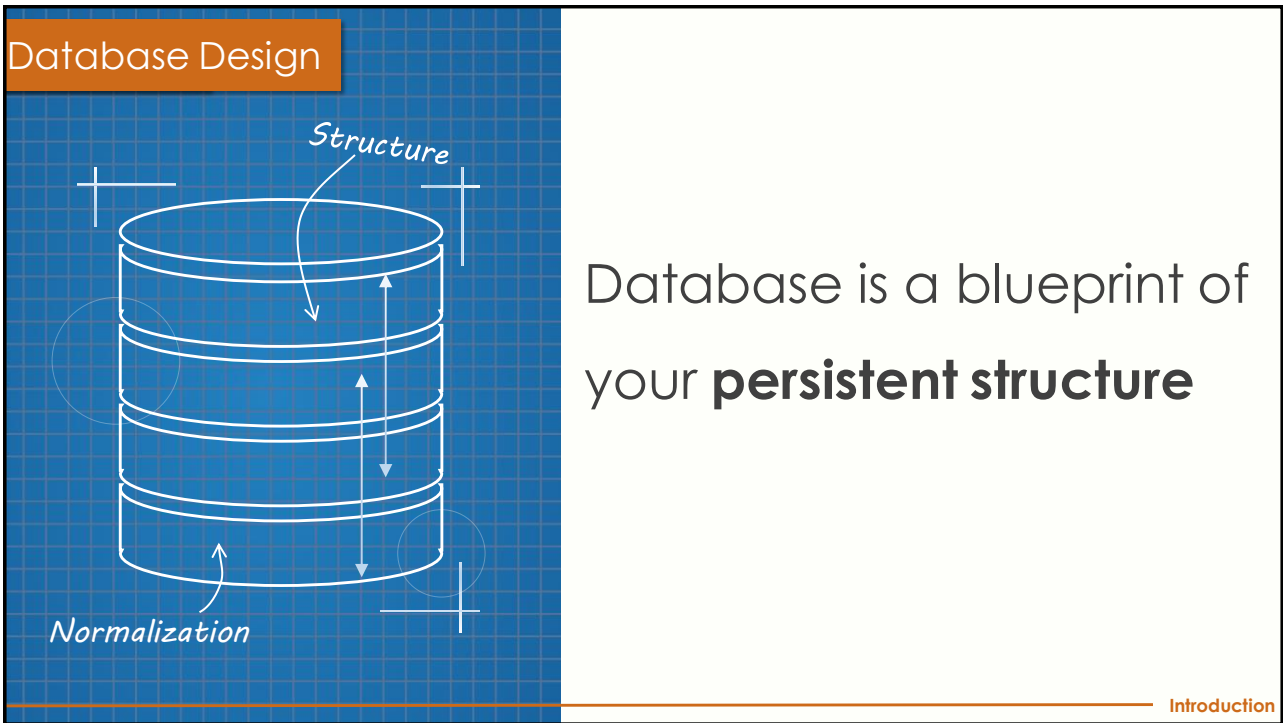
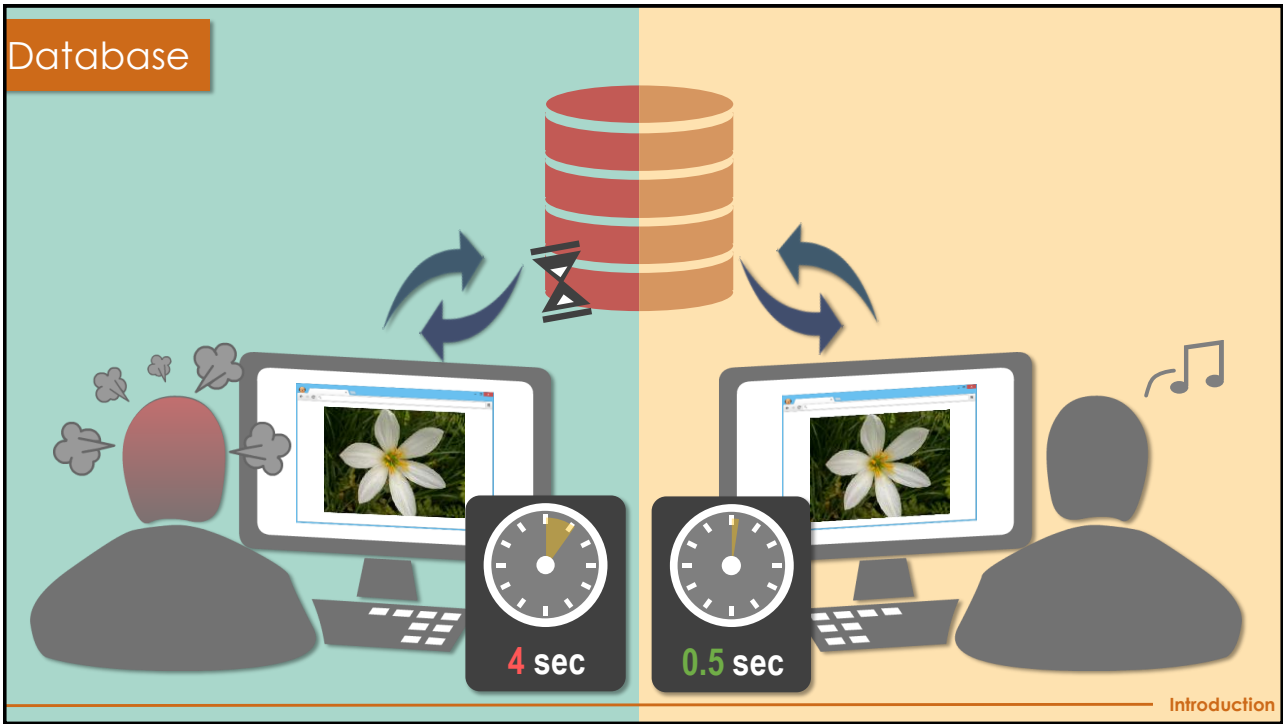
Introduction

