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# Database Design and Modelling using Lucidchart

Hans-Petter Halvorsen



# Lucidchart

- Lucidchart is an online multipurpose diagram tool.
- It can also be used to create Database diagrams.
- You can use it for free, but it also have paid options for more functionality and features.
- You can share and collaborate with others.
- It has a built in ERD template that you can use.
- Homepage: <https://www.lucidchart.com>
- Create an Entity Relationship Diagram in Lucidchart: <https://help.lucid.co/hc/en-us/articles/16471565238292-Create-an-Entity-Relationship-Diagram-in-Lucidchart>

ERD – Entity  
Relationship  
Diagram

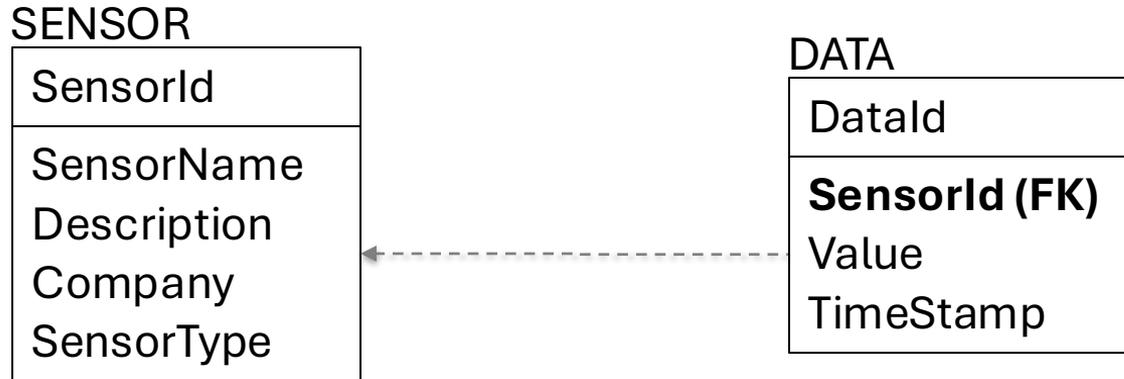
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# Design Fundamentals

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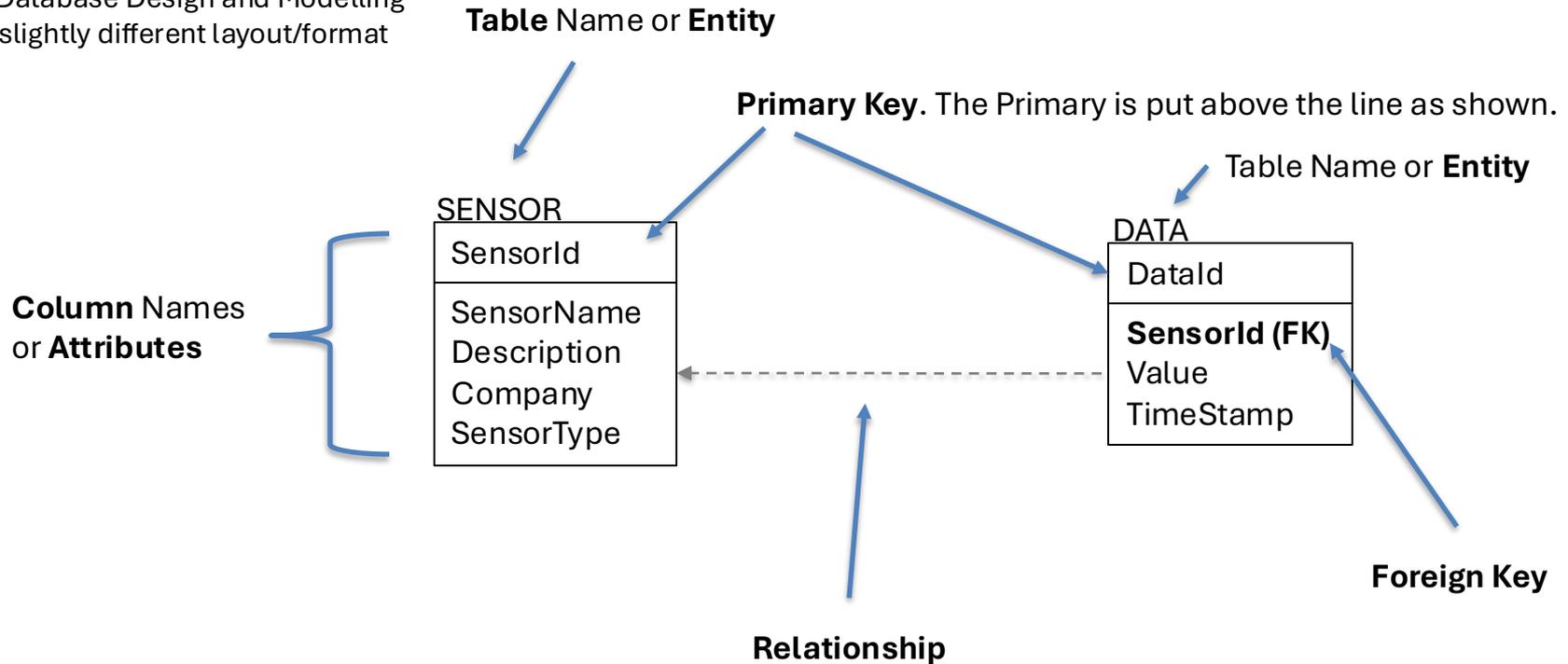
# Basic Example



