Internet Technologies – PROJECT (max 50 points)

Use of AI for this assignment: **ALLOWED**

Select ONE of the two available variants of the final project. The indicated score is the maximum possible number of points, in case of non-fulfillment/partial fulfillment of the requirements the grade will be lowered.

**Limitations:**

No "I did it for work" projects. No copying of existing tutorials

## Option A

Build an application using any frontend and backend technologies. The application should meet the following requirements (requirements specified for each level, to receive a score you must also meet all requirements for lower levels):

### Level 1 (10 points):

* At least 3 connected database tables (including one many-to-many relationship with at least one additional column in addition to foreign keys in the connecting table)
* At least 3 different types of columns
* At least 2 columns in each table (in addition to the primary key)

Functionalities:

* Adding, updating, deleting records to the database
* Displaying a list of all records for each table (only the most important columns)
* Displaying detailed views (all columns + records connected by relationships)
* Data validation on the client and server side

Constraints:

* SQLite, MySQL or MongoDB as a database, the project must contain easy-to-follow instructions for updating database connection information

The solution must include:

* Frontend and backend application code
* Database creation script
* Database script for creating sample data
* Any compilation scripts etc. used to build the application

### Level 2 (20 points):

Additional functionalities:

* Registration and login (including necessary database tables)
* Different functionalities depending on user status (logged in/guest) - e.g. only logged in users can modify data
* Pagination of displayed lists

### Level 3 (20 points):

Additional requirements:

* The frontend application should be built as a Single Page Application

Additional functionalities:

* At least 3 user roles (e.g. logged in, guest, administrator) with different available functionalities
* Introduction of resource-level permissions (e.g. a customer can only view their own orders, a manager can view and update only employee data from your department)
* Internationalization (at least 2 languages)

## Option B

Build a frontend application in the form of a single-player game (something simple - a simple platformer, a Pacman or Space Invaders clone, a side-scrolling shooter, tower defense game...). This application should be built in JavaScript using standard JS browser APIs (Canvas etc.) or using a framework or library of your choice that supports JavaScript/TypeScript game development. Cross-platform tools like Unity etc. are not allowed. The application should meet the following requirements (requirements specified for each grade, to receive a higher grade you must also meet all requirements of lower grades):

*Make sure you have agreed on your game idea with the tutor, as this is a slightly more "free-form" project.*

### (5 points):

* A basic Node.js application (you can use Express.js) to serve static content (HTML page, game script, other resources)
* The game itself (2D graphics on Canvas, keyboard or mouse input)

Restrictions:

* Use only your own or public domain assets, don’t use assets ripped from existing games

Requirements:

* The game should be playable
* It should include some basic behavior of NPCs/opponents (movement/attack/whatever)

### (10 points):

Additional requirements:

* A scoring mechanism, high score table maintained on the backend. Communication between the backend and frontend should include data validation on both sides of the communication.
* Separate title screen, game screen and game over/high score screen

Constraints:

* SQLite, MySQL or MongoDB as a database, the project must contain easy-to-follow instructions for updating database connection information

### (15 points):

Additional requirements:

* Sound (music and game effects), with the ability to turn off the sound (music and effects separately)
* More than one game level