Database



Database performance
influences
software performance

Introduction



Database Design - Why



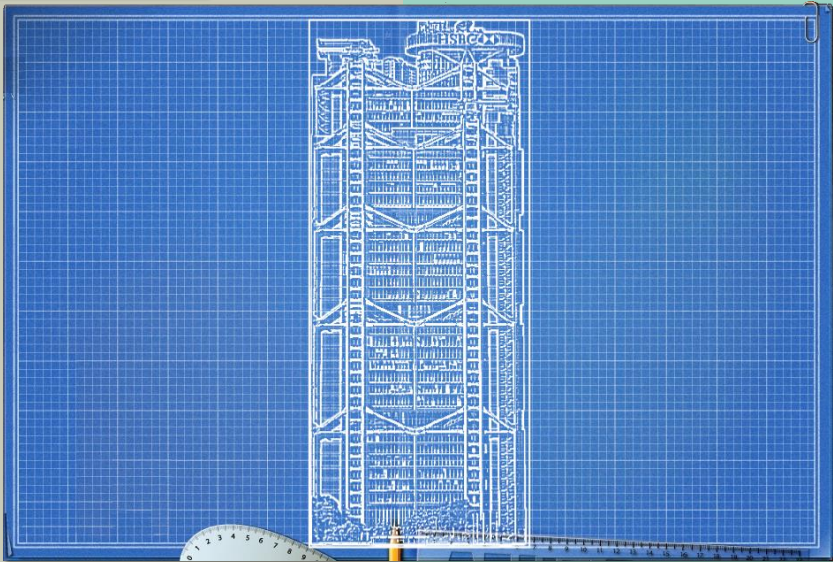
Introduction

Database Design - Why



Introduction

Database Design - Why



Introduction

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...
```



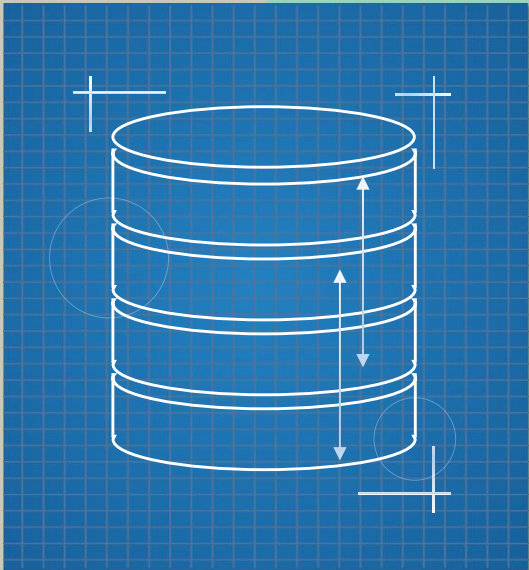
Introduction

Database Design - Why



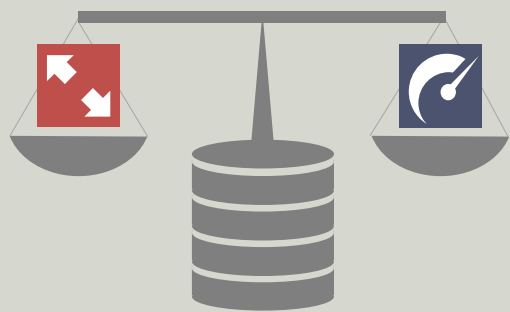
Introduction

Database Design - Why



Introduction

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**



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