An **Entity Relationship** diagram (ERD or just ER diagram) is a visual representation of a database that shows how the elements within are related. An ER diagram is made up of two object types, **entities** and **relationships**.

# ERD Fundamentals

Each Database Design and Modelling has a slightly different layout/format

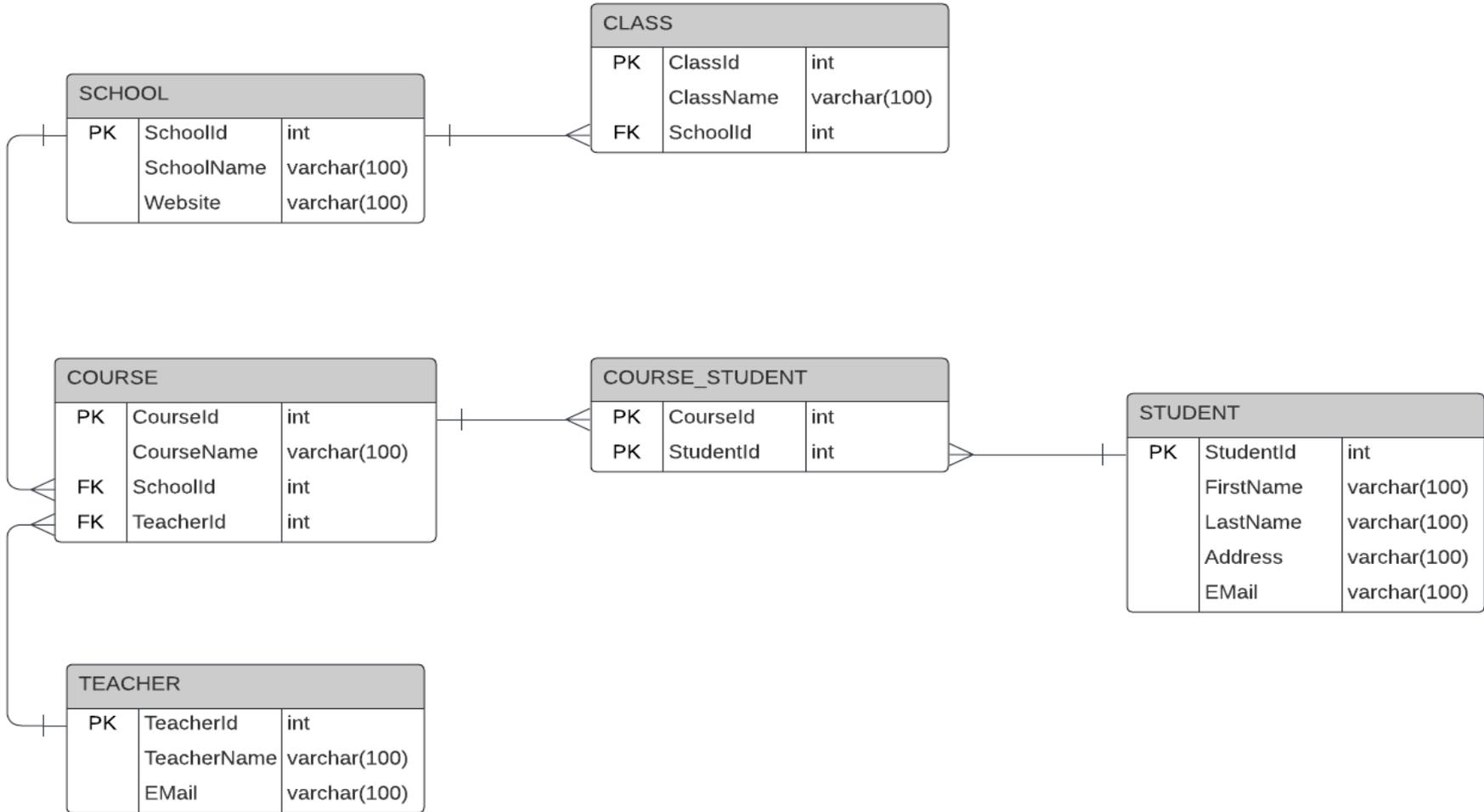


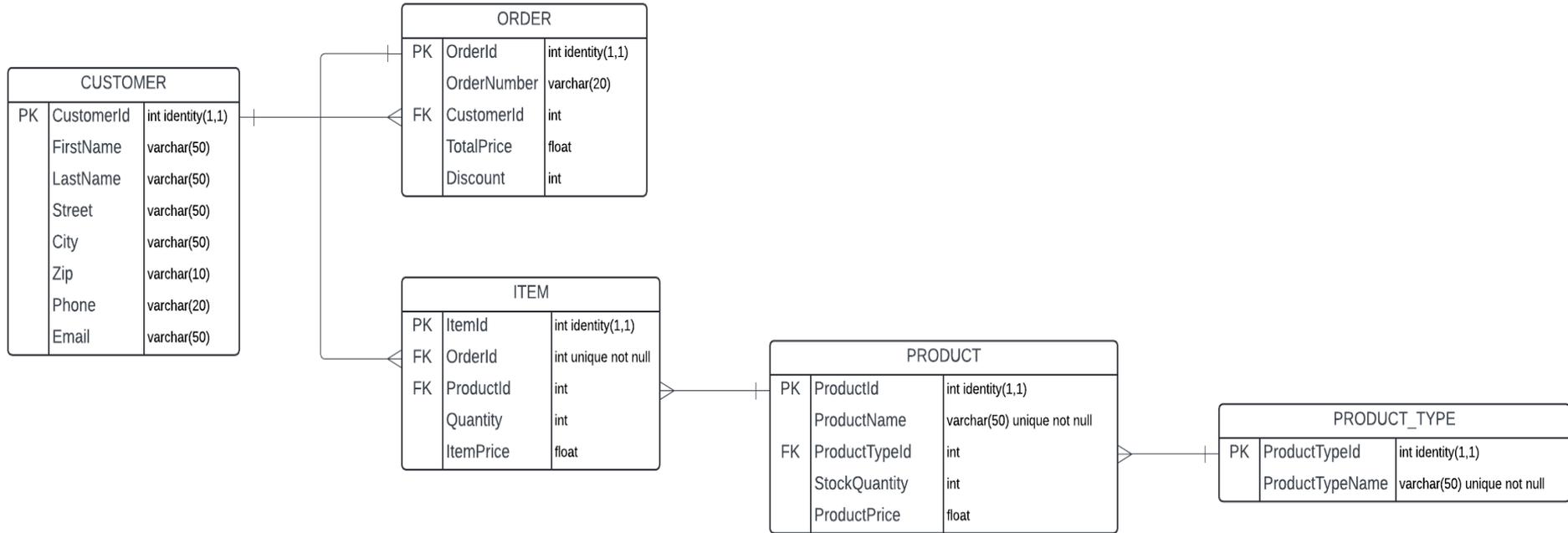
ERD – Entity Relationship Diagram

Relationships illustrate the association between two entities

# Database Modelling Tools

- There exist hundreds of different tools for database design and modelling.
- Most of those cost a lot of money while others has some free alternatives.
- Some tools are specialized for Database Design and Modelling like **erwin Data Modeler**, **MySQL Workbench**, etc.
- While other tools are just general-purpose diagram tools like **Visio**, **Miro**, **Lucidchart**, **Draw.io**, etc.
- The advantage with a specialized Database Design and Modelling tool is that you can generate SQL code for your tables.
- **Lucidchart** has also a simple feature for generating a SQL script.





# Database Tips and Tricks

- It is recommended that you use **UPPERCASES** for TABLENAME.
- It is recommended that you use singular form, e.g., “CUSTOMER” and not “CUSTOMERS” for your table names.
- It is recommended that you use **Pascal notation** for Column names. Table names and column names should also be in English.
