



DataBase Architecture

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Overview

Code Ed is a comprehensive and user-friendly platform that enables learners of all levels to master coding skills. Through interactive tutorials, real-time coding challenges, and engaging projects, users can explore various programming languages.

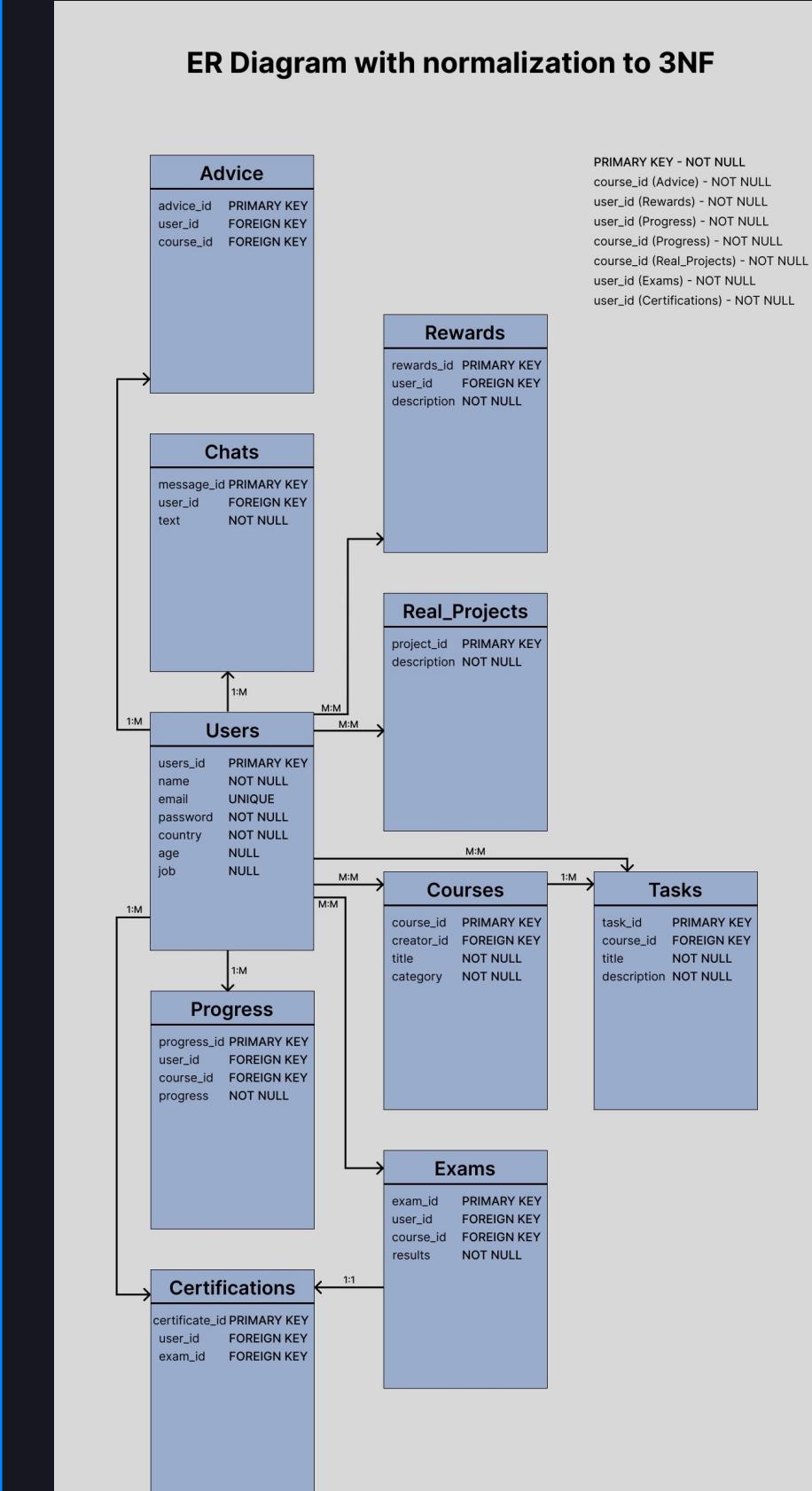
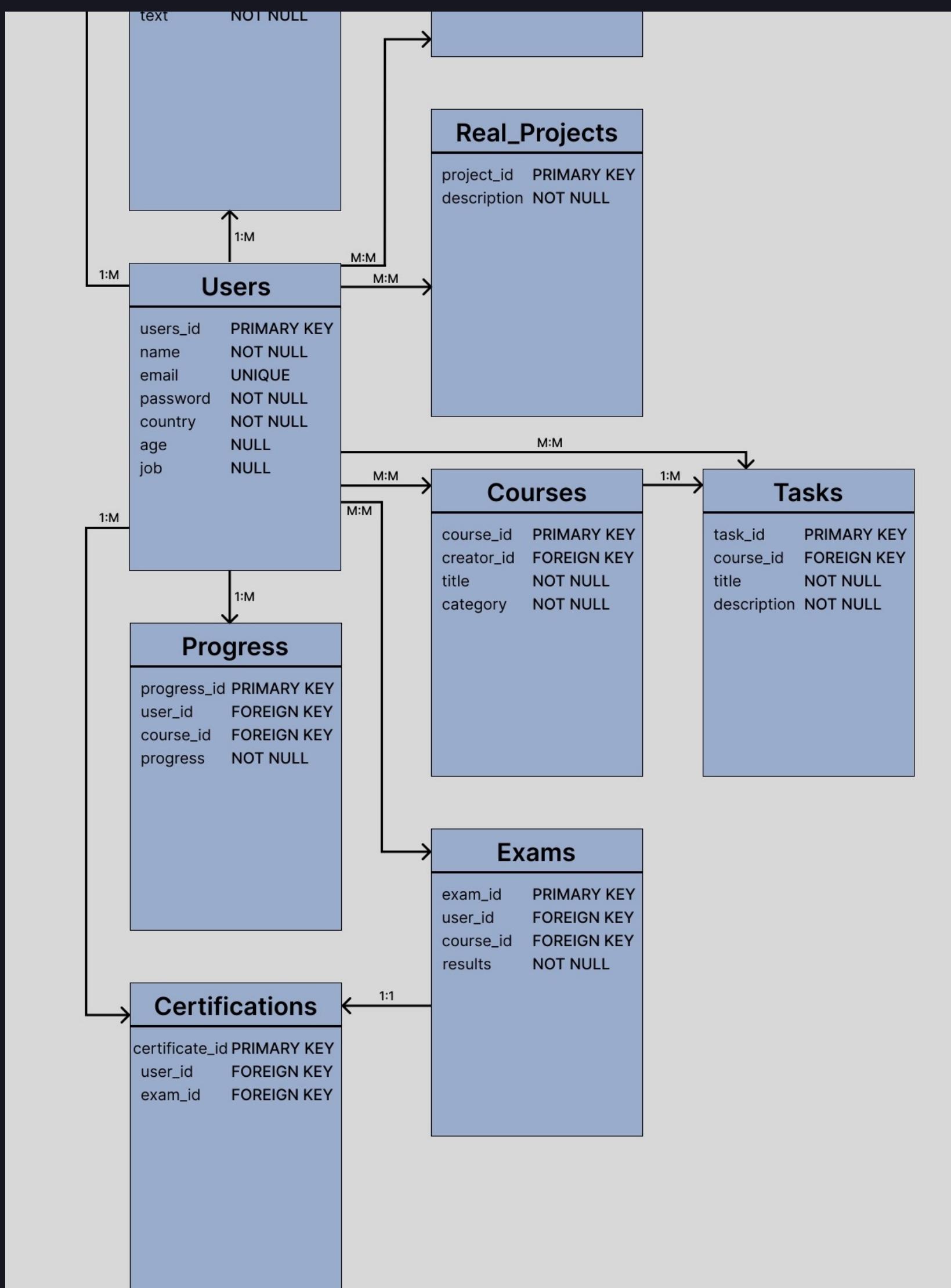
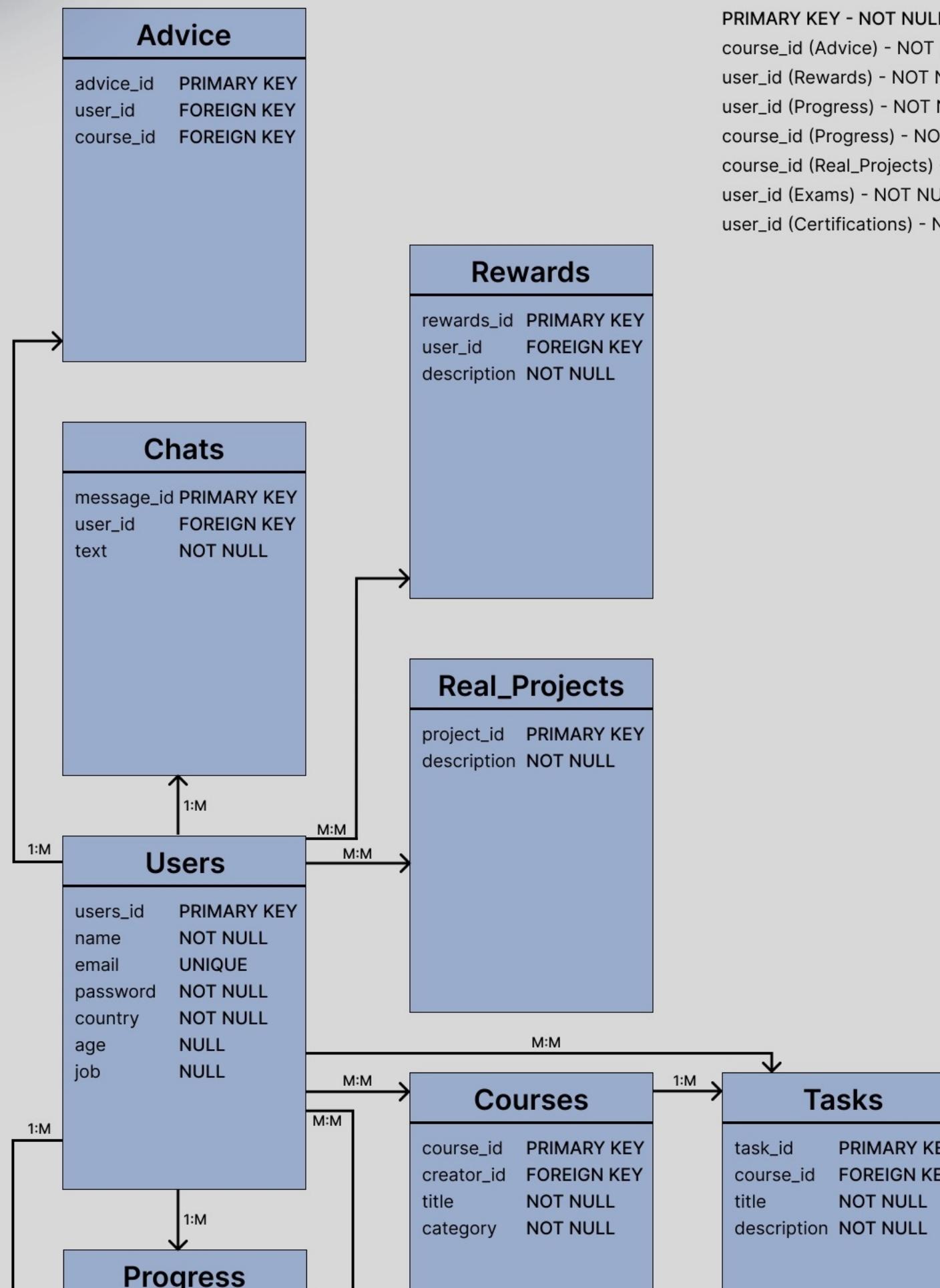
AI

