LW-02. Creation Relation Data Model with Online CASE Tools.

1. Lab Target.

Learn how to create data dictionary, logical relational data model and study the relevant Online CASE Tools.

2. Lab Assignment.

2.0. Select Your Individual Variant of the Assignment.

2.1. Register on DbDesigner.net Site.

2.2. Training work with DbDesigner.net.

2.3. Fill in Initial Data Dictionary. Select name for your DB.

2.4. Create Initial RDM Scheme.

2.5. Create Share Link to Initial RDM Scheme.

2.6. Export Initial RDM Scheme to sql-code(create.sql) and make manually corrections (if need)..

3. Lab Report.

The report is provided electronic form with Report Blank Form. The report includes:

3.0. Individual variant of the assignment formation from student name.

3.1. Filled Initial Data Dictionary Table.

3.2. Initial RDM Scheme Image include: DB Name, Author Name, Creation Date and Relationship obligation/cardinality description.

3.3. Initial RDM Scheme Share Link.

3.4. Code of the "Create.sql".

Grade.

Grade on 10 points: correctly formed individual task variant and correctly made of all assignments.

4. LAB GUIDELINES

4.0. SELECT YOUR INDIVIDUAL VARIANT NR.

a) Write your LastName in English alphabet. Must be at least 4 letters, if not enough, then add the required number of letters from the FirstName (if not enough, then repeat LastName and FirstName).

For example, for student name Yuriy Li there will be LIYU.

b) Replace the first 4 letters with their ordinal numbers in the alphabet, writing the numbers as two-digit decimal numbers.

For example, 12 09 25 21.

c) Consistently add modulo 10 these 4 numbers and add 1

For example, (12 + 09 + 25 + 21)mod10 + 1 = 67mod10 + 1 = 7 +1 = 8.
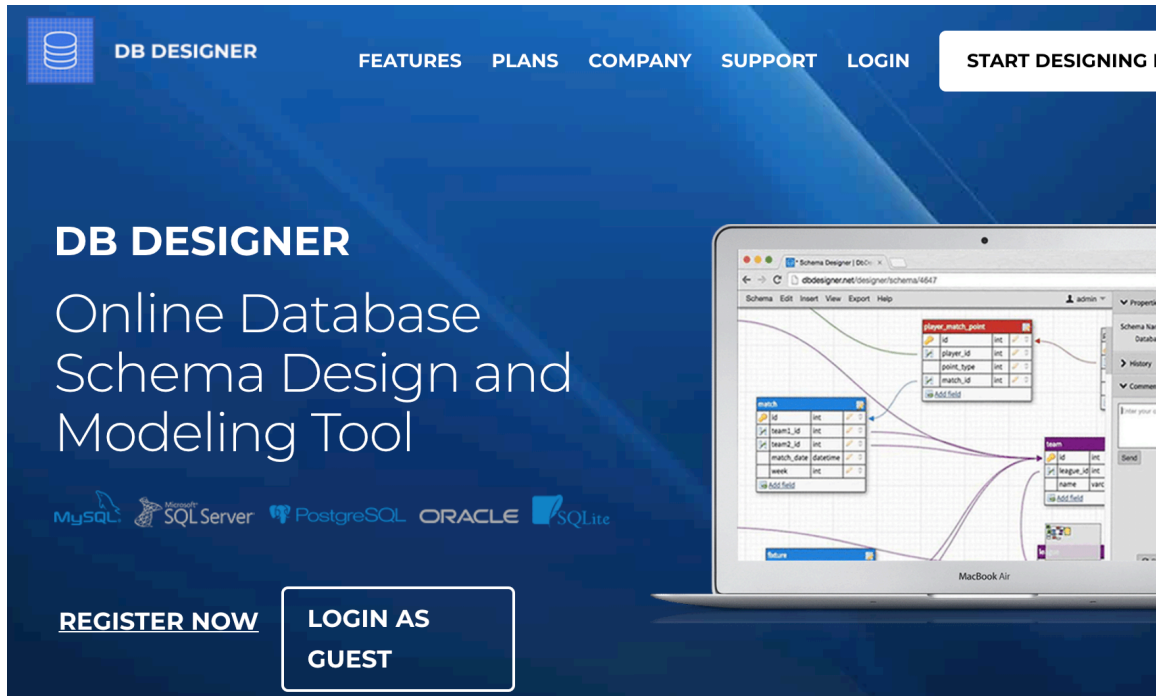
d) The resulting will be your variant Nr.