- I always prefer to use int for my **Primary keys** and that the Primary Keys are just numbers like 1, 2, 3, etc. In SQL Server you can use **IDENTITY(1,1)** or **AUTO\_INCREMENT** in MySQL.
- Primary Key – Foreign Key relationships ensures that you don’t duplicate data, and you cannot fill in illegal data into the tables. In this case you can only use SensorIds that already exists in the SENSOR table.
- I like to use the same name for the Primary key and the Foreign Key, but it is not necessary.
- It might be useful to use “DirectorName”, “AgentName”, etc. instead of just “Name”, else you will have many tables containing the same name and that can be confusing and more difficult when making SQL queries.
- Stick to a few datatypes, like int, varchar(100), datetime and bit. Easier to remember when creating queries, Stored Procedures, etc,

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ERD – Entity  
Relationship  
Diagram

# Free Plan

Plans & Billing > **Change**

**Current plan**

Free

**\$0.00** per month

VAT excluded  
Free forever

Includes 1 limited license

Products included:  


**Current plan**

**Free includes:**

- ✓ 3 editable Lucidchart documents
- ✓ 60 shapes per Lucidchart document
- ✓ 100 templates
- ✓ Basic Visual Activities
- ✓ Basic data linking
- ✓ Presentation mode
- ✓ Commenting
- ✓ Learning center NEW

Note! With the Free version you can only have 3 editable diagrams Lucidchart diagrams. This means you can only update your 3 recent diagrams.

