A Nice New Table

Name:	Class:	Date:

This worksheet follows on from Creating a Database

All data in an SQL database is formed into relationships.

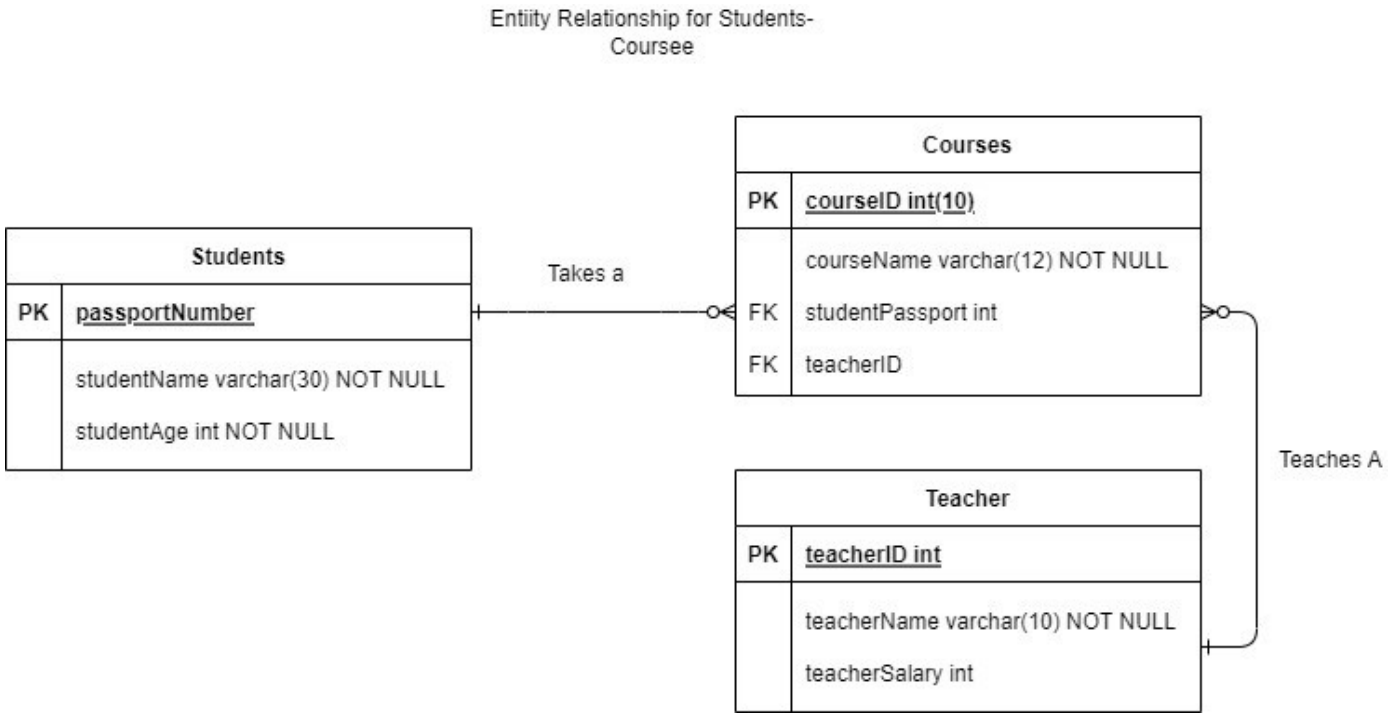
The first process involved is to determine what entities exist in the database, these entities will then become tables.

Each table describes on specific entity, for example, a classroom, a class, and a student are entities.

These entities then have attributes that describe them. For example, a room may have an ID, capacity, location, etc. These then become fields in the table.

The below entity relationship diagram shows relationships between students, courses, and teachers.

It is important to be aware of Primary Keys and Foreign Keys.



It is these keys that form relationships between tables and uniquely identifies a row in each table.

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To create a table there are some components that must be defined from the start. Theses are:

- Name
- Fields
- Datatypes
- Key (recommended but can be done later)
- Constraints
- AUTO_INCREMENT
- NOT NULL
- ENUM (List of options)
- DEFAULT

Task 1: Creating a table.