The number 8 in the example has been replaced by 0.

Aa	Bb	Cc	Dd	Ee	Ff	Gg
1	2	3	4	5	6	7
Hh	Ii	Jj	Kk	Ll	Mm	Nn
8	9	10	11	12	13	14
Oo	Pp	Qq	Rr	Ss	Tt	Uu
15	16	17	18	19	20	21
Vv	Ww	Xx	Yy	Zz		
22	23	24	25	26		

See assignment variant bellow in this document.

4.1. REGISTER ON DBDESIGNER.NET SITE

4.1.1. Go to in https://www.dbdesigner.net/ and select Register Now

DBDESIGNER LIMITATIONS FOR FREE ACCOUNT!

MAX 2 DB WITH 10 TABLE EVERY.

4.1.3. Get Tutorial (Help → Show Tutorial)

4.1.2. Fill in fields: Name, Email, Password.

DbDesigner Interface.

4.2.1. Select File →New Schema → Title →MySQL →Create New Schema

4.2.2. Select Settings → Set Recommended Settings … (**look on right**)

4.2.3.a. Select File → Save As… → Name
4.2.3.b. Select File → Save, if repeat saving

4.2.4. Select Profile → Dashboard → for View/Clone/Delete Project

4.3. FILL IN INITIAL DATA DICTIONARY.

4.3.1. After analyses your Subject Area select **Name** for your RDM

4.3.2. And fill in yellow table cells: Attribute Name, PK/FK, Type, Size, Auto Incr., Null, Unique, Default, Range.

4.3.3. If need, then insert additional Attributes to your Entitys. For example, "Course Nr" to "Teachers" for relationship creation between Teachers and Courses; or "Course Name" to "Courses" for course name defining.

Add Initial Data Dictionary Table to Report. Only **part of the table** is shown! (see full example in Report Blank Form)

Var. Nr	Entity	Attribute Description	Attribute Name	PK, FK	Type	Size	Auto Incr.	Null	Unique	Default	Range
0	Teachers	Teacher Nr	teacher_id	PK	tinyint		Yes		Yes		<120
		Teacher Name Surname	teacher_name		varchar	20					
		Teacher Phone	teacher_phone		int			Yes			8 dig
		Course Nr	course_id	FK	smallint						
	Students	Student Nr	student_id	PK	smallint		Yes		Yes		<10000
		Name Surname	student_name		varchar	20					
		Birthday	student_birthday		date			Yes		Null	
		Address	student_address		varchar	40		Yes		Null	
		Phone	student_phone		int			Yes		Null	8 dig
		Passport	student_passport		char	15		Yes	Yes	Null	
		Language	language		enum					English	Eng,Rus,Lat
		Group Nr	group_id	FK	tinyint						
	Contracts	Contract Id	contract_id	PK	smallint		Yes		Yes		<10000
		Number	contract_number		char	20			Yes		
		Date	contract_date		date						
		Student Nr	student_id	FK	smallint				Yes		
	Courses	Course Nr	course_id	PK	smallint		Yes		Yes		<1000
		Course Name	course_name		varchar	50			Yes		
		Duration	course_duration		tinyint						

4.4. CREATE INITIAL RDM SCHEME.

(see example in Report Blank Form).

4.4.1. Build an initial set of **Relations** from database scheme. Example for MySchool: Teachers, Students, Contracts, Courses, Groups tables.

4.4.2. Identify the **Relationship** between the relations and add new fields if need.

4.4.3. Determine the **Obligation** (optional, mandatory) and **Cardinality** (min, max) of the relationship, add Notes to RDM in engineering notation (0,1:1,m).

       c) Identify the PK and FK and add missing binding relations, keys attributes and restrictions to Initial Data Dictionary (p.4.3).

4.5. EXPORT/SHARE INITIAL RDM SCHEME.

4.5.1. Export RDM to image.

       Copy picture from your browser or Select menu Export → Export Image…

       Add RDM Scheme Image to Report. (see example in Report Blank Form)

4.5.2. Share RDM by link.

       Copy link from your browser header string or Select menu Share → Get Short Link…

       Add RDM Scheme Share Link to Report. (see example in Report Blank Form)

4.5.3. Export RDM to sql-file.

Select menu Export → Export SQL… → Create to MySQL → Export → Open Downloads in New Tab.