This is typically good enough for a single project, student work or a student project

You can also create multiple Pages, etc, in one document. This means you can have one ER diagram in each Page inside a Lucidchart diagram

**PREMIUM**

You're trying to access a premium feature. Upgrade to enjoy **Unlimited Editable Documents** and much more.

You're currently on a free account, which allows up to 3 editable documents. If you create a document anyway, one of your documents will become view only. **Upgrade now to get unlimited editable documents and more:**

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# Lucidchart – Create New ERD

The screenshot displays the Lucidchart interface for creating a new Entity Relationship Diagram (ERD). The main window is titled "Blank diagram" and shows a menu bar with options like File, Edit, Select, View, Insert, Arrange, Share, and Help. The left sidebar contains various shape libraries, including Standard, Flowchart, and Entity Relationship. The "Entity Relationship" library is currently selected, showing several ERD shape icons.

The "Insert content" dialog is open, showing a search bar and a list of recommended content. The "Entity Relationship" option is selected in the "Standard libraries" list, and the "Use selected shapes" button is highlighted. The dialog also displays a preview of an ERD diagram and a description: "Entity Relationship Model databases in an easy-to-read format with entity relationship diagrams. You can get started with our shapes, which include constraints, entities, relationships, and attributes."

**Entity Relationship**  
Model databases in an easy-to-read format with entity relationship diagrams. You can get started with our shapes, which include constraints, entities, relationships, and attributes.

Entity Relationship

Equations

Floor Plans

Geometric Shapes

Google Cloud Platform ...

Google Cloud Platform ...

iOS Mockups

Kubernetes

Mind Maps

Network Infrastructure

Oracle Cloud Infrastruc...

Org Charts

Process Engineering

Sales Account Map

**Use selected shapes**

# Templates

You can also start from a Template:

The screenshot displays the Lucid software interface. At the top left, the Lucid logo is visible. A search bar contains the text "er", and a dropdown menu shows a search result for "Blank ERD" dated "Jan 26, 2017". Below the search bar, a navigation menu includes "Home", "Recent", "Starred", "Documents", and "Shared with me". A "Discover" section lists "Templates" and "Integrations". The main content area features a "Jump into something new" section with six template cards: "Network diagram example", "Support process example", "Decision tree", "Use case diagram", "Concept map", and "Algorithm flowchart example". To the right of these cards are buttons for "More templates", "+ Blank whiteboard", and "+ Blank diagram". Below this is a promotional banner for "Discover powerful new capabilities for Agile teams" with a "Watch launch video" button. At the bottom, a "Recent documents" section shows four document thumbnails: "Blank ERD", "Blank diagram", "Blank board", and "School Database". Each document has a "Draft" status indicator.

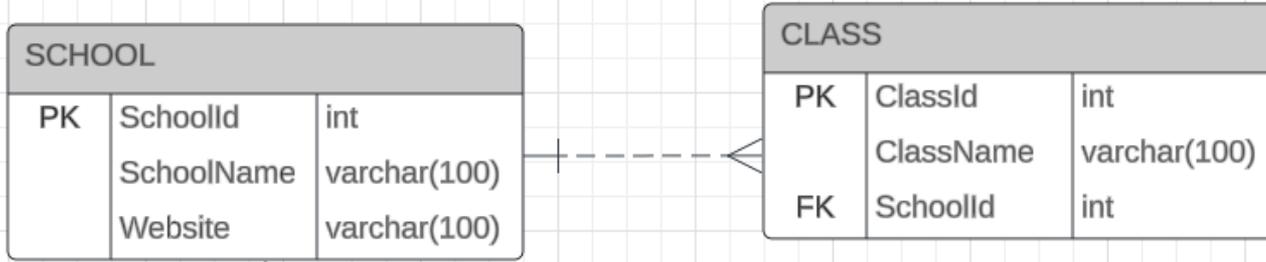
# Templates

You can also start from a Template:

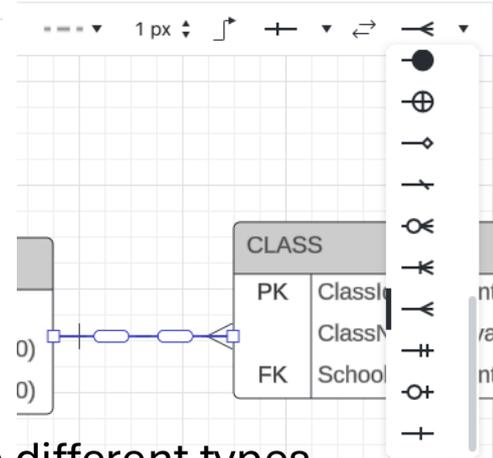
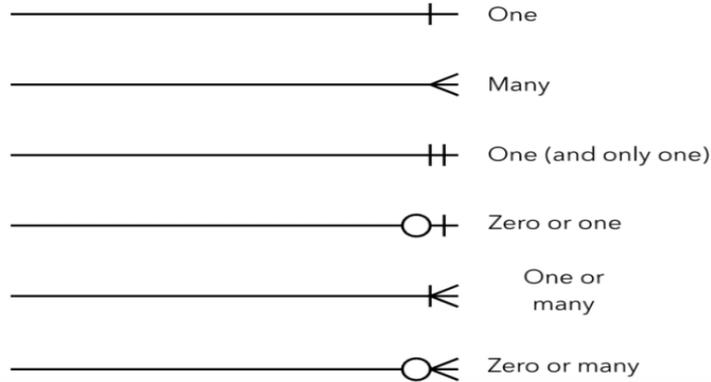
The screenshot displays the Lucid software interface for finding templates. At the top, the Lucid logo is on the left, a search bar contains the word "database", and on the right, there are icons for help, notifications, a "Free plan" button, and an "Upgrade" button. Below the header, a sidebar on the left contains navigation icons: a plus sign, home, clock, star, document, folder, and share. The main content area is titled "Templates" and includes the text "Documents created from templates will be placed in: My documents". A search bar in the top right of the main area also contains "database". Below this, it says "Popular > Showing results for: 'database'" and a dropdown menu is set to "All". The interface shows a grid of 24 template cards, each with a title, a diagram preview, and a "PREMIUM" label at the bottom. The templates include:

- Database ER diagram (crow's foot)
- DBMS ER diagram (UML notation)
- ERD with colored entities (UML notation)
- ERD with colored entities example (UML notation)
- ERD import example
- ERD (crow's foot)
- NoSQL database design example
- Database ER diagram example (crow's foot)
- Entity relationship diagram example (UML...)
- ER diagram
- ER diagram example
- ERD and data flow example
- Hockey game ERD example (crow's foot)
- Logical data model example
- DBMS ER diagram example (UML notation)
- AWS PCI compliance
- Data taxonomy
- Hospital ER diagram example