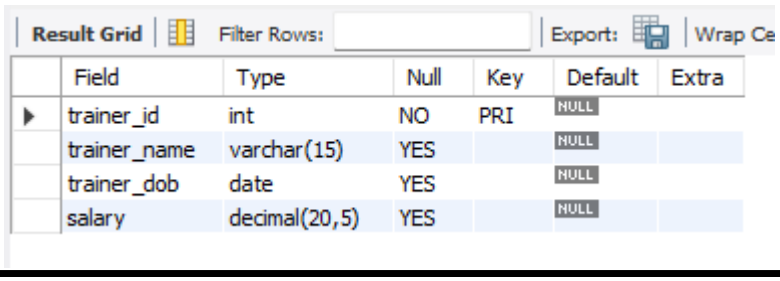
In the **class** database from the previous worksheet, you will create a table name **trainer** with the fields, keys, and data types below.

CREATE TABLE trainer(trainer_id INT PRIMARY KEY, trainer_name VARCHAR(15), trainer_dob DATE, salary DECIMAL(20,5));

When your refresh your schema you will find that there is now a table complete with fields.

We can use the DESCRIBE command to see inside the table's schema.

DESCRIBE trainer;



Field	Type	Null	Key	Default	Extra
trainer_id	int	NO	PRI	NULL	
trainer_name	varchar(15)	YES		NULL	
trainer_dob	date	YES		NULL	
salary	decimal(20,5)	YES		NULL	

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Task 2: Another Table for students

To make this more challenging the code will not be provided, only a table describing student.

Table: Students

Field Name	Datatype	Constraints
Student_id	Int	PK AUTO INCREMENT
student_name	Varchar(30)	NOT NULL
age	Int	NOT NULL CHECK (student_age >=18 AND student_age <100)

The CHECK(...) goes after the rest of the field creation following a comma.

Example CREATE TABLE students (fields….., age INT, CHECK(…).

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Task 3: ENUM and Foreign Keys

Now you will create a new table for the subjects being taught.

We want to constrain this using ENUM to stop invalid courses being entered.

Table: Subjects

Field Name	Datatype	Constraints
subject_id	INT	PK AU- TO_INCREMENT
trainer_id	INT	NOT NULL FK
subject_name	ENUM (‘Database’, ‘Web Development’, ‘Software Devel-opment’)	DEFAULT ‘Database’
start_date	DATE	NOT NULL

You need to make sure your FK is named:

CONSTRAINT trainer_id FOREIGN KEY(trainer_id) REFERENCES trainer(trainer_id)

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To use ENUM and DEFAULT they are included as part of the field:

subject_name ENUM ('Database', 'Web Develpment', 'Software Development') DEFAULT 'Database'

To use a Foreign Key it is done in after all the fields:

CREATE … (fields …, FOREIGN KEY(trainer_id) REFERENCES trainer(trainer_id))

If you do get any errors it will usually mean the structure of the query is incorrect or you have misnamed the foreign key's table or field.

Challenges

You can alter a table using ALTER TABLE *table_name* to:

- ADD *field_name datatype*;
- DROP COLUMN *field_name*;
- MODIFY COLUMN *field_name datatype constraints*;
- RENAME TO *table_name*;
- REMANE COLUMN *field_name* To *new_field_name*;
- ADD PRIMARY KEY (*field_name*);
- DROP PRIMARY KEY;

Example:

ALTER TABLE students ADD passport INT;

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Challenge 1 — New Fields

Create the following fields in students.

passport INT

first_name varchar(30)

Last_name varchar(30)

Challenge 2 — Dropping fields

As we have split the student's name we can now DROP the student_name.

Challenge 3 — Rename a table

The table trainers needs to be renamed to teachers.

Challenge 4 — Drop your keys

Drop the primary key from students (You have to alter the datatype first).

Challenge 5 — Rename fields

Rename student_id to student_number

Challenge 6 — Find your keys

Make the student_number the Primary Key of students.

Challenge 7 — Modify the data type

Modify the teachers so that the datatype of salary is DECIMAL(18,5) DEFAULT 30000.10;