Add RDM Scheme Create.sql code to Report. (see example in Report Blank Form)

Export SQL

Please select a database type.

Database: **Mysql** ▾

Please select a script type.

Default · **Create** · Alter · Drop

EXPORT

SQL Ready!

Please visit the Download Section of your account Dashboard to download.

OPEN DOWNLOADS IN NEW TAB · LATER
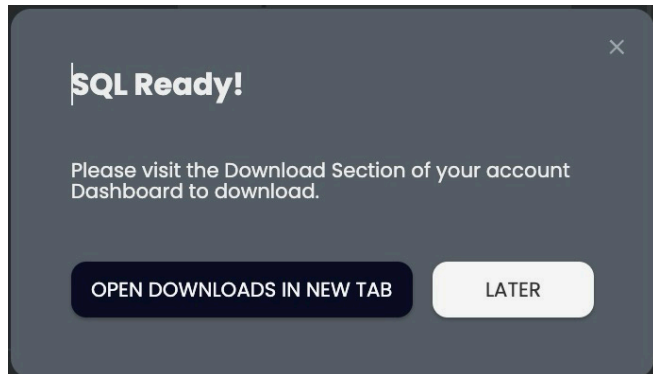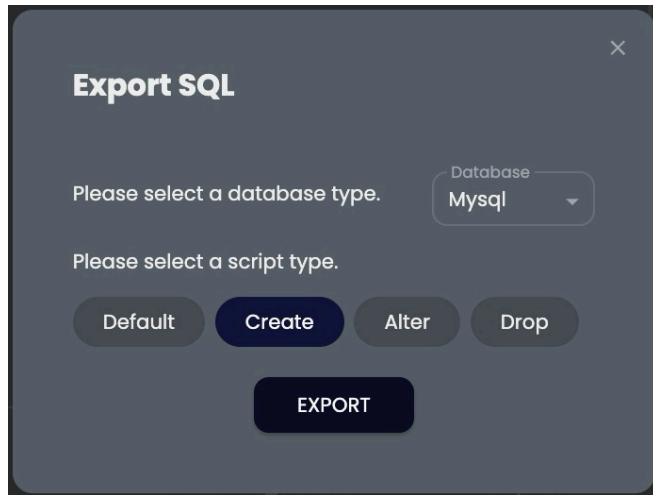
📄 My_School_1_(mysql)-1738878627.sql

```sql
CREATE TABLE IF NOT EXISTS `Teachers` (
        `teacher_id` tinyint AUTO_INCREMENT NOT NULL UNIQUE,
        `teacher_name` varchar(20) NOT NULL,
        `teacher_phone` int,
        `course_id` smallint NOT NULL,
        PRIMARY KEY (`teacher_id`)
);

CREATE TABLE IF NOT EXISTS `Courses` (
        `course_id` smallint AUTO_INCREMENT NOT NULL,
        `course_name` varchar(50) NOT NULL UNIQUE,
        `course_duration` tinyint NOT NULL,
        `course_cost` decimal(6,2),
        PRIMARY KEY (`course_id`)
);

CREATE TABLE IF NOT EXISTS `Groups` (
        `group_id` tinyint AUTO_INCREMENT NOT NULL UNIQUE,
        `group_name` varchar(8) NOT NULL UNIQUE,
        `group_start` date,
        `group_finish` date,
        `course_id` smallint NOT NULL,
        PRIMARY KEY (`group_id`)
);

CREATE TABLE IF NOT EXISTS `Students` (
        `student_id` smallint AUTO_INCREMENT NOT NULL UNIQUE,
        `student_name` varchar(20) NOT NULL,
        `student_birthday` date,
        `student_adress` varchar(40),
        `student_phone` int,
        `student_passport` char(15) UNIQUE,
        `language` enum NOT NULL DEFAULT 'Latvian',
        `group_id` tinyint NOT NULL,
        PRIMARY KEY (`student_id`)
);

CREATE TABLE IF NOT EXISTS `Contracts` (
        `contract_id` smallint AUTO_INCREMENT NOT NULL UNIQUE,
        `contract_number` char(20) NOT NULL UNIQUE,
        `contract_date` date NOT NULL,
        `student_id` smallint NOT NULL UNIQUE,
        PRIMARY KEY (`contract_id`)
);

ALTER TABLE `Teachers` ADD CONSTRAINT `Teachers_fk3` FOREIGN KEY (`course_id`) REFERENCES `Courses`(`course_id`);

ALTER TABLE `Groups` ADD CONSTRAINT `Groups_fk4` FOREIGN KEY (`course_id`) REFERENCES `Courses`(`course_id`);
ALTER TABLE `Students` ADD CONSTRAINT `Students_fk7` FOREIGN KEY (`group_id`) REFERENCES `Groups`(`group_id`);
ALTER TABLE `Contracts` ADD CONSTRAINT `Contracts_fk3` FOREIGN KEY (`student_id`) REFERENCES `Students`(`student_id`);
```