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**



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**

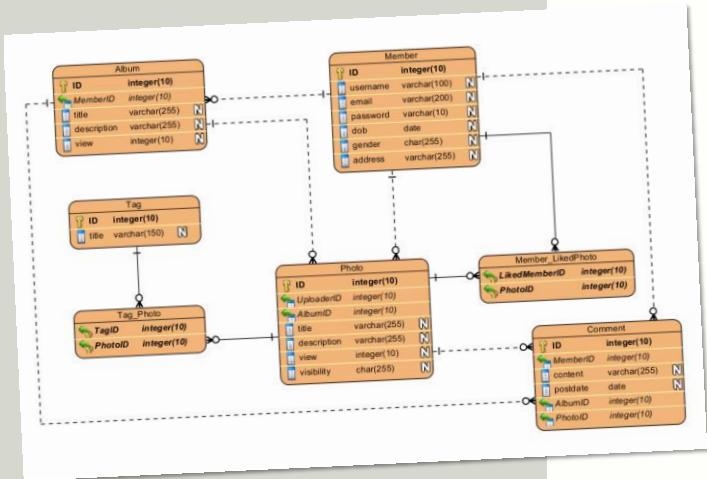


Photo and Uploader details in **separate tables**



Introduction

Database Design Notations

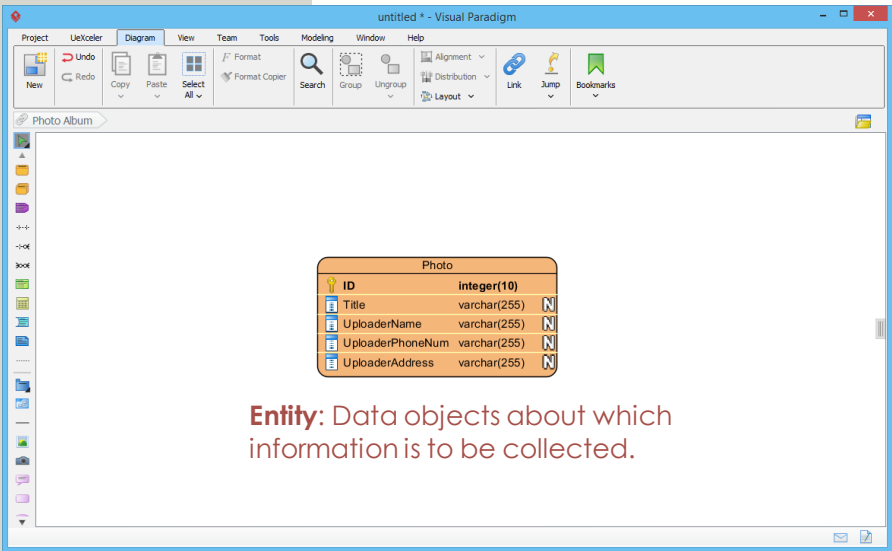


Entity Relationship Diagram (ERD)

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

ID (PK)	Title	UploaderName	UploaderPhoneNum	UploaderAddress
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	Fetty 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	Subset	Wanda A. Allison	808-839-2217	2017 Green Impasse

