# HW 3 – Practical Databases

## Guidelines:

### Submissions:

* The assignment must be submitted by 9.7.23 at 23:59.
* The solution will be submitted through the model in a PDF and ipynb files.
* The solution file should be written in a word processor (e.g., Word or Pages) or in a clear handwritten.
* The submission is in pairs only, the ID number of each one must be stated in the solution.
* The files names will be of the form EX3\_FULLNAME1\_ FULLNAME2.pdf, EX3\_ FULLNAME1\_ FULLNAME2.ipynb.
* Only one group member is required to upload the solution.
* Any deviation from these principals, without a written approval of the course staff, will resolve in reducing points from the assignment.

### Questions and solutions:

* Read the questions carefully and answer exactly what you were asked to do.
* The style of the solutions should be in line with what is learned in the course.
* Do not copy solutions! Copying solutions will resolve of a zero grade for the task.
* Administrative emails on work-related questions should be sent to jiayu.guan01@post.runi.ac.il (no technical questions).
* Submit your technical questions on Piazza, please check if there is already the same question you want to ask.
* For clarifications or any other assistance, reception hours are also available by appointment.

### Checking:

* Only predetermine questions are graded. Empty answers will resolve in reducing points from the assignment.

In this exercise you are requested to build your own database and show some interesting insights from it. Please finish reading all the instruction and then begin the exercise.

Diagram

Description automatically generated

In most databases we need to understand the user needs and creates from it an ERD; then we program it to a database. In this exercise we want to mimic this experience. You will play both rules, once as a user provide a story and an ERD from it. Then as a developer that get an ERD and then implement it to a database.

You also should retrieve meaningful insights that relevant for the story.

Question 1 – Database intro [10 points]:

Please provide your own database scenario.

Make sure your database is meet with the following properties:

* At least 6 different entities.
* One entity needs to follow a one kind of generalization (covering/overlapping).
* At least 4 different relationships (connection between the entities):
  + one of them is a trinary connection.
  + one is a unary connection.
* For each entity provide at least 3 attributes. Think which one will be a primary key and why.

In addition, provide a short explanation why you choose this database and a short description for the mentioned properties (entities, keys, connections, etc.).

Question 2 – ERD [30 points]:

Provide an entity relation diagram (ERD) for the created database from question 1.

Please provide a short explanation of the diagram and why you choose to model each part.

Question 3 – Code the database [50 points]:

Create the database using sqllite3 (using the notebook from lecture 9). Give seven meaningful insights from your created dataset. You need to use at least once with joins, aggregation operations, summarize functions, and the like operator for your insights.

You should note the following:

* You need to determine the database scheme. The relations number should be greater than the number of entities.
* You need data to insert it to the relations (please view Creativity section).

Creativity [10 points]:

Since this is your decision of the database data, a more creative dataset will get more points. A low creative dataset like random numbers will get no points on creativity section.

Bonus [10 points]:

Make two (each 5 point) more operations on the created dataset that aren’t showed at class (each need to be of a different kind). Please state whether you do this section. (More operations won’t resolve in more points…)

Make sure you are submitting two files; one is a pdf file that covers question 1 and 2. This file should also contain an executive summary (at most two pages long) of what you did in the code (question 3) and what was creative in your dataset and whether you choose to do the bonus section or not.

**In addition, provide the notebook file (ipynb).**