With AI-powered recommendations, personalized support from Code Eddie, and the ability to track progress, Code Ed provides a seamless learning experience.





ER Diagram with normalization to 3NF





```
4
5 • Ⓛ CREATE TABLE Users (
6     user_id INT AUTO_INCREMENT,
7     name VARCHAR(50) NOT NULL,
8     email VARCHAR(50) NOT NULL UNIQUE,
9     password VARCHAR(255) NOT NULL,
10    job VARCHAR(50),
11    age INT,
12    country VARCHAR(50),
13    PRIMARY KEY (user_id)
14 );
15
16 • Ⓛ CREATE TABLE Courses (
17     course_id INT AUTO_INCREMENT,
18     title VARCHAR(100) NOT NULL,
19     description TEXT,
20     PRIMARY KEY (course_id)
21 );
22
```



SCHEMAS

Filter objects

codeed

Tables

- ai_advice
- certifications
- courses
- exams
- real_projects
- tasks
- users
- users_advice
- users_courses
- users_exams
- users_projects
- users_tasks

Views

Stored Procedures

Functions

sys

A screenshot of a database schema browser window titled "SCHEMAS". The window shows a tree structure of database objects. At the top level is the schema "codeed", which is expanded to show its contents. Under "Tables", there are eleven entries: "ai_advice", "certifications", "courses", "exams", "real_projects", "tasks", "users", "users_advice", "users_courses", "users_exams", and "users_projects", "users_tasks". These last four entries are highlighted with a red rectangular box. Below "Tables" are three more categories: "Views", "Stored Procedures", and "Functions". At the bottom of the list is the "sys" schema. A search bar at the top is labeled "Filter objects".



```
1  -- Insert data into Users
2 • INSERT INTO Users (user_id, name, email, password, age, country)
3   VALUES
4   (1, 'John Doe', 'johndoe@email.com', 'johnspassword', 30, 'USA'),
5   (2, 'Jane Smith', 'janeshmith@email.com', 'janespASSWORD', 25, 'UK')
6   (3, 'Alice Johnson', 'alicejohnson@email.com', 'alicespASSWORD', 35
7
8   -- Insert data into Courses
9 • INSERT INTO Courses (course_id, title, description)
10  VALUES
11  (1, 'Python for Beginners', 'Learn Python from scratch'),
12  (2, 'Advanced Java', 'Deep dive into Java and its advanced features')
13  (3, 'Web Development with JavaScript', 'Become a proficient web dev
14
15  -- Insert data into Tasks
16  INSERT INTO Tasks (task_id, course_id, title, description)
17  VALUES
18  (1, 1, 'Python Basics', 'Learn the basics of Python programming'),
19  (2, 1, 'Data Structures', 'Understand basic data structures like lists and dictionaries'),
20  (3, 1, 'Control Flow', 'Master loops and conditionals in Python'),
21  (4, 1, 'Functions', 'Learn how to define and use functions in Python'),
22  (5, 1, 'OOP in Python', 'Explore Object-Oriented Programming concepts in Python'),
23  (6, 1, 'File I/O', 'Work with files and file operations in Python'),
24  (7, 1, 'Regular Expressions', 'Learn how to use regular expressions in Python'),
25  (8, 1, 'Database Integration', 'Understand how to interact with databases using Python'),
26  (9, 1, 'Testing', 'Get started with unit testing in Python using frameworks like pytest'),
27  (10, 1, 'Performance Optimization', 'Learn how to optimize Python code for better performance'),
28  (11, 1, 'Concurrency', 'Understand how to handle concurrent tasks in Python using threads and asyncio'),
29  (12, 1, 'Machine Learning', 'Get an introduction to machine learning with Python libraries like scikit-learn'),
30  (13, 1, 'Data Visualization', 'Learn how to create visualizations with Python libraries like matplotlib and seaborn'),
31  (14, 1, 'Web Scraping', 'Understand how to extract data from websites using Python libraries like BeautifulSoup and requests'),
32  (15, 1, 'APIs', 'Learn how to build and consume APIs with Python libraries like Flask and Django'),
33  (16, 1, 'Cloud Computing', 'Get an introduction to cloud computing and how to use Python libraries like boto3 to interact with AWS services'),
34  (17, 1, 'Big Data', 'Understand how to process big data with Python libraries like pandas and dask'),
35  (18, 1, 'Scientific Computing', 'Learn how to perform scientific computing with Python libraries like numpy and scipy'),