# Lucidchart – Crowfoot Notation

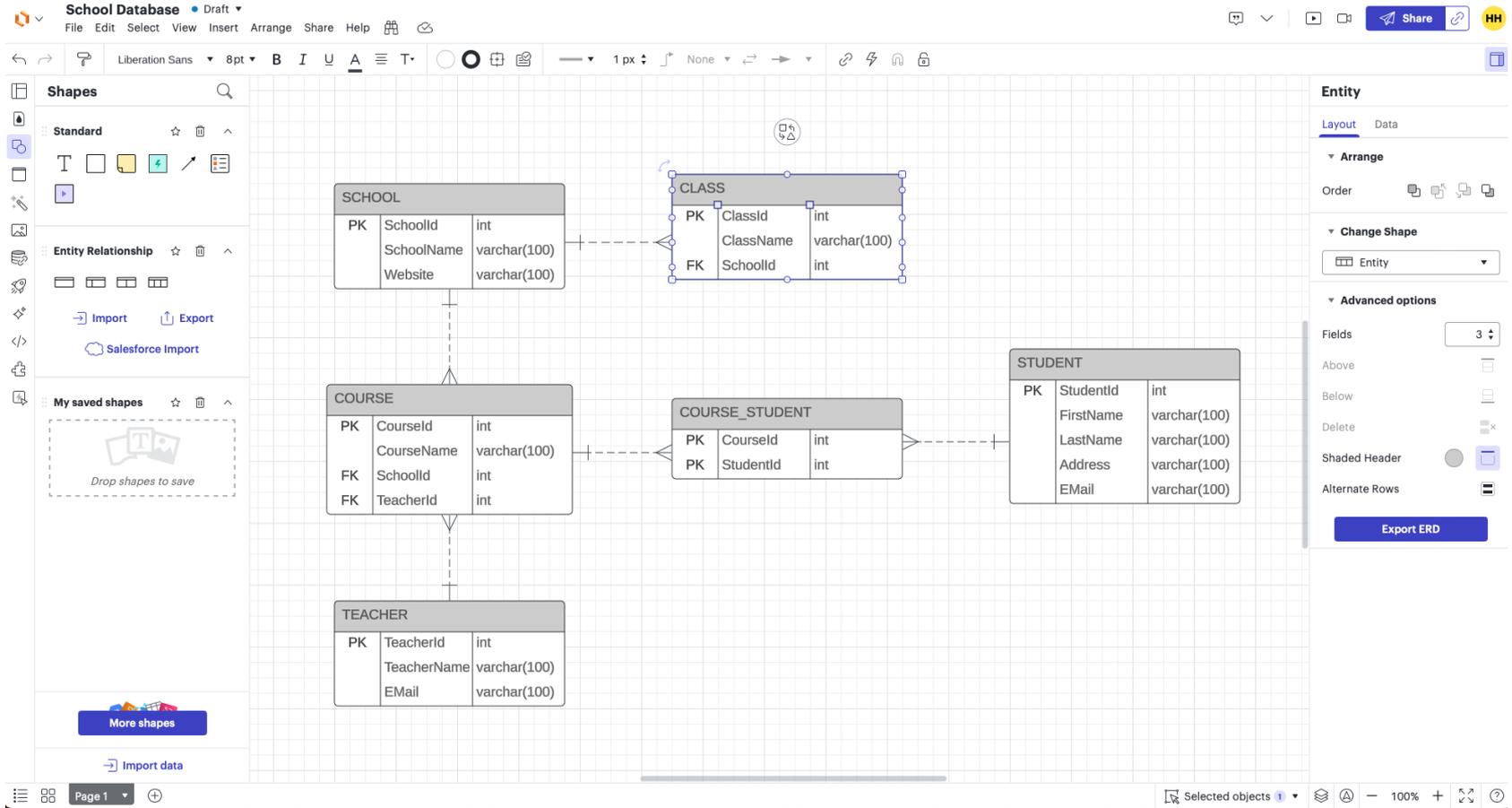


We have different types of relationships between 2 tables, but **most of the time we use a “One-to-many” (1:N) relationship.**



Lucidchart has support for all these different types

# Lucidchart Example



# Export as Image

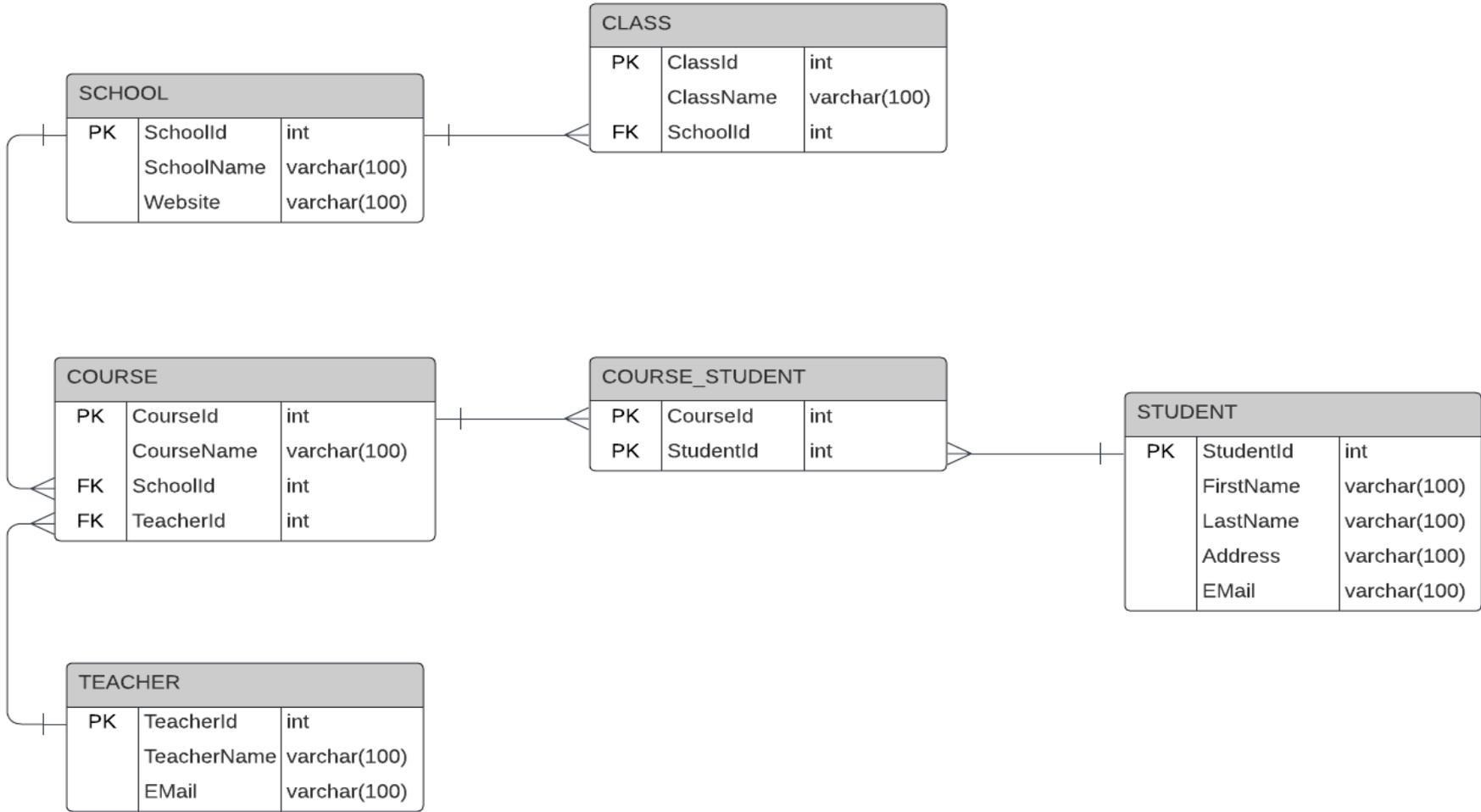
Typically, you want to include your ERD in a report or a PowerPoint, so then you can use the Export function.