ВАРИАНТЫ ЗАДАНИЙ

Var. Nr	Entity	Attribute Description	Attribute Name	PK, FK	Type	Size	Auto Incr.	Null	Unique	Default	Range
0	Teachers	Teacher Nr									
		Teacher Name Surname									
		Teacher Phone									
	Students	Student Nr									
		Name Surname									
		Birthday									
		Address									
		Phone									
		Passport									
		Language									
		Group Nr									
	Contracts	Contract Id									
		Number									
		Date									
		Student Nr									
	Courses	Course Nr									
		Duration									
		Cost Sum									
	Groups	Group Nr									
		Start Date									
		Finish Date									
		Course Nr									

Var. Nr	Entity	Attribute Description	Attribute Name	PK, FK	Type	Size	Auto Incr.	Null	Unique	Default	Range
1	Teachers	Tabell Number									
		Surname of the teacher									
		Name of teacher									
		Teacher position									
		Work experience (years)									
		Department ID									
	Departments	Department ID									
		Department Name									
		Abbreviation									
		Number of work pozitions									
	Lessons	Day of spending									
		Time spending									
		Type									
		Course Id									
	Auditory	Corpus									
		Floor									
		Room Number									
		Auditory type									
		Capacity									
	Groups	Group number									
		Faculty									
		Number of students									
	Training Courses	Course Id									
		Course Name									
		Number of hours									

Var. Nr	Entity	Attribute Description	Attribute Name	PK, FK	Type	Size	Auto Incr.	Null	Unique	Default	Range
2	Faculties	Faculty identifier									
		Full name									
		Dean									
	Groups	Group number									
		Leader ID									
		Number of students									
		Graduating department									
	Students	Student ID Number									
		Surname									
		First name									
		Date of birth									
		Group									
		Gender									
		Region									
		Dormitory accommodation									
	Academic Performances	Course identifier									
		Student ID Number									
		Semester number									
		Date									
		Rating									
	Semesters	Semester number									
		Start									
		Ending									
		Number of weeks									
	Courses	Course ID									
		Course Name									
		Number of hours									

Var. Nr	Entity	Attribute Description	Attribute Name	PK, FK	Type	Size	Auto Incr.	Null	Unique	Default	Range
3	Competitions	Competition identifier									
		Sport identifier									
		Start date									
		End date									
		Stadium identifier									
	Stadiums	Stadium identifier									
		Title									
		Address									
		Capacity									
	Teams	Team identifier									
		Team name									
		City									
		Number of players									
		Trainer									
	Athletes	Athlete Number									
		Surname									
		Name									
		Middle name									
		Team identifier									
	Results	Athlete Number									
		Date of execution									
		Attempt Number									
		Attempt Result									
	Sports	Sport identifier									
		Sport Name									

Var. Nr	Entity	Attribute Description	Attribute Name	PK, FK	Type	Size	Auto Incr.	Null	Unique	Default	Range
4	Students	Student Identifier Number									
		Surname									
		Name									
		Group Number									
		Date of Birth									
		Gender									
		Address									
	Relative Types	Type of Relative identifier									
		Name of Relative									
	Student Relatives	Relative identifier									
		Type of Relative identifier									
		Surname									
		Name									
		Address									
		Date of Birth									
	Discounts	Student Identifier Number									
		Type of Discount									
		Base (document)									
		Date of Issue									
	Groups	Group Number									
		Faculty Identifier									
		Number of students									
	Faculties	Faculty Identifier									
		Faculty Name									
		Dean									
		Dean Phone									