36  (19, 1, 'Numerical Methods', 'Understand how to implement numerical methods in Python for solving mathematical problems'),
37  (20, 1, 'Game Development', 'Get an introduction to game development with Python libraries like pygame and Pygame Zero'),
38  (21, 1, 'Robotics', 'Understand how to control robots with Python libraries like pybullet and ROS'),
39  (22, 1, 'Embedded Systems', 'Learn how to interface with embedded systems using Python libraries like RPi.GPIO and Adafruit_BBIO'),
40  (23, 1, 'Hardware Acceleration', 'Understand how to use hardware acceleration with Python libraries like OpenBLAS and MKL'),
41  (24, 1, 'Parallel Processing', 'Learn how to parallelize tasks with Python libraries like multiprocessing and concurrent.futures'),
42  (25, 1, 'GPU Computing', 'Understand how to use GPU computing with Python libraries like CUDA and cuDNN'),
43  (26, 1, 'Quantum Computing', 'Get an introduction to quantum computing with Python libraries like Qiskit and Cirq'),
44  (27, 1, 'Bioinformatics', 'Understand how to perform bioinformatics analysis with Python libraries like Biopython and NumpyBio'),
45  (28, 1, 'Chemistry', 'Understand how to perform chemistry calculations with Python libraries like OpenBabel and RDkit'),
46  (29, 1, 'Physics', 'Understand how to perform physics calculations with Python libraries like NumPy and SciPy'),
47  (30, 1, 'Mathematics', 'Understand how to perform mathematical calculations with Python libraries like SymPy and NumpyMath'),
48  (31, 1, 'Finance', 'Understand how to perform financial calculations with Python libraries like NumPyFinance and SciPyFinance'),
49  (32, 1, 'Statistics', 'Understand how to perform statistical calculations with Python libraries like NumPyStatistics and SciPyStatistics'),
50  (33, 1, 'Machine Learning', 'Understand how to perform machine learning with Python libraries like TensorFlow and PyTorch'),
51  (34, 1, 'Natural Language Processing', 'Understand how to perform natural language processing with Python libraries like TensorFlowNLP and PyTorchNLP'),
52  (35, 1, 'Computer Vision', 'Understand how to perform computer vision with Python libraries like TensorFlowCV and PyTorchCV'),
53  (36, 1, 'Robotics', 'Understand how to perform robotics with Python libraries like TensorFlowRobotics and PyTorchRobotics'),
54  (37, 1, 'Game Development', 'Understand how to perform game development with Python libraries like TensorFlowGameDev and PyTorchGameDev'),
55  (38, 1, 'Hardware Acceleration', 'Understand how to perform hardware acceleration with Python libraries like TensorFlowHardware and PyTorchHardware'),
56  (39, 1, 'Parallel Processing', 'Understand how to perform parallel processing with Python libraries like TensorFlowParallel and PyTorchParallel'),
57  (40, 1, 'GPU Computing', 'Understand how to perform GPU computing with Python libraries like TensorFlowGPU and PyTorchGPU'),
58  (41, 1, 'Quantum Computing', 'Understand how to perform quantum computing with Python libraries like TensorFlowQuantum and PyTorchQuantum'),
59  (42, 1, 'Bioinformatics', 'Understand how to perform bioinformatics with Python libraries like TensorFlowBio and PyTorchBio'),
60  (43, 1, 'Chemistry', 'Understand how to perform chemistry with Python libraries like TensorFlowChem and PyTorchChem'),
61  (44, 1, 'Physics', 'Understand how to perform physics with Python libraries like TensorFlowPhys and PyTorchPhys'),
62  (45, 1, 'Mathematics', 'Understand how to perform mathematics with Python libraries like TensorFlowMath and PyTorchMath'),
63  (46, 1, 'Finance', 'Understand how to perform finance with Python libraries like TensorFlowFin and PyTorchFin'),
64  (47, 1, 'Statistics', 'Understand how to perform statistics with Python libraries like TensorFlowStat and PyTorchStat'),
65  (48, 1, 'Machine Learning', 'Understand how to perform machine learning with Python libraries like TensorFlowML and PyTorchML'),
66  (49, 1, 'Natural Language Processing', 'Understand how to perform natural language processing with Python libraries like TensorFlowNLP and PyTorchNLP'),
67  (50, 1, 'Computer Vision', 'Understand how to perform computer vision with Python libraries like TensorFlowCV and PyTorchCV'),