The screenshot shows the Lucidspark interface with a database ERD diagram. The diagram includes tables for SCHOOL, CLASS, COURSE\_STUDENT, and STUDENT. The SCHOOL table has attributes SchoolId (PK, int), SchoolName (varchar), and Website (varchar). The CLASS table has attributes ClassId (PK, int), ClassName (varchar(100)), and SchoolId (FK, int). The COURSE\_STUDENT table has attributes CourseId (PK, int) and StudentId (FK, int). The STUDENT table has attributes StudentId (PK, int), FirstName (varchar(100)), LastName (varchar(100)), Address (varchar(100)), and Email (varchar(100)).

The 'Export' menu is open, showing options: Lucidspark, PDF, PNG, PNG with transparent background, JPEG, SVG, SVG with transparent background, Slides to Google Slides, CSV of shape data, Visio (VSDX), and Visio 2010 (VDX). The 'PNG' option is highlighted.

On the right side, there is a 'Download' dialog box with the following options:

- Cancel
- Download
- Options
- File format: PNG
- Crop: Crop to content
- Quality: Screen quality (160 PPI)
- Include Page Fill:



# Export to SQL

The screenshot shows a database design tool interface. On the left, there are panels for 'Shapes' and 'Entity Relationship'. The 'Entity Relationship' panel has an 'Export' button highlighted with a red box. The main workspace displays an Entity Relationship Diagram (ERD) with three tables: SCHOOL, COURSE, and TEACHER. The SCHOOL table has a primary key (PK) on SchoolId and foreign keys on SchoolName and Website. The COURSE table has a primary key (PK) on CourseId and foreign keys on SchoolId and TeacherId. The TEACHER table has a primary key (PK) on TeacherId and foreign keys on TeacherName and EMail. A dialog box titled 'Export to ERD Data' is open, showing options for the database system and the generated SQL script.

**SCHOOL**

PK	SchoolId	int
	SchoolName	varchar(100)
	Website	varchar(100)

**COURSE**

PK	CourseId	int
	CourseName	varchar(100)
FK	SchoolId	int
FK	TeacherId	int

**TEACHER**

PK	TeacherId	int
	TeacherName	varchar(100)
	EMail	varchar(100)

**STUDENT**

PK	StudentId	int
	FirstName	varchar(100)
	LastName	varchar(100)
	Address	varchar(100)
	EMail	varchar(100)

**Export to ERD Data**

Which system are you using?

- MySQL
- PostgreSQL
- SQL Server
- Oracle SQL
- Quickbase <sup>1</sup>

**Export**

Copy and paste the commands below into your database or application. You may need to add data types, indices, or foreign keys.