Var. Nr	Entity	Attribute Description	Attribute Name	PK, FK	Type	Size	Auto Incr.	Null	Unique	Default	Range
5	Medical Institutions	Medical Institution Number									
		Type of Medical Institution									
		Specialization of a Medical Institution									
		Address									
	Doctors	Doctor's personnel number									
		Medical Institution Number									
		Surname									
		Name									
		Specialty									
	Patients	Insurance Policy Number									
		Surname									
		Name									
		Date of Birth									
		Address									
	Visits	Date of visit									
		Visit time									
		Cabinet number									
		Doctor's personnel number									
		Insurance Policy Number									
		Diagnosis id									
		Procedure Number									
	Procedures	Procedure Number									
		Procedure Name									
		Duration									
		Price									
	Diagnoses	Diagnosis id									
		Diagnosis Description									

Var. Nr	Entity	Attribute Description	Attribute Name	PK, FK	Type	Size	Auto Incr.	Null	Unique	Default	Range
6	Stores	Store Number									
		Store Name									
		Specialization									
		Address									
		Personnel Number of Director									
	Sectors	Sector Number									
		Sector Name									
		Store Number									
		Personnel Number of Manager									
	Employees	Personnel number of Employee									
		Surname, First Name									
		Address									
		Gender									
		Date of Birth									
	Products	Product ID									
		Sector Number									
		Price									
		Quantity									
		Expiration Date									
		Date of Delivery									
		Supplier Number									
	Contracts	Contract Number									
		Date									
		Supplier Number									
	Suppliers	Supplier Number									
		Supplier Name									
		Supplier Address									

Var. Nr	Entity	Attribute Description	Attribute Name	PK, FK	Type	Size	Auto Incr.	Null	Unique	Default	Range
7	Libraries	Library Number									
		Library Name									
		Address									
	Depositories	Depository Number									
		Floor									
		Capacity									
	Employees	Personnel number of Employee									
		Surname, First Name									
		Date of Birth									
		Position									
	Books	Book Number									
		Book Code									
		Author									
		Title									
		Publishing House									
		Publishing Year									
		Price									
		Coming Date									
		Depository Number									
	Subscribers	Number of Ticket									
		Surname, First Name									
		Address									
		Phone									
	Issues	Number of Ticket									
		Book Number									
		Issue Date									
		Return Date									

Var. Nr	Entity	Attribute Description	Attribute Name	PK, FK	Type	Size	Auto Incr.	Null	Unique	Default	Range
8	Factorys	Factory Number									
		Name									
		Address									
		Director Surname Name									
	Divisions	Division Number									
		Factory Number									
		Chief Surname Name									
	Products	Product Code									
		Factory Number									
		Division Number									
		Product Name									
		Product Weight									
		Manufacturing Technology Code									
	Manufacturing Technologys	Manufacturing Technology Code									
		Description									
		Developer									
		Duration									
	Details	Detail Code									
		Detail Name									
		Product Code									
		Weight									
		Dimensions									
		Supplier Code									
	Suppliers	Supplier Code									
		Supplier Name									
		Address									
		Director Surname Name									

Var. Nr	Entity	Attribute Description	Attribute Name	PK, FK	Type	Size	Auto Incr.	Null	Unique	Default	Range
9	Bus Stations	Bus Station Number									
		City									
		Phone									
	Bus Stops	Bus Stop name									
		Coordinates									
		Trip Number									
		Serial Number									
	Buses	Bus Number									
		Bus Station Number									
		Seats quantity									
		Exploitation Start Date									
	Drivers	Driver Personnel Number									
		Surname, First Name									
		Date of Birth									
		Passport data									
		License									
		Experience Start Date									
	Trips	Trip Number									
		Bus Station Number									
		Destination									
		Departure time									
		Arrival time									
		Driver Personnel Number									
		Bus Number									
	Tickets	Ticket Number									
		Trip Number									
		Date									

Var. Nr	Entity	Attribute Description	Attribute Name	PK, FK	Type	Size	Auto Incr.	Null	Unique	Default	Range
10	Sellers	Seller Code									
		Seller Name									
		Address									
		Phone									
	Buyers	Buyer Code									
		Buyer Name									
		Address									
		Phone									
	Products	Product Code									
		Product Name									
		Weight									
		Dimensions									
		Warehouse Number									
	Sales	Invoice Number									
		Product Code									
		Seller Code									
		Buyer Code									
		Delivery Code									
		Price									
		Quantity									
		Sale Date									
	Deliveries	Delivery Code									
		Delivery Destination									
		Delivery Date									
		Progress mark									
	Warehouses	Warehouse Number									
		Address									