68  (51, 1, 'Robotics', 'Understand how to perform robotics with Python libraries like TensorFlowRobotics and PyTorchRobotics'),
69  (52, 1, 'Game Development', 'Understand how to perform game development with Python libraries like TensorFlowGameDev and PyTorchGameDev'),
70  (53, 1, 'Hardware Acceleration', 'Understand how to perform hardware acceleration with Python libraries like TensorFlowHardware and PyTorchHardware'),
71  (54, 1, 'Parallel Processing', 'Understand how to perform parallel processing with Python libraries like TensorFlowParallel and PyTorchParallel'),
72  (55, 1, 'GPU Computing', 'Understand how to perform GPU computing with Python libraries like TensorFlowGPU and PyTorchGPU'),
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76  (59, 1, 'Physics', 'Understand how to perform physics with Python libraries like TensorFlowPhys and PyTorchPhys'),
77  (60, 1, 'Mathematics', 'Understand how to perform mathematics with Python libraries like TensorFlowMath and PyTorchMath'),
78  (61, 1, 'Finance', 'Understand how to perform finance with Python libraries like TensorFlowFin and PyTorchFin'),
79  (62, 1, 'Statistics', 'Understand how to perform statistics with Python libraries like TensorFlowStat and PyTorchStat'),
80  (63, 1, 'Machine Learning', 'Understand how to perform machine learning with Python libraries like TensorFlowML and PyTorchML'),
81  (64, 1, 'Natural Language Processing', 'Understand how to perform natural language processing with Python libraries like TensorFlowNLP and PyTorchNLP'),
82  (65, 1, 'Computer Vision', 'Understand how to perform computer vision with Python libraries like TensorFlowCV and PyTorchCV'),
83  (66, 1, 'Robotics', 'Understand how to perform robotics with Python libraries like TensorFlowRobotics and PyTorchRobotics'),
84  (67, 1, 'Game Development', 'Understand how to perform game development with Python libraries like TensorFlowGameDev and PyTorchGameDev'),
85  (68, 1, 'Hardware Acceleration', 'Understand how to perform hardware acceleration with Python libraries like TensorFlowHardware and PyTorchHardware'),
86  (69, 1, 'Parallel Processing', 'Understand how to perform parallel processing with Python libraries like TensorFlowParallel and PyTorchParallel'),
87  (70, 1, 'GPU Computing', 'Understand how to perform GPU computing with Python libraries like TensorFlowGPU and PyTorchGPU'),
88  (71, 1, 'Quantum Computing', 'Understand how to perform quantum computing with Python libraries like TensorFlowQuantum and PyTorchQuantum'),
89  (72, 1, 'Bioinformatics', 'Understand how to perform bioinformatics with Python libraries like TensorFlowBio and PyTorchBio'),
90  (73, 1, 'Chemistry', 'Understand how to perform chemistry with Python libraries like TensorFlowChem and PyTorchChem'),
91  (74, 1, 'Physics', 'Understand how to perform physics with Python libraries like TensorFlowPhys and PyTorchPhys'),
92  (75, 1, 'Mathematics', 'Understand how to perform mathematics with Python libraries like TensorFlowMath and PyTorchMath'),
93  (76, 1, 'Finance', 'Understand how to perform finance with Python libraries like TensorFlowFin and PyTorchFin'),
94  (77, 1, 'Statistics', 'Understand how to perform statistics with Python libraries like TensorFlowStat and PyTorchStat'),
95  (78, 1, 'Machine Learning', 'Understand how to perform machine learning with Python libraries like TensorFlowML and PyTorchML'),
96  (79, 1, 'Natural Language Processing', 'Understand how to perform natural language processing with Python libraries like TensorFlowNLP and PyTorchNLP'),
97  (80, 1, 'Computer Vision', 'Understand how to perform computer vision with Python libraries like TensorFlowCV and PyTorchCV'),
98  (81, 1, 'Robotics', 'Understand how to perform robotics with Python libraries like TensorFlowRobotics and PyTorchRobotics'),
99  (82, 1, 'Game Development', 'Understand how to perform game development with Python libraries like TensorFlowGameDev and PyTorchGameDev'),
100 (83, 1, 'Hardware Acceleration', 'Understand how to perform hardware acceleration with Python libraries like TensorFlowHardware and PyTorchHardware'),
```



✓	13	01:31:47	CREATE TABLE Users_Tasks (user_id INT, task_id INT, FOREIGN KEY (u...
✓	14	01:31:47	CREATE TABLE Users_Advices (user_id INT, advice_id INT, FOREIGN KE...
✓	15	01:36:34	INSERT INTO Users (user_id, name, email, password, age, country) VALUES (1, 'Jo...
✓	16	01:36:34	INSERT INTO Courses (course_id, title, description) VALUES (1, 'Python for Beginn...
✓	17	01:36:34	INSERT INTO Tasks (task_id, course_id, title, description) VALUES (1, 1, 'Python B...



Query 1 x

1 • `select * from users;`
2 • `select * from courses;`
3 • `select * from tasks;`
4 • `select * from exams;`

Result Grid | Filter Rows: Edit: Export/Import: Result Grid

user_id	name	email	password	age	country
1	John Doe	johndoe@email.com	johnspassword	30	USA
2	Jane Smith	janesmith@email.com	janespassword	25	UK
3	Alice Johnson	alicejohnson@email.com	alicespassword	35	Canada
NULL	NULL	NULL	NULL	NULL	NULL

users 6 x courses 7 tasks 8 exams 9 Apply Revert



```
Administrator: Командная строка - mysql -u root -p
Microsoft Windows [Version 10.0.19043.1466]
(c) Корпорация Майкрософт (Microsoft Corporation). Все права защищены.

C:\Windows\system32>cd C:\Program Files\MySQL\MySQL Server 8.0\bin

C:\Program Files\MySQL\MySQL Server 8.0\bin>mysql -u root -p
Enter password: *****
Welcome to the MySQL monitor. Commands end with ; or \g.
Your MySQL connection id is 31
Server version: 8.0.33 MySQL Community Server - GPL

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> show databases;
+-----+
| Database      |
+-----+
| codeed        |
| information_schema |
| mysql          |
| performance_schema |
| sys            |
+-----+
5 rows in set (0.00 sec)

mysql> connect codeed;
Connection id: 32
Current database: codeed

mysql> select * from users;
+-----+-----+-----+-----+-----+
| user_id | name      | email           | password       | age   | country |
+-----+-----+-----+-----+-----+
| 1      | John Doe   | johndoe@email.com | johnspassword | 30   | USA     |
| 2      | Jane Smith  | janessmith@email.com | janespASSWORD | 25   | UK      |
| 3      | Alice Johnson | alicejohnson@email.com | alicespassword | 35   | Canada  |
+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)

mysql>
```



Query 1 ×

1 • Use Codeeed;

2

3 • `SELECT category, COUNT(*) AS course_count
FROM Courses
GROUP BY category;`

4

5

6

7

Result Grid | Filter Rows: | Export: Wrap Cell Content:

category	course_count
Learn Python from scratch	1
Deep dive into Java and its advanced features	1
Become a proficient web developer with JavaScript	1



Query 1 ×

1 • Use Codeed;

2

3 • **SELECT * FROM Courses ORDER BY title ASC;**

4

5

Result Grid | Filter Rows: | Edit: | Export/Import:

	course_id	title	category
▶	2	Advanced Java	Deep dive into Java and its advanced features
	1	Python for Beginners	Learn Python from scratch
	3	Web Development with JavaScript	Become a proficient web developer with JavaScript
*	NULL	NULL	NULL



Query 1

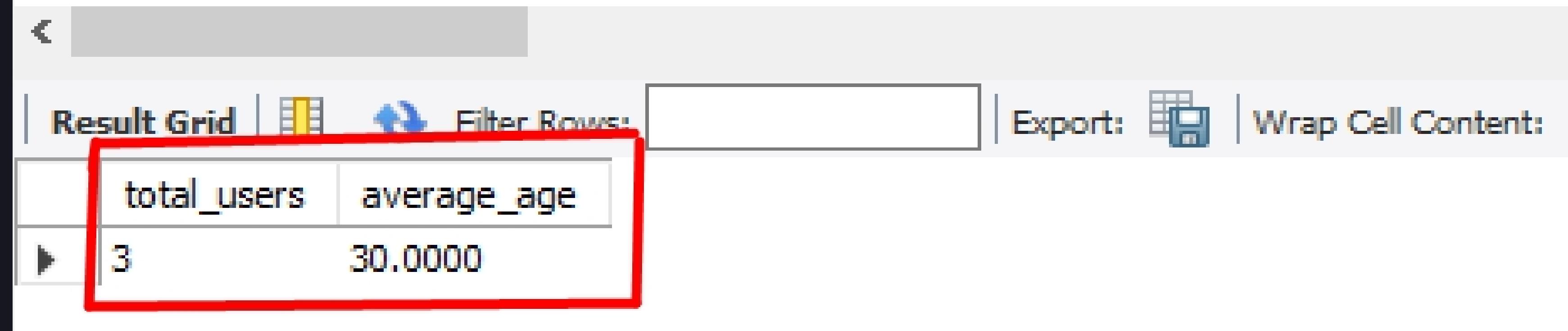


1 Use Codeed

2

```
3 * | SELECT COUNT(*) AS total_users, AVG(age) AS average_age  
4 | FROM Users;
```

5





Thank You!

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