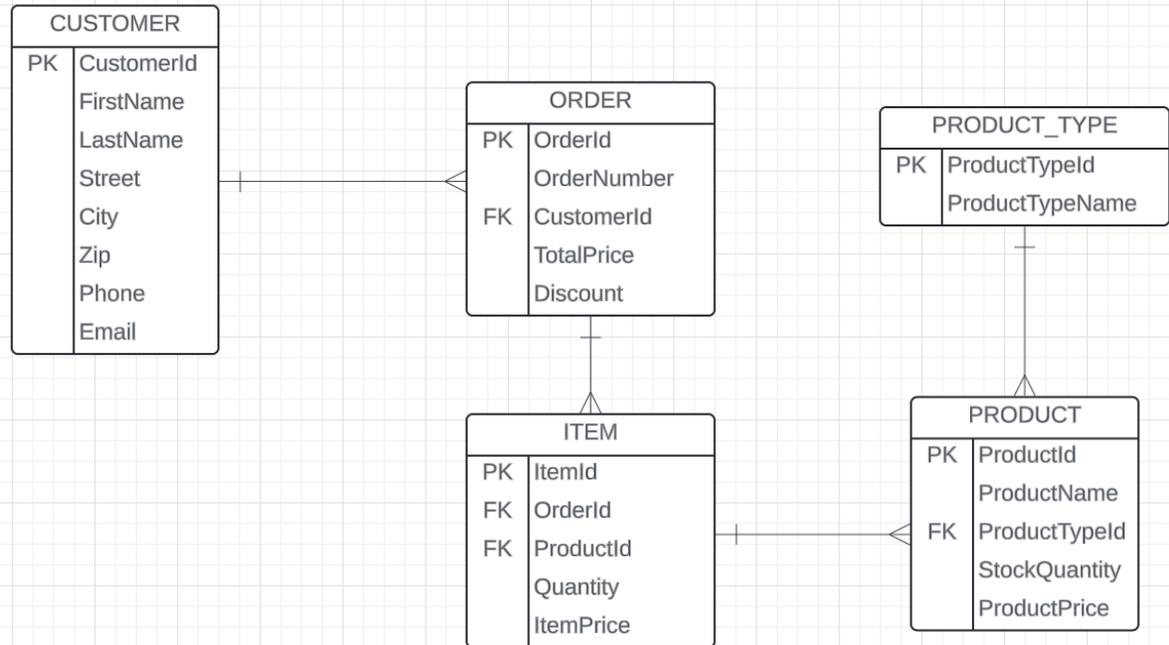
```
CREATE TABLE [COURSE] (  
  [CourseId] int,  
  [CourseName] varchar(100),  
  [SchoolId] int,  
  [TeacherId] int,  
  PRIMARY KEY ([CourseId])  
);  
  
CREATE TABLE [SCHOOL] (  
  [SchoolId] int,  
  [SchoolName] varchar(100),  
  [Website] varchar(100),  
);
```

[Copy to Clipboard](#)

These Tables can now be easily exported as a SQL script and be inserted into SQL Server, MySQL, etc.

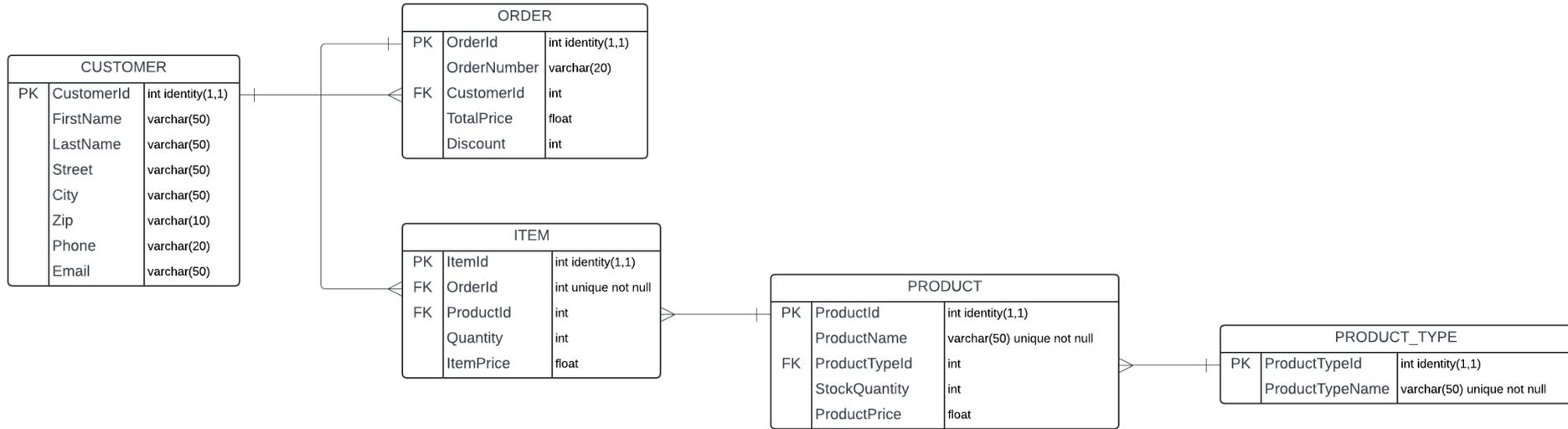
# Order System Example

- Customers
- Products
- Orders
- ..



# Order System

Here you see the final Order System with data types, etc.



These Tables can now be easily exported as a SQL script and be inserted into SQL Server

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