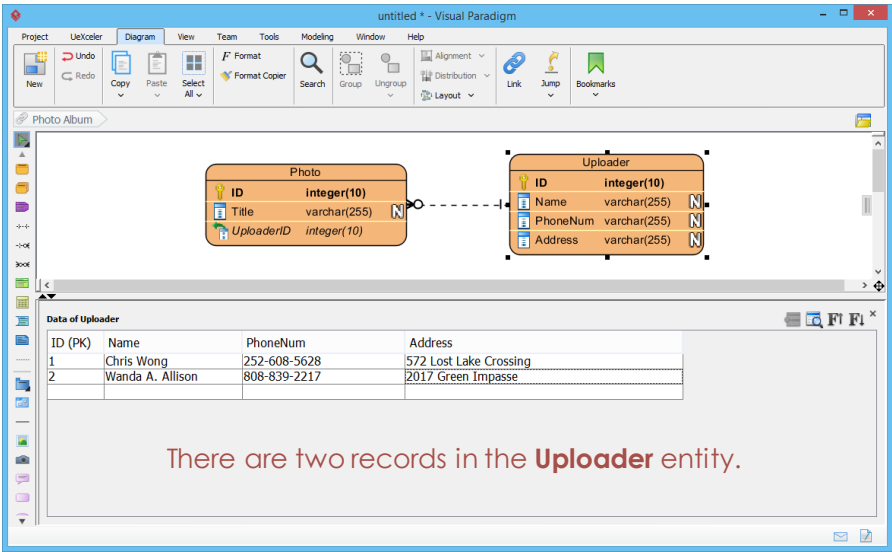
Introduction

Database Design Notations

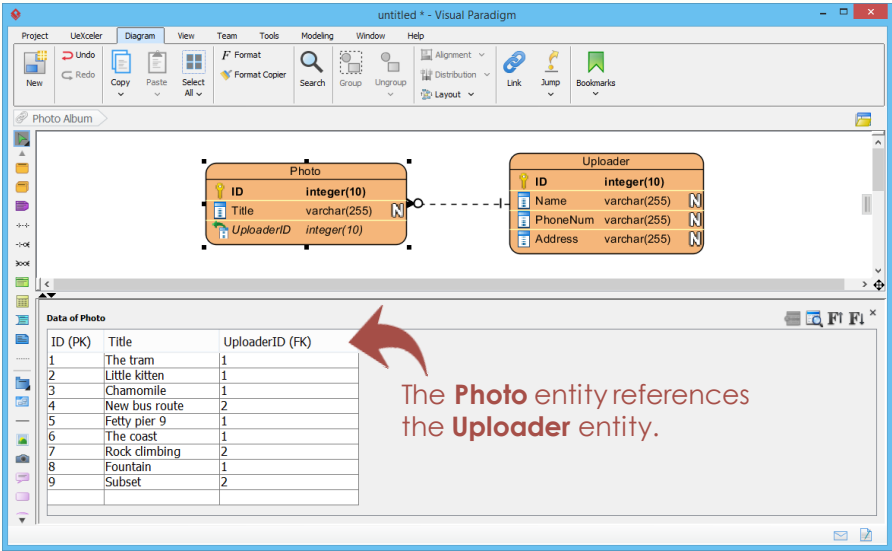
Separate the **Uploader** details to be another entity

Introduction

Database Design Notations



Database Design Notations



Course Overview

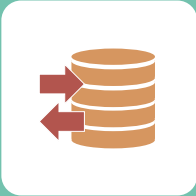
This course will cover:



Database design

Course Overview

This course will cover:

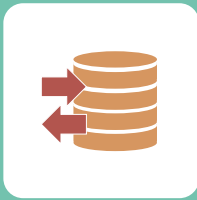


Database generation & reversal

Course Overview



This course will cover:

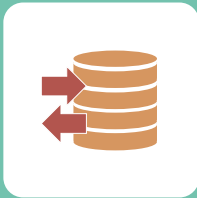


Database design
maintenance (patching)

Course Overview



This course will cover:



Data Dictionary

Course Overview

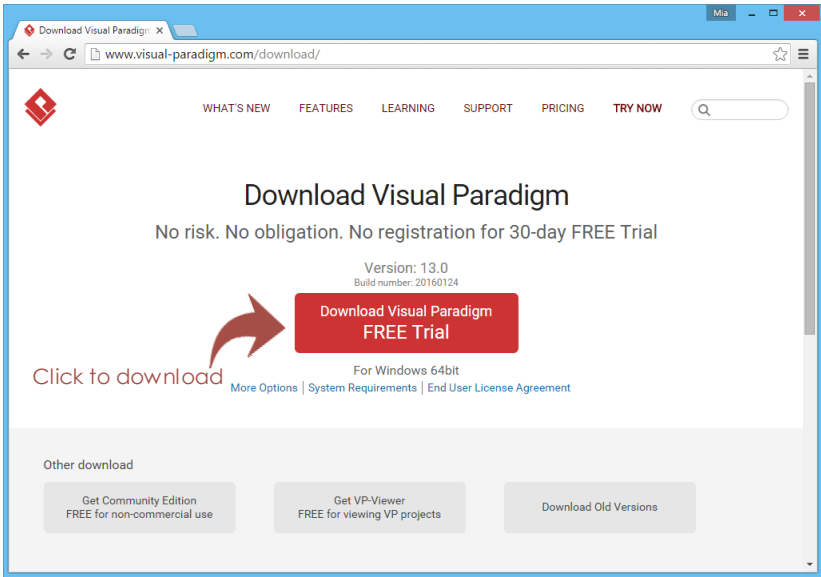


- Not covered:
- How to discover database tables
 - Normalization
 - Query database (SQL)

Required Software

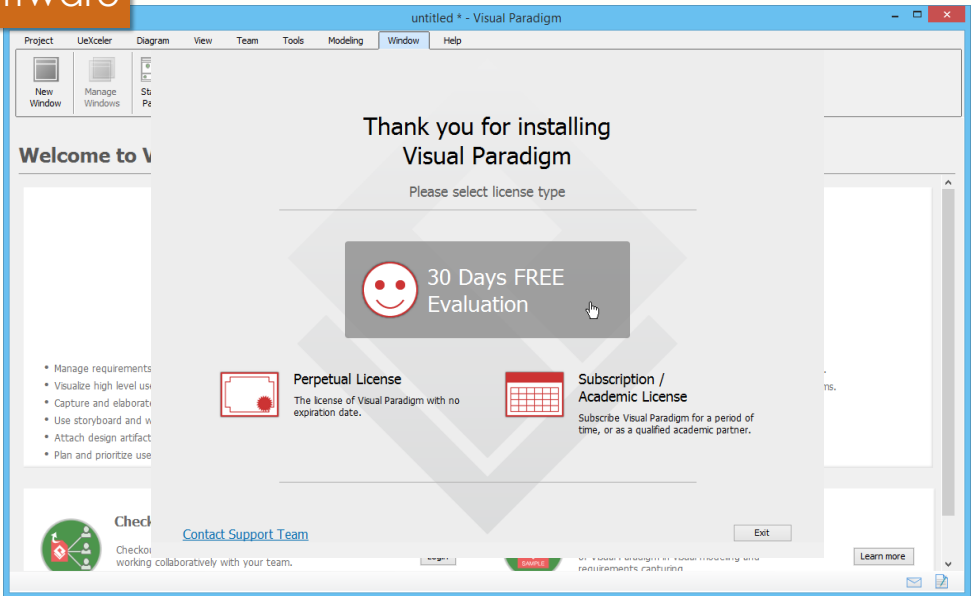


Required Software



Introduction

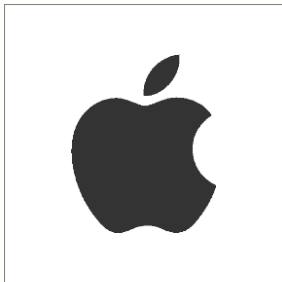
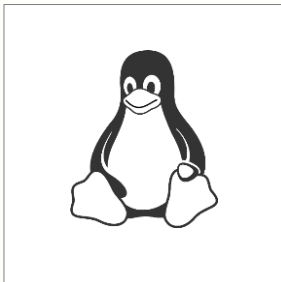
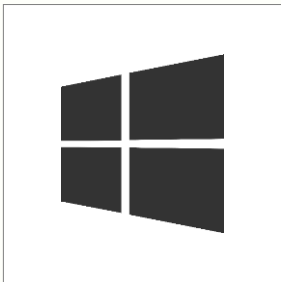
Required Software



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:

