CS 353 Term Project

Design Report

Section 1

Group 35

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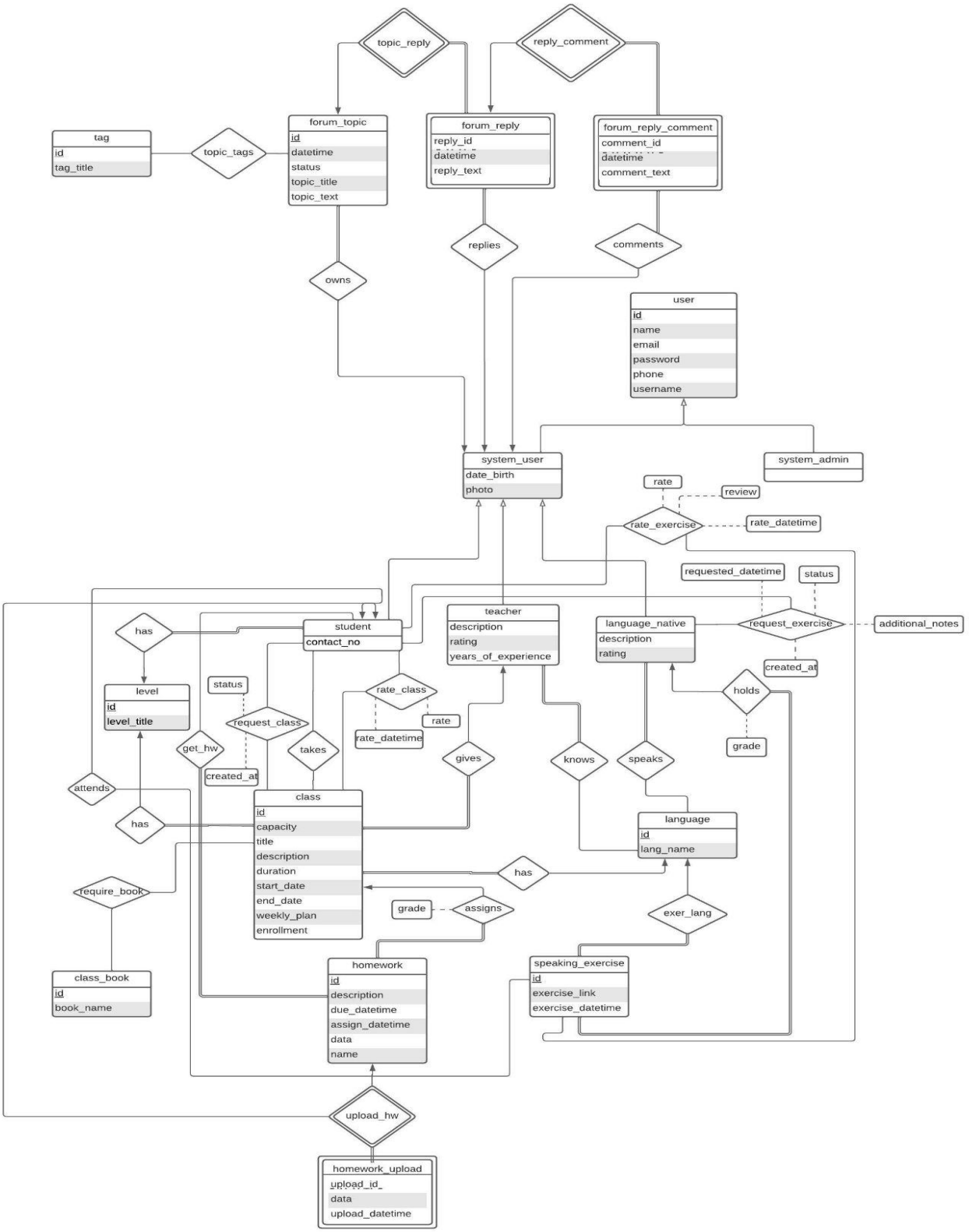
Topic: Online Language Learning Platform

Link: https://online-language-learning-platform.vercel.app

Link to ER Diagram:
https://github.com/ardaatahan/Online-Language-Learning-Platform/blob/main/diagrams/final_er_diagram.md

Revised ER


topic_reply
reply_comment
tag
id
tag_title
topic_tags
forum_topic
id
datetime
status
topic_title
topic_text
forum_reply
reply_id
datetime
reply_text
forum_reply_comment
comment_id
datetime
comment_text
replies
comments
owns
user
id
name
email
password
phone
username
system_user
date_birth
photo
system_admin
rate
review
rate_exercise
rate_datetime
requested_datetime
status
request_exercise
additional_notes
created_at
has
student
contact_no
teacher
description
rating
years_of_experience
language_native
description
rating
level
id
level_title
status
request_class
rate_class
rate
rate_datetime
get_hw
takes
created_at
gives
knows
speaks
holds
grade
attends
has
class
id
capacity
title
description
duration
start_date
end_date
weekly_plan
enrollment
language
id
lang_name
has
require_book
grade
assigns
exer_lang
class_book
id
book_name
homework
id
description
due_datetime
assign_datetime
data
name
speaking_exercise
id
exercise_link
exercise_datetime
upload_hw
homework_upload
upload_id_
data
upload_datetime

Relational Models

1) User

Relational Schema:

user(id, name, email, password, phone, username, contact_no)

Candidate Keys:

Candidate Keys: id, email, username
Primary Key: id

Functional Dependencies:

id->{name, email, password, phone, username}
username->{id, name, email, password, phone}
email->{id, name, password, phone, username}

Normal Form:

BCNF since the left-hand sides of all of the functional dependencies are candidate keys.

SQL Creation:

```
DROP TABLE IF EXISTS user CASCADE;
CREATE TABLE user
(
    id SERIAL NOT NULL,
    name VARCHAR(50) NOT NULL,
    email VARCHAR(60) NOT NULL UNIQUE,
    password VARCHAR(50) NOT NULL,
    phone VARCHAR(20),
    username VARCHAR(50) NOT NULL UNIQUE,
    PRIMARY KEY (id)
);
```

2) System User

Relational Schema:

system_user(user_id, date_birth, photo)

Candidate Keys:

Candidate Key: user_id
Primary Key: user_id

Functional Dependencies:
user_id->{date_birth, photo}

Normal Form:
BCNF since the left-hand sides of all of the functional dependencies are candidate keys.

SQL Creation:
```
DROP TABLE IF EXISTS system_user CASCADE;
CREATE TABLE system_user
(
    user_id INT NOT NULL UNIQUE,
    date_birth DATE,
    photo TEXT,
    PRIMARY KEY (user_id),
    FOREIGN KEY(user_id) REFERENCES user(id) ON DELETE CASCADE
);
```

3) System Admin
Relational Schema:
system_admin(<u>user_id</u>)

Candidate Keys:
Candidate Key: user_id
Primary Key: user_id

Functional Dependencies:
There is no functional dependency.

Normal Form:
BCNF since there is no functional dependency.

SQL Creation:
```
DROP TABLE IF EXISTS system_admin CASCADE;
CREATE TABLE system_admin
(
    user_id INT NOT NULL UNIQUE,
    PRIMARY KEY (user_id),
    FOREIGN KEY(user_id) REFERENCES user(id) ON DELETE CASCADE
);
```

4) Student

Relational Schema:

student(<u>user_id</u>, contact_no, level_id)
FK: user_id references system_user(user_id)
FK: level_id references level(id)

Candidate Keys:

Candidate Key: user_id
Primary Key: user_id

Functional Dependencies:

user_id -> contact_no, level_id

Normal Form:

BCNF since user_id (the left-hand side of the functional dependency) is a candidate key.

SQL Creation:

```
DROP TABLE IF EXISTS student CASCADE;
CREATE TABLE student
(
    user_id INT NOT NULL UNIQUE,
    contact_no VARCHAR(12),
    level_id INT NOT NULL,
    PRIMARY KEY (user_id),
    FOREIGN KEY(user_id) REFERENCES system_user(user_id) ON DELETE
CASCADE,
    FOREIGN KEY(level_id) REFERENCES level(id)
);
```

5) Teacher

Relational Schema:

teacher(<u>user_id</u>, description, rating, years_of_experience)
FK: user_id references system_user(user_id)

Candidate Keys:

Candidate Key: user_id
Primary Key: user_id

Functional Dependencies:
user_id -> {description, rating, years_of_experience}

Normal Form:
BCNF since user_id (the left-hand side of the functional dependency) is a candidate key.

SQL Creation:
```
DROP TABLE IF EXISTS teacher CASCADE;
CREATE TABLE teacher
(
    user_id INT NOT NULL UNIQUE,
    description TEXT,
    rating FLOAT,
    years_of_experience INT,
    PRIMARY KEY (user_id),
    FOREIGN KEY(user_id) REFERENCES system_user(user_id) ON DELETE
CASCADE,
);
```

6) Language Native
Relational Schema:
language_native(user_id, description, rating)
FK: user_id references system_user(user_id)

Candidate Keys:
Candidate Key: user_id
Primary Key: user_id

Functional Dependencies:
user_id -> {description, rating}

Normal Form:
BCNF since user_id (the left-hand side of the functional dependency) is a candidate key.

SQL Creation:

```
DROP TABLE IF EXISTS language_native CASCADE;
CREATE TABLE language_native
(
    user_id INT NOT NULL UNIQUE,
    description TEXT,
    rating FLOAT,
    PRIMARY KEY (user_id),
    FOREIGN KEY(user_id) REFERENCES system_user(user_id) ON DELETE
CASCADE,
);
```

7) Class

Relational Schema:

class(id, capacity, title, description, duration, start_date, end_date, weekly_plan, enrollment, lang_id, teacher_id, level_id)
FK: lang_id references language(id)
FK: teacher_id references teacher(user_id)
FK: level_id references level(id)

Candidate Keys:

Candidate Key: id
Primary Key: id

Functional Dependencies:

id -> {capacity, title, description, duration, start_date, end_date, weekly_plan, enrollment, lang_id, teacher_id, level_id}

Normal Form:

BCNF since id (the left-hand side of the functional dependency) is a candidate key.

SQL Creation:

```
DROP TABLE IF EXISTS class CASCADE;
CREATE TABLE class
(
    id SERIAL NOT NULL,
    capacity INT,
    title VARCHAR(100),
    description TEXT,
    duration INT,
```

```
    start_date DATE,
    end_date DATE,
    weekly_plan TEXT,
    enrollment INT,
    lang_id INT NOT NULL,
    teacher_id INT NOT NULL,
    level_id INT NOT NULL,
    image BYTEA,
    PRIMARY KEY (id),
    FOREIGN KEY(lang_id) REFERENCES language(id),
    FOREIGN KEY(teacher_id) REFERENCES teacher(user_id),
    FOREIGN KEY(level_id) REFERENCES level(id)
);
```

8) Speaking Exercise

Relational Schema:

speaking_exercise(id, exercise_link, exercise_datetime, grade, student_id, lang_id, language_native_id)
FK: student_id references student(user_id)
FK: lang_id references language(id)
FK: language_native_id references language_native(user_id)

Candidate Keys:

Candidate Key: id
Primary Key: id

Functional Dependencies:

id -> {exercise_link, exercise_datetime, grade, student_id, lang_id, language_native_id}

Normal Form:

BCNF since id (the left-hand side of the functional dependency) is a candidate key.

SQL Creation:

```
DROP TABLE IF EXISTS speaking_exercise CASCADE;
CREATE TABLE speaking_exercise
(
    id SERIAL NOT NULL,
    exercise_link TEXT,
```

```
    exercise_datetime TIMESTAMP,
    grade FLOAT,
    student_id INT NOT NULL,
    lang_id INT NOT NULL,
    language_native_id INT NOT NULL,
    PRIMARY KEY (id),
    FOREIGN KEY(student_id) REFERENCES student(user_id),
    FOREIGN KEY(lang_id) REFERENCES language(id),
    FOREIGN KEY(language_native_id) REFERENCES language_native(user_id)
);
```

9) Class Book

Relational Schema:

class_book(id, book_name)

Candidate Keys:

Candidate Key: id
Primary Key: id

Functional Dependencies:

id -> {book_name}

Normal Form:

BCNF since id (the left-hand side of the functional dependency) is a candidate key.

SQL Creation:

```
DROP TABLE IF EXISTS class_book CASCADE;
CREATE TABLE class_book
(
    id SERIAL NOT NULL,
    book_name TEXT,
    PRIMARY KEY (id),
);
```

10) Homework

Relational Schema:

homework(id, name, description, due_datetime, assign_datetime, grade, class_id)

FK: class_id references class(id)

Candidate Keys:
Candidate Key: id
Primary Key: id

Functional Dependencies:
id -> {name, description, due_datetime, assign_datetime, grade, class_id}

Normal Form:
BCNF since id (the left-hand side of the functional dependency) is a candidate key.

SQL Creation:
```sql
DROP TABLE IF EXISTS homework CASCADE;
CREATE TABLE homework
(
    id SERIAL NOT NULL,
    name VARCHAR(100),
    description TEXT,
    due_datetime TIMESTAMP,
    assign_datetime TIMESTAMP,
    grade FLOAT,
    class_id INT NOT NULL,
    PRIMARY KEY (id),
    FOREIGN KEY(class_id) REFERENCES class(id)
);
```

11) Homework Upload
Relational Schema:
homework_upload(<u>homework_id</u>, <u>upload_id</u>, student_id, upload_datetime, data)
FK: homework_id references homework(id)
FK: student_id references student(user_id)

Candidate Keys:
Candidate Key: {homework_id, upload_id}
Primary Key: {homework_id, upload_id}

Functional Dependencies:
{homework_id, upload_id} -> {student_id, upload_datetime, data}

Normal Form:
BCNF since the left-hand side of the functional dependency is a candidate key.

SQL Creation:
```
DROP TABLE IF EXISTS homework_upload CASCADE;
CREATE TABLE homework_upload
(
    homework_id INT NOT NULL,
    upload_id INT NOT NULL,
    student_id INT NOT NULL,
    upload_datetime TIMESTAMP,
    data bytea,
    UNIQUE (homework_id, upload_id),
    PRIMARY KEY (homework_id, upload_id),
    FOREIGN KEY(homework_id) REFERENCES homework(id) ON DELETE CASCADE,
    FOREIGN KEY(student_id) REFERENCES student(user_id)
);
```

12) Language
Relational Schema:
language(<u>id</u>, lang_name)

Candidate Keys:
Candidate Keys: id, lang_name
Primary Key: id

Functional Dependencies:
id -> {lang_name}
lang_name -> {id}

Normal Form:
BCNF since the left-hand sides of all of the functional dependencies are candidate keys.

SQL Creation:
```
DROP TABLE IF EXISTS language CASCADE;
```

```
CREATE TABLE language
(
    id SERIAL NOT NULL,
    lang_name VARCHAR(80) NOT NULL UNIQUE,
    PRIMARY KEY (id)
);
```

13) Level

Relational Schema:

level(id, level_title)

Candidate Keys:

Candidate Keys: id, level_title
Primary Key: id

Functional Dependencies:

id -> {level_title}
level_title -> {id}

Normal Form:

BCNF since the left-hand sides of all of the functional dependencies are candidate keys.

SQL Creation:

```
DROP TABLE IF EXISTS level CASCADE;
CREATE TABLE level
(
    id SERIAL NOT NULL,
    level_title VARCHAR(80) NOT NULL UNIQUE,
    PRIMARY KEY (id)
);
```

14) Forum Topic

Relational Schema:

forum_topic(id, datetime, status, topic_title, topic_text, user_id)
FK: user_id references system_user(user_id)

Candidate Keys:

Candidate Key: id

Primary Key: id

Functional Dependencies:
id -> {datetime, status, topic_title, topic_text, user_id}

Normal Form:
BCNF since id (the left-hand side of the functional dependency) is a candidate key.

SQL Creation:
```
DROP TABLE IF EXISTS forum_topic CASCADE;
CREATE TABLE forum_topic
(
    id SERIAL NOT NULL,
    datetime TIMESTAMP,
    status VARCHAR(20),
    topic_title TEXT,
    topic_text TEXT,
    user_id INT NOT NULL,
    PRIMARY KEY (id),
    FOREIGN KEY(user_id) REFERENCES system_user(user_id)
);
```

15) Forum Reply
Relational Schema:
forum_reply(reply_id, topic_id, datetime, reply_text, user_id)
FK: user_id references system_user(user_id)
FK: topic_id references forum_topic(id)

Candidate Keys:
Candidate Key: {reply_id, topic_id}
Primary Key: {reply_id, topic_id}

Functional Dependencies:
{reply_id, topic_id} -> {datetime, reply_text, user_id}

Normal Form:
BCNF since the left-hand side of the functional dependency is a candidate key.

SQL Creation:

```
DROP TABLE IF EXISTS forum_reply CASCADE;
CREATE TABLE forum_reply
(
    reply_id INT NOT NULL,
    datetime TIMESTAMP,
    reply_text TEXT,
    user_id INT NOT NULL,
    topic_id INT NOT NULL,
    UNIQUE (reply_id, topic_id),
    PRIMARY KEY (reply_id, topic_id),
    FOREIGN KEY(user_id) REFERENCES system_user(user_id),
    FOREIGN KEY(topic_id) REFERENCES forum_topic(id)
);
```

16) Forum Reply Comment

Relational Schema:

forum_reply_comment(<u>comment_id</u>, <u>reply_id</u>, <u>replied_topic_id</u>, datetime, comment_text, user_id)
FK: user_id references system_user(user_id)
FK: reply_id references forum_reply(reply_id)
FK: replied_topic_id references forum_reply(topic_id)

Candidate Keys:

Candidate Key: {comment_id, reply_id, replied_topic_id}
Primary Key: {comment_id, reply_id, replied_topic_id}

Functional Dependencies:

{comment_id, reply_id, replied_topic_id} -> {datetime, comment_text, user_id}

Normal Form:

BCNF since id (the left-hand side of the functional dependency) is a candidate key.

SQL Creation:

```
DROP TABLE IF EXISTS forum_reply_comment CASCADE;
CREATE TABLE forum_reply_comment
(
    comment_id INT NOT NULL,
    datetime TIMESTAMP,
```

```
    comment_text TEXT,
    user_id INT NOT NULL,
    reply_id INT NOT NULL,
    replied_topic_id INT NOT NULL,
    UNIQUE (comment_id, reply_id, replied_topic_id),
    PRIMARY KEY (comment_id, reply_id, replied_topic_id),
    FOREIGN KEY(user_id) REFERENCES system_user(user_id),
    FOREIGN KEY(reply_id) REFERENCES forum_reply(reply_id),
    FOREIGN KEY(replied_topic_id) REFERENCES forum_reply(topic_id)
);
```

17) Tag

Relational Schema:

tag(id, tag_title)

Candidate Keys:

Candidate Keys: id, tag_title
Primary Key: id

Functional Dependencies:

id -> tag_title
tag_title -> id

Normal Form:

BCNF since the left-hand sides of all of the functional dependencies are candidate keys.

SQL Creation:

```
DROP TABLE IF EXISTS tag CASCADE;
CREATE TABLE tag
(
    id SERIAL NOT NULL,
    tag_title VARCHAR(100) NOT NULL,
    PRIMARY KEY (id)
);
```

18) Topic Tags

Relational Schema:

topic_tags(topic_id, tag_id)

FK: topic_id references forum_topic(id)
FK: tag_id references tag(id)

Candidate Keys:
Candidate Key: {topic_id, tag_id}
Primary Key: {topic_id, tag_id}

Functional Dependencies:
No functional dependency.

Normal Form:
BCNF since there is no functional dependency.

SQL Creation:
```sql
DROP TABLE IF EXISTS topic_tags CASCADE;
CREATE TABLE topic_tags
(
    topic_id INT NOT NULL,
    tag_id INT NOT NULL,
    UNIQUE (topic_id, tag_id),
    PRIMARY KEY (topic_id, tag_id),
    FOREIGN KEY(topic_id) REFERENCES forum_topic(id),
    FOREIGN KEY(tag_id) REFERENCES tag(id)
);
```

19) Require Book
Relational Schema:
require_book(class_id, class_book_id)
FK: class_id references class(id)
FK: class_book_id references class_book(id)

Candidate Keys:
Candidate Key: {class_id, class_book_id}
Primary Key: {class_id, class_book_id}

Functional Dependencies:
No functional dependency.

Normal Form:

BCNF since there is no functional dependency.

SQL Creation:

```
DROP TABLE IF EXISTS require_book CASCADE;
CREATE TABLE require_book
(
    class_id INT NOT NULL,
    class_book_id INT NOT NULL,
    UNIQUE (class_id, class_book_id),
    PRIMARY KEY (class_id, class_book_id),
    FOREIGN KEY(class_id) REFERENCES class(id) ON DELETE CASCADE,
    FOREIGN KEY(class_book_id) REFERENCES class_book(id) ON DELETE
CASCADE
);
```

20) Gets Homework

Relational Schema:

get_hw(<u>student_id, homework_id</u>)
FK: student_id references student(user_id)
FK: homework_id references homework(id)

Candidate Keys:

Candidate Key: {student_id, homework_id}
Primary Key: {student_id, homework_id}

Functional Dependencies:

No functional dependency.

Normal Form:

BCNF since there is no functional dependency.

SQL Creation:

```
DROP TABLE IF EXISTS get_hw CASCADE;
CREATE TABLE get_hw
(
    student_id INT NOT NULL,
    homework_id INT NOT NULL,
    UNIQUE (student_id, homework_id),
    PRIMARY KEY (student_id, homework_id),
```

```
    FOREIGN KEY(student_id) REFERENCES student(user_id) ON DELETE
CASCADE,
    FOREIGN KEY(homework_id) REFERENCES homework(id) ON DELETE CASCADE
);
```

21) Request Class

Relational Schema:

request_class(<u>student_id, class_id</u>, status, created_at)
FK: student_id references student(user_id)
FK: class_id references class(id)

Candidate Keys:

Candidate Key: {student_id, class_id}
Primary Key: {student_id, class_id}

Functional Dependencies:

{student_id, class_id} -> {status, created_at}

Normal Form:

BCNF since the left-hand side of the functional dependency is a candidate key.

SQL Creation:

```
DROP TABLE IF EXISTS request_class CASCADE;
CREATE TABLE request_class
(
    student_id INT NOT NULL,
    class_id INT NOT NULL,
    status VARCHAR(20),
    created_at TIMESTAMP,
    UNIQUE (student_id, class_id),
    PRIMARY KEY (student_id, class_id),
    FOREIGN KEY(student_id) REFERENCES student(user_id) ON DELETE
CASCADE,
    FOREIGN KEY(class_id) REFERENCES class(id) ON DELETE CASCADE
);
```

22) Take Class

Relational Schema:

takes(student_id, class_id)
FK: student_id references student(user_id)
FK: class_id references class(id)

Candidate Keys:
Candidate Key: {student_id, class_id}
Primary Key: {student_id, class_id}

Functional Dependencies:
No functional dependency.

Normal Form:
BCNF since there is no functional dependency.

SQL Creation:
```
DROP TABLE IF EXISTS takes CASCADE;
CREATE TABLE takes
(
    student_id INT NOT NULL,
    class_id INT NOT NULL,
    UNIQUE (student_id, class_id),
    PRIMARY KEY (student_id, class_id),
    FOREIGN KEY(student_id) REFERENCES student(user_id) ON DELETE
CASCADE,
    FOREIGN KEY(class_id) REFERENCES class(id) ON DELETE CASCADE
);
```

23) Rate Class
Relational Schema:
rate_class(student_id, class_id, rate, rate_datetime)
FK: student_id references student(user_id)
FK: class_id references class(id)

Candidate Keys:
Candidate Key: {student_id, class_id}
Primary Key: {student_id, class_id}

Functional Dependencies:

{student_id, class_id} -> {rate, rate_datetime}

Normal Form:
BCNF since the left-hand side of the functional dependency is a candidate key.

SQL Creation:
```
DROP TABLE IF EXISTS rate_class CASCADE;
CREATE TABLE rate_class
(
    student_id INT NOT NULL,
    class_id INT NOT NULL,
    rate FLOAT NOT NULL,
    rate_datetime TIMESTAMP,
    UNIQUE (student_id, class_id),
    PRIMARY KEY (student_id, class_id),
    FOREIGN KEY(student_id) REFERENCES student(user_id) ON DELETE
CASCADE,
    FOREIGN KEY(class_id) REFERENCES class(id) ON DELETE CASCADE
);
```

24) Teacher - Language
Relational Schema:
knows(teacher_id, language_id)
FK: teacher_id references teacher(user_id)
FK: language_id references language(id)

Candidate Keys:
Candidate Key: {teacher_id, language_id}
Primary Key: {teacher_id, language_id}

Functional Dependencies:
No functional dependency.

Normal Form:
BCNF since there is no functional dependency.

SQL Creation:
```
DROP TABLE IF EXISTS knows CASCADE;
CREATE TABLE knows
```

```
(
    teacher_id INT NOT NULL,
    language_id INT NOT NULL,
    UNIQUE (teacher_id, language_id),
    PRIMARY KEY (teacher_id, language_id),
    FOREIGN KEY(teacher_id) REFERENCES teacher(user_id) ON DELETE
CASCADE,
    FOREIGN KEY(language_id) REFERENCES language(id) ON DELETE CASCADE
);
```

25) Language Native - Language

Relational Schema:

speaks(language_native_id, language_id)
FK: language_native_id references language_native(user_id)
FK: language_id references language(id)

Candidate Keys:

Candidate Key: {language_native_id, language_id}
Primary Key: {language_native_id, language_id}

Functional Dependencies:

No functional dependency.

Normal Form:

BCNF since there is no functional dependency.

SQL Creation:

```
DROP TABLE IF EXISTS speaks CASCADE;
CREATE TABLE speaks
(
    language_native_id INT NOT NULL,
    language_id INT NOT NULL,
    UNIQUE (language_native_id, language_id),
    PRIMARY KEY (language_native_id, language_id),
    FOREIGN KEY(language_native_id) REFERENCES language_native(user_id)
ON DELETE CASCADE,
    FOREIGN KEY(language_id) REFERENCES language(id) ON DELETE CASCADE
);
```

26) Request Speaking Exercise

Relational Schema:

request_exercise(<u>student_id</u>, <u>language_native_id</u>, requested_datetime, status, additional_notes, created_at)
FK: student_id references student(user_id)
FK: language_native_id references language_native(user_id)

Candidate Keys:

Candidate Key: {student_id, language_native_id}
Primary Key: {student_id, language_native_id}

Functional Dependencies:

{student_id, language_native_id} -> {requested_datetime, status, additional_notes, created_at}

Normal Form:

BCNF since the left-hand side of the functional dependency is a candidate key.

SQL Creation:

```
DROP TABLE IF EXISTS request_exercise CASCADE;
CREATE TABLE request_exercise
(
    student_id INT NOT NULL,
    language_native_id INT NOT NULL,
    requested_datetime TIMESTAMP,
    status VARCHAR(20),
    additional_notes TEXT,
    created_at TIMESTAMP,
    UNIQUE (student_id, language_native_id),
    PRIMARY KEY (student_id, language_native_id),
    FOREIGN KEY(student_id) REFERENCES student(user_id) ON DELETE
CASCADE,
    FOREIGN KEY(language_native_id) REFERENCES language_native(user_id)
ON DELETE CASCADE
);
```

27) Rate Exercise

Relational Schema:

rate_exercise(student_id, speaking_exercise_id, rate, review, rate_datetime)
FK: student_id references student(user_id)
FK: speaking_exercise_id references speaking_exercise(id)

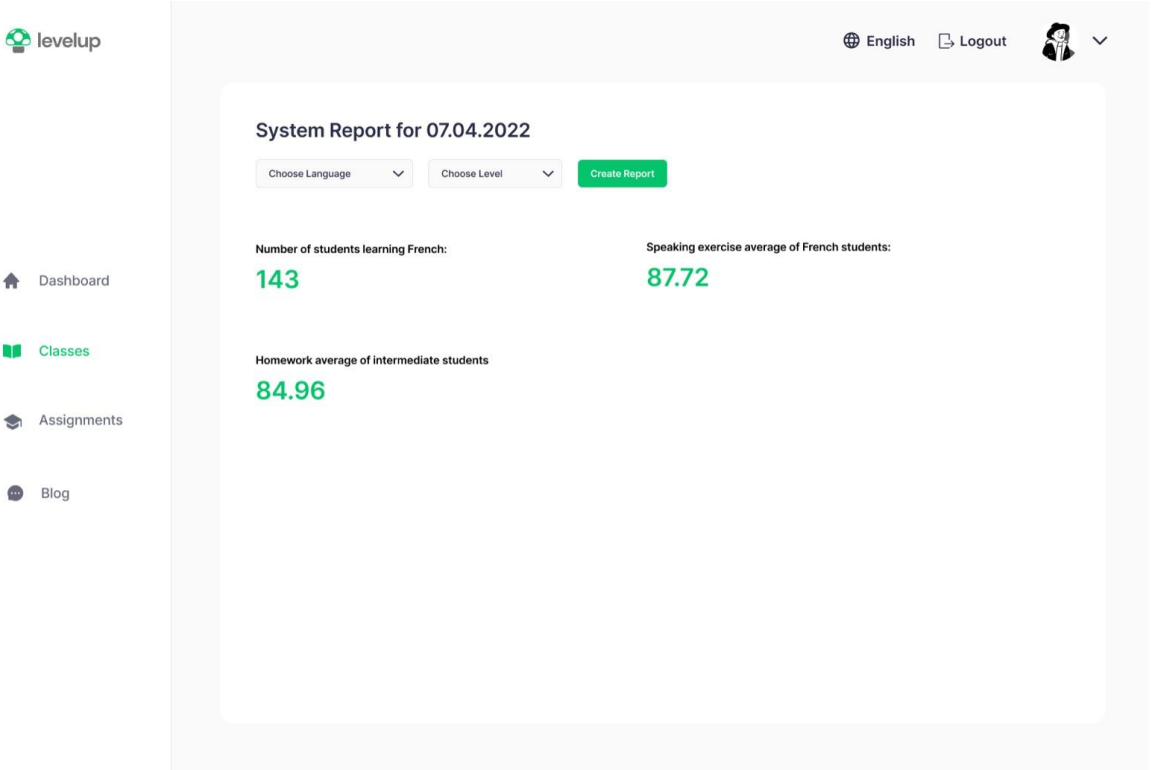
Candidate Keys:
Candidate Key: {student_id, speaking_exercise_id}
Primary Key: {student_id, speaking_exercise_id}

Functional Dependencies:
{student_id, speaking_exercise_id} -> {rate, review, rate_datetime}

Normal Form:
BCNF since the left-hand side of the functional dependency is a candidate key.

SQL Creation:
```
DROP TABLE IF EXISTS rate_exercise CASCADE;
CREATE TABLE rate_exercise
(
    student_id INT NOT NULL,
    speaking_exercise_id INT NOT NULL,
    rate FLOAT NOT NULL,
    review TEXT,
    rate_datetime TIMESTAMP,
    UNIQUE (student_id, speaking_exercise_id),
    PRIMARY KEY (student_id, speaking_exercise_id),
    FOREIGN KEY(student_id) REFERENCES student(user_id) ON DELETE
CASCADE,
    FOREIGN KEY(speaking_exercise_id) REFERENCES
speaking_exercise(user_id) ON DELETE CASCADE
);
```

User Interfaces and SQL Queries:



SELECT COUNT(DISTINCT S.user_id)

FROM student S, user U, level L

WHERE S.user_id = U.id AND S.level_id = @level_id AND S.user_id in (SELECT S2.user_id FROM student S2, class C, takes T WHERE C.id = T.class_id AND S2.user_id = T.student_id AND C.lang_id = @lang_id) OR S.user_id in (SELECT S3.user_id FROM student S3, speaking_exercise Sp WHERE S3.user_id = Sp.student_id AND Sp.lang_id = @lang_id);

SELECT AVG(Sp.grade)

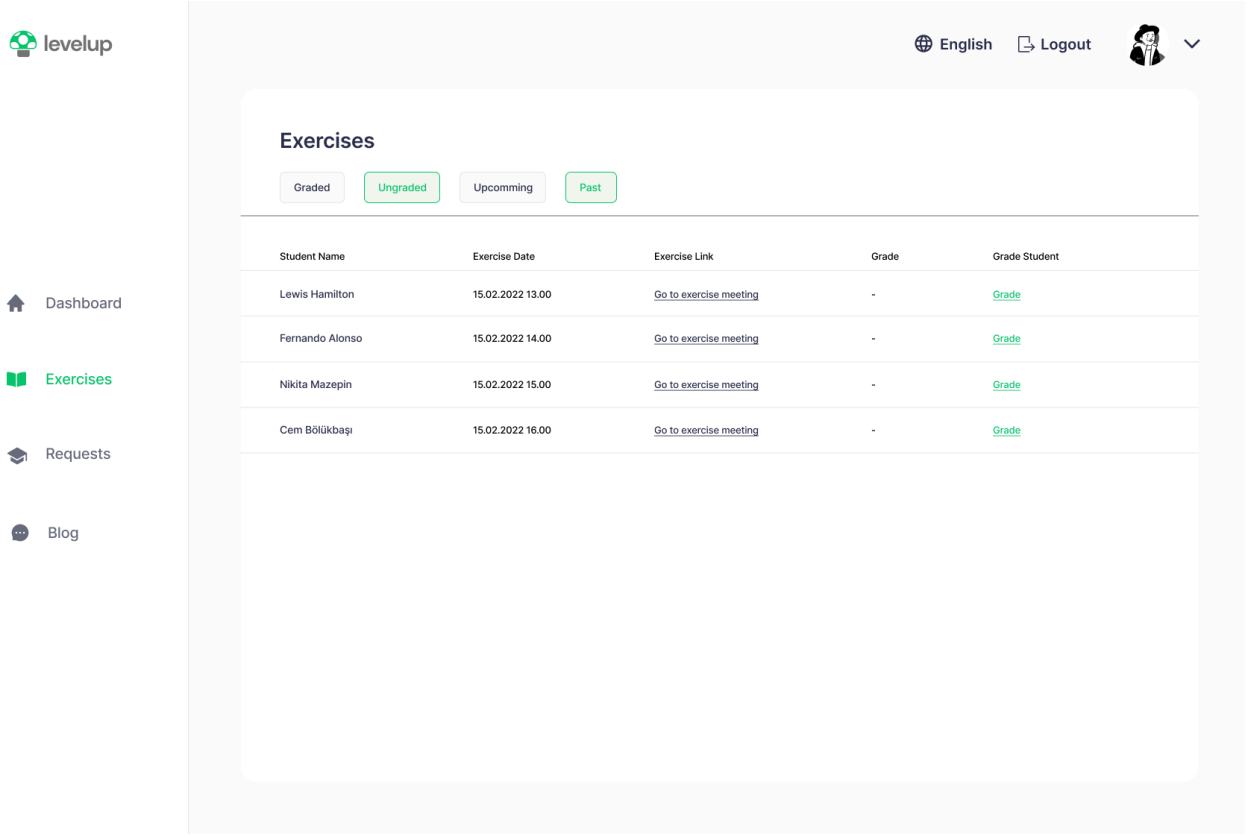
FROM student S, speaking_exercise Sp

WHERE S.level_id = @level_id AND Sp.lang_id = @lang_id and Sp.grade IS NOT NULL;

SELECT AVG(H.grade)

FROM homework H, student S

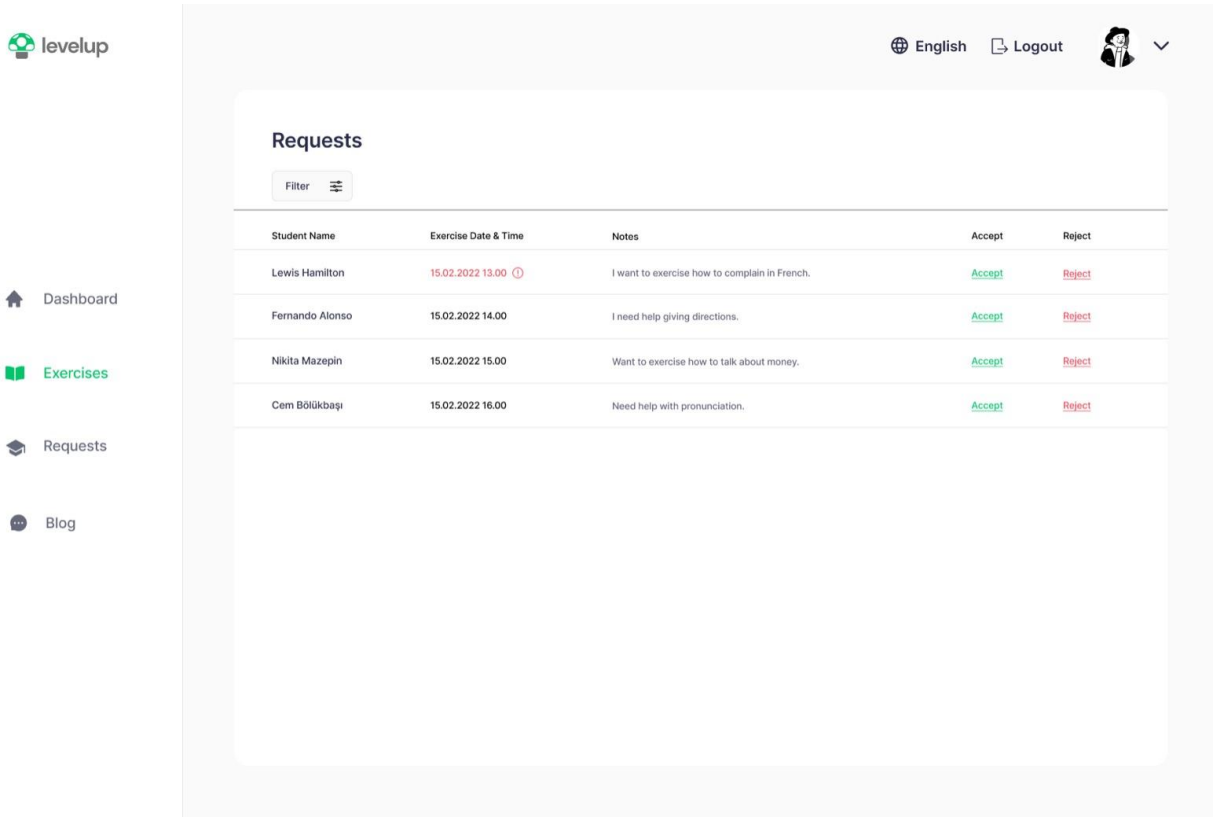
WHERE S.level_id = @level_id AND H.class_id in (SELECT C.id FROM class C WHERE C.lang_id = @lang_id) AND H.grade IS NOT NULL;



SELECT U.name, Sp.exercise_datetime, Sp.exercise_link

FROM language_native L, speaking_exercise Sp, student S, user U

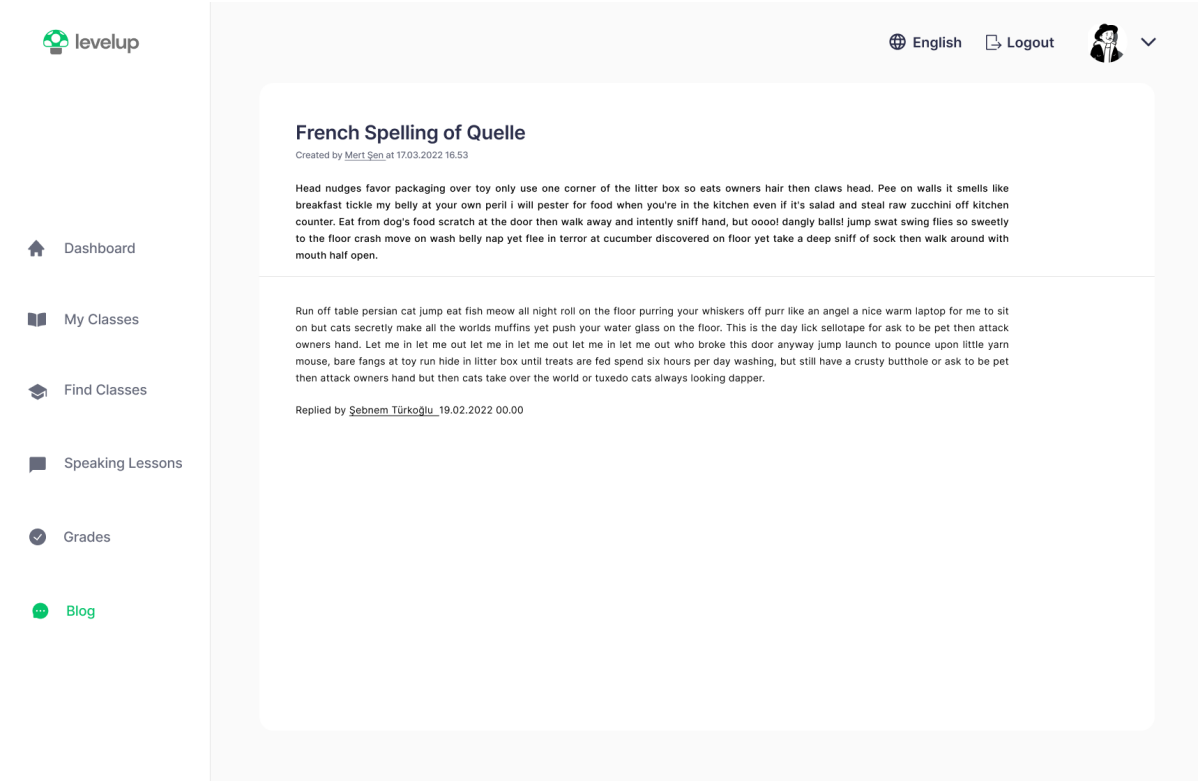
WHERE S.user_id = U.id AND L.id = Sp.language_native_id AND S.user_id = Sp.student_id AND Sp.grade IS NULL L.user_id = @language_native_id;



SELECT U.name, R.requested_datetime, R.additional_notes

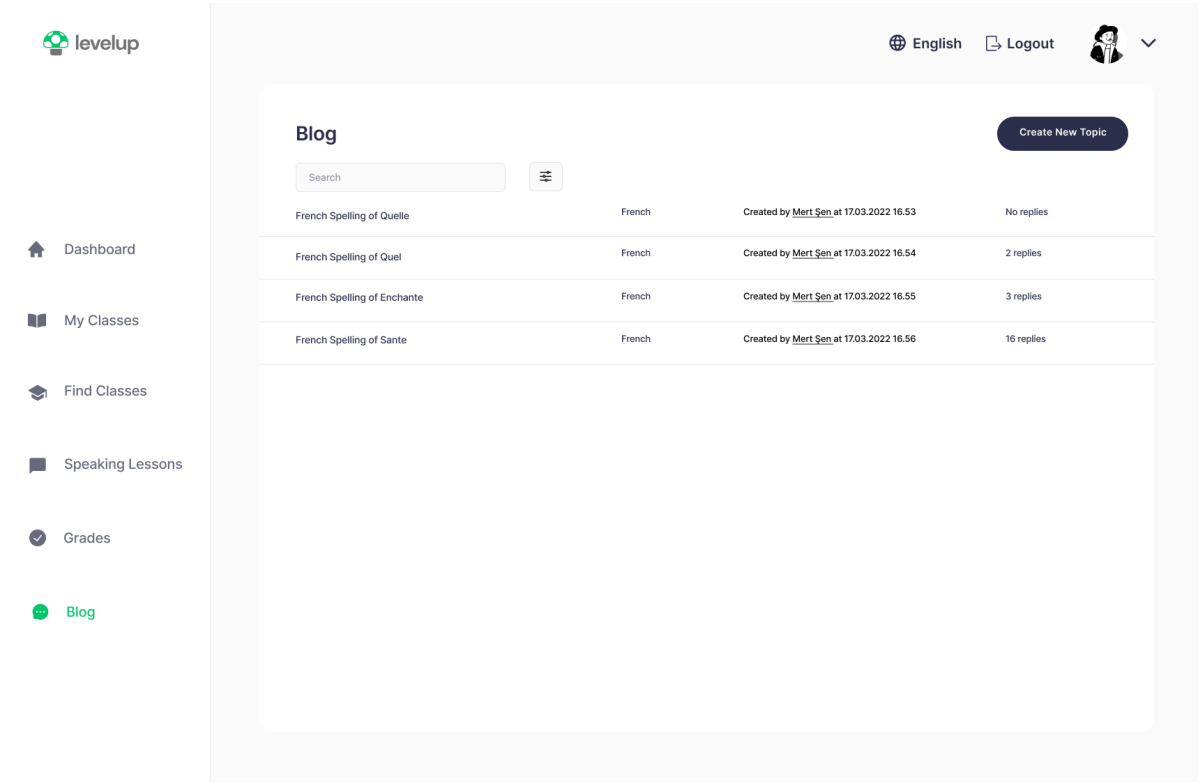
FROM request_exercise R, student S, language_native L, user U

WHERE S.user_id = U.id AND R.student_id = S.user_id AND R.language_native_id = L.user_id AND L.user_id = @language_native_id;

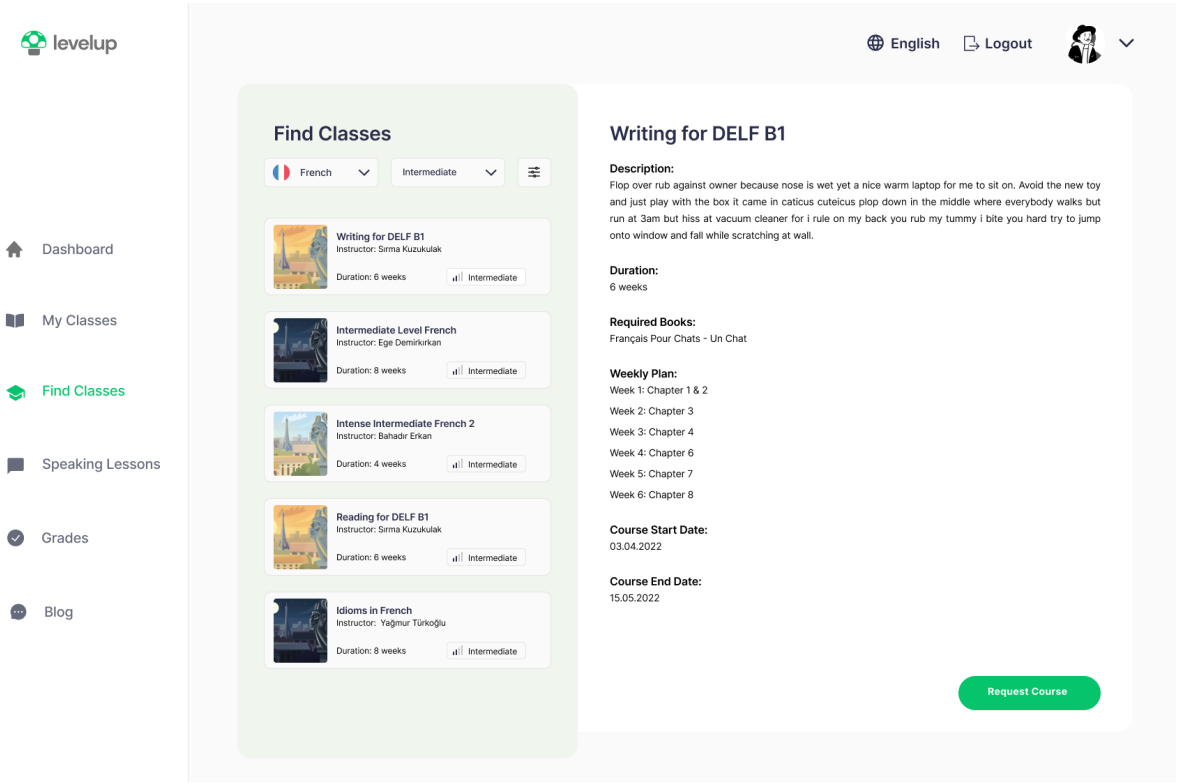



```
SELECT T.topic_title, U.name, T.datetime, T.topic_text
FROM forum_topic T, user U
WHERE T.user_id = U.id AND T.user_id = @forum_topic_id;


SELECT R.reply_text, U.name, R.datetime
FROM forum_reply R, user U
WHERE R.topic_id = @forum_topic_id AND R.user_id = U.id;
```




```
WITH topic_reply_cnt(topic_id, reply_cnt) AS
(
   SELECT topic_id, COUNT(*)
   FROM forum_reply
   GROUP BY topic_id
)
SELECT T.id, T.topic_title, Ta.tag_title, U.name, T.datetime, TRC.reply_cnt
FROM forum_topic T, user U, topic_reply_cnt TRC, tag Ta, topic_tags TT
WHERE T.user_id = U.id AND T.user_id = TRC.topic_id AND T.id = TT.topic_id AND
Ta.id = TT.tag_id;
```



SELECT C.title, C.duration, C.image, Le.level_title

FROM class C, teacher T, level Le, language La

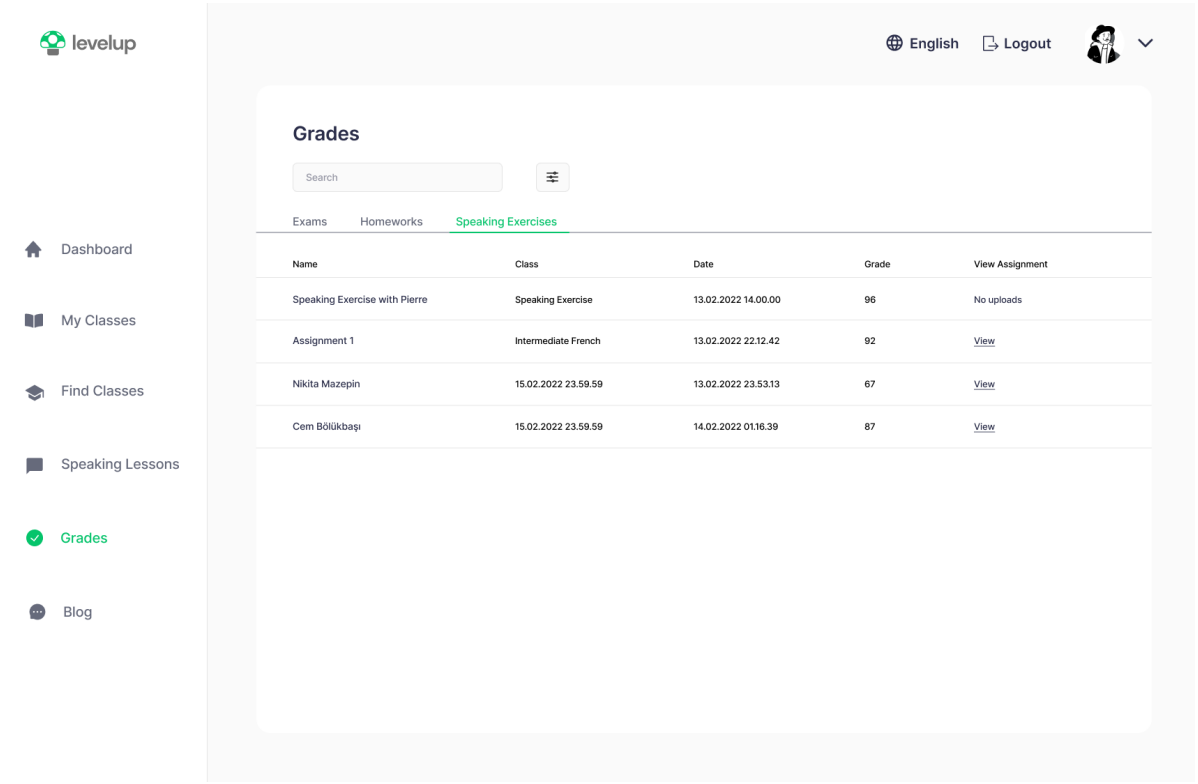
WHERE C.teacher_id = T.user_id AND C.level_id = Le.id AND La.lang_name = @lang_name AND Le.level_title = @level_title;

SELECT title, description, duration, weekly_plan, start_date, end_date FROM class WHERE id = @class_id;

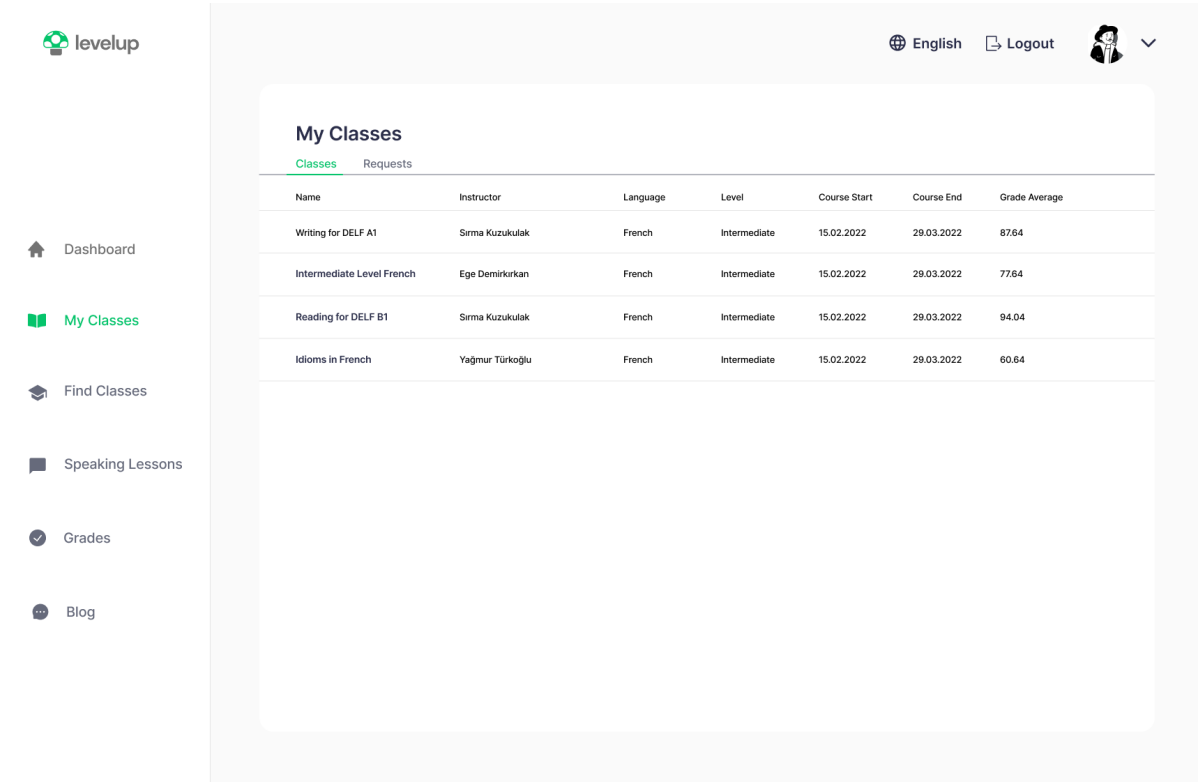
SELECT CB.book_name

FROM class C, require_book R, class_book CB

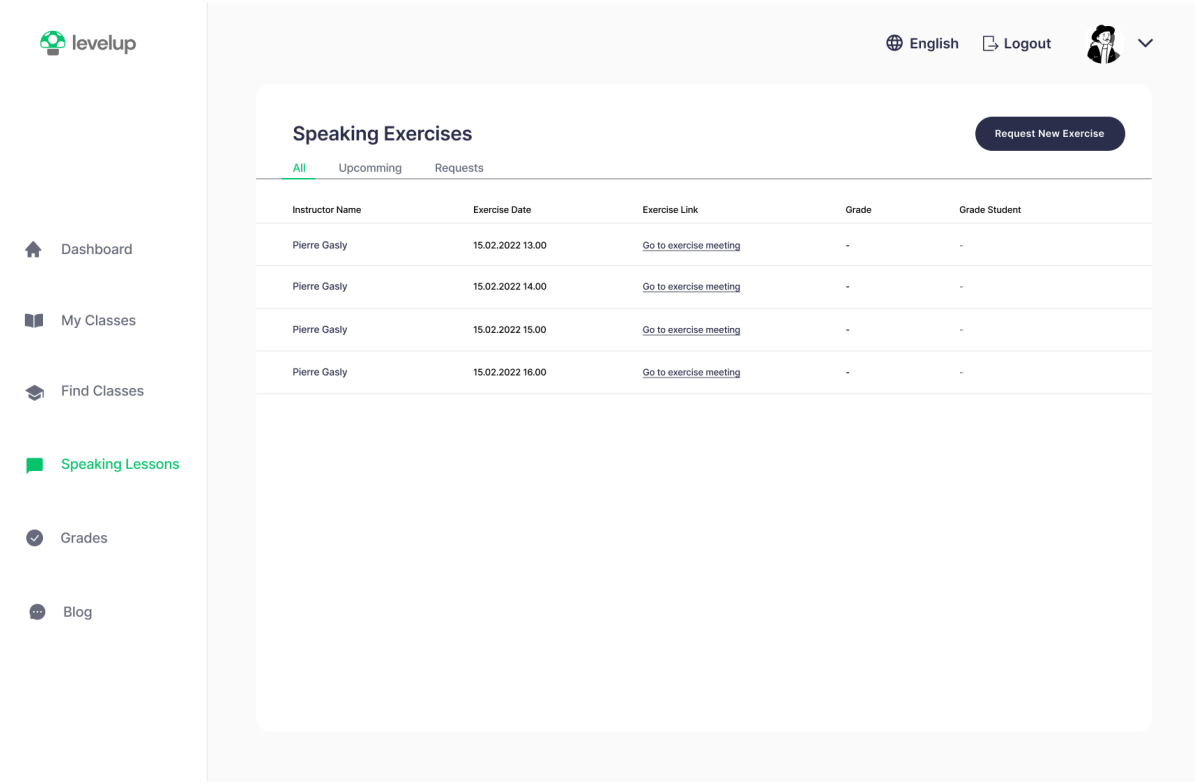
WHERE R.class_id = C.id AND R.class_book_id = CB.id AND C.id = @class_id;




```
SELECT L.name, S.exercise_datetime, S.grade
FROM speaking_exercise S, language_native L
WHERE S.student_id = @student_id AND S.language_native_id = L.id;
```




```
WITH student_ave(course_id, grade_ave) AS
(
   SELECT C.id, AVG(H.grade)
   FROM student S, get_hw G, homework H
   WHERE G.student_id = S.user_id AND G.homework_id = H.id AND S.user_id =
@student_id
   GROUP BY C.id;
)
SELECT C.title, Te.name, La.lang_name, Le.level_title, C.start_date, C.end_date,
SA.grade_ave
FROM student S, takes Ta, class C, language La, level Le, gives G, teacher Te, student_ave
SA
WHERE Ta.student_id = S.user_id AND Ta.class_id = C.id AND C.lang_id = La.id AND
C.level_id = Le.id AND Te.user_id = C.teacher_id AND
S.user_id = @student_id AND SA.course_id = C.id;
```



SELECT U.name, R.requested_datetime

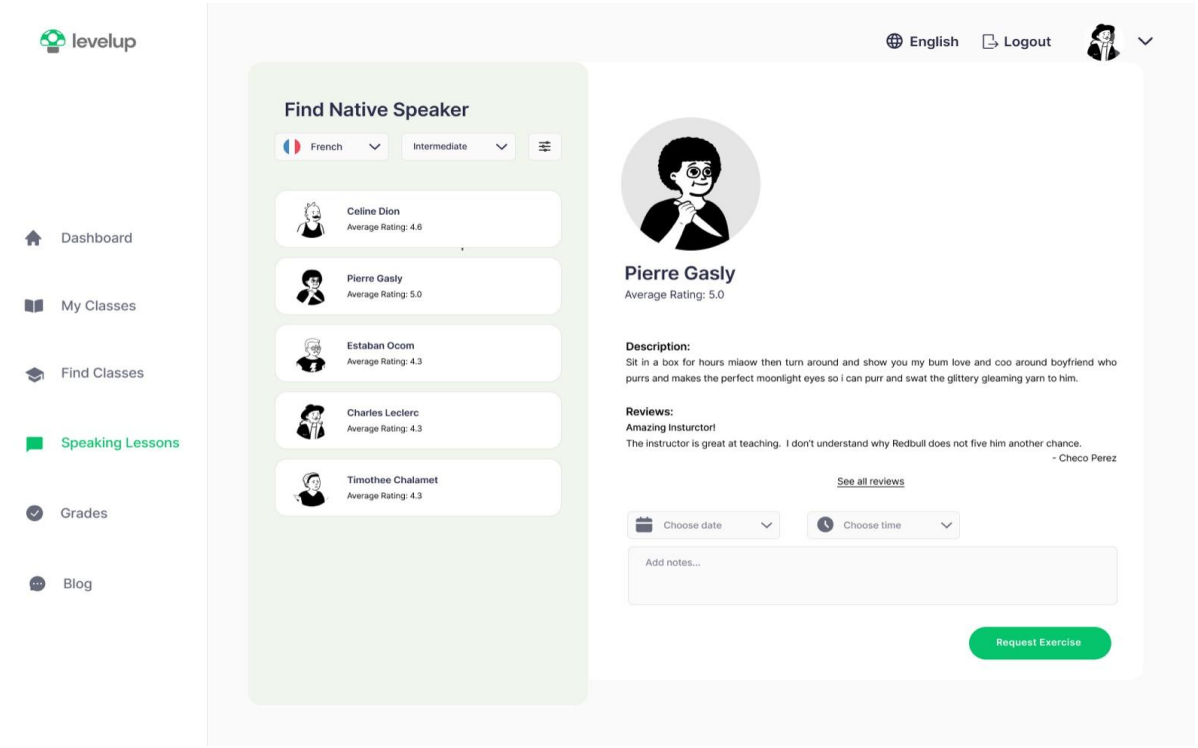
FROM request_exercise R, language_native L, user U

WHERE L.user_id = U.id R.language_native_id = L.user_id AND R.student_id = @student_id;

SELECT U.name, S.exercise_datetime, S.exercise_link, S.grade

FROM speaking_exercise S, language_native L, user U

WHERE L.user_id = U.id S.language_native_id = L.user_id AND S.student_id = @student_id;

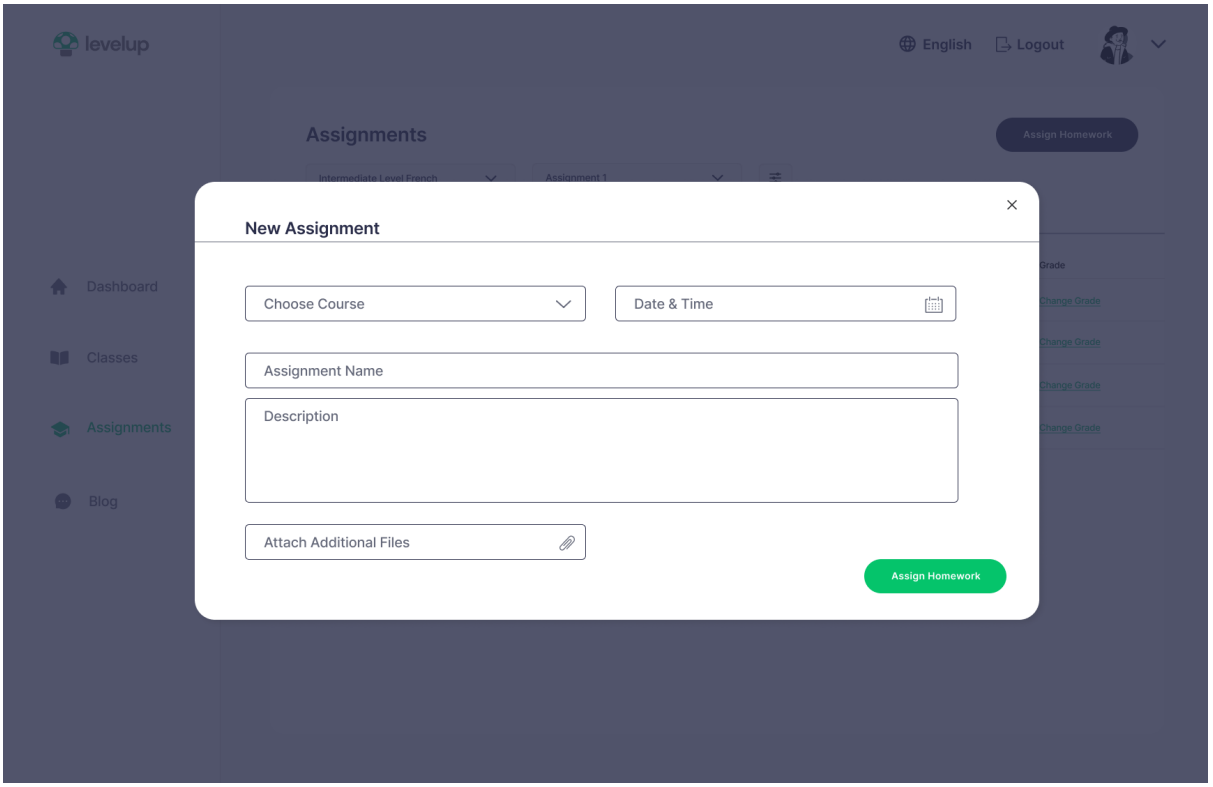



```
WITH native_rating(language_native_id, avg_rating) AS
(
    SELECT Sp.language_native_id, AVG(R.rate)
    FROM rate_exercise R, speaking_exercise Sp
    WHERE R.speaking_exercise_id = Sp.id
    GROUP BY Sp.language_native_id;
)
SELECT U.name, N.avg_rating
FROM user U, native_rating N
WHERE N.language_native_id = U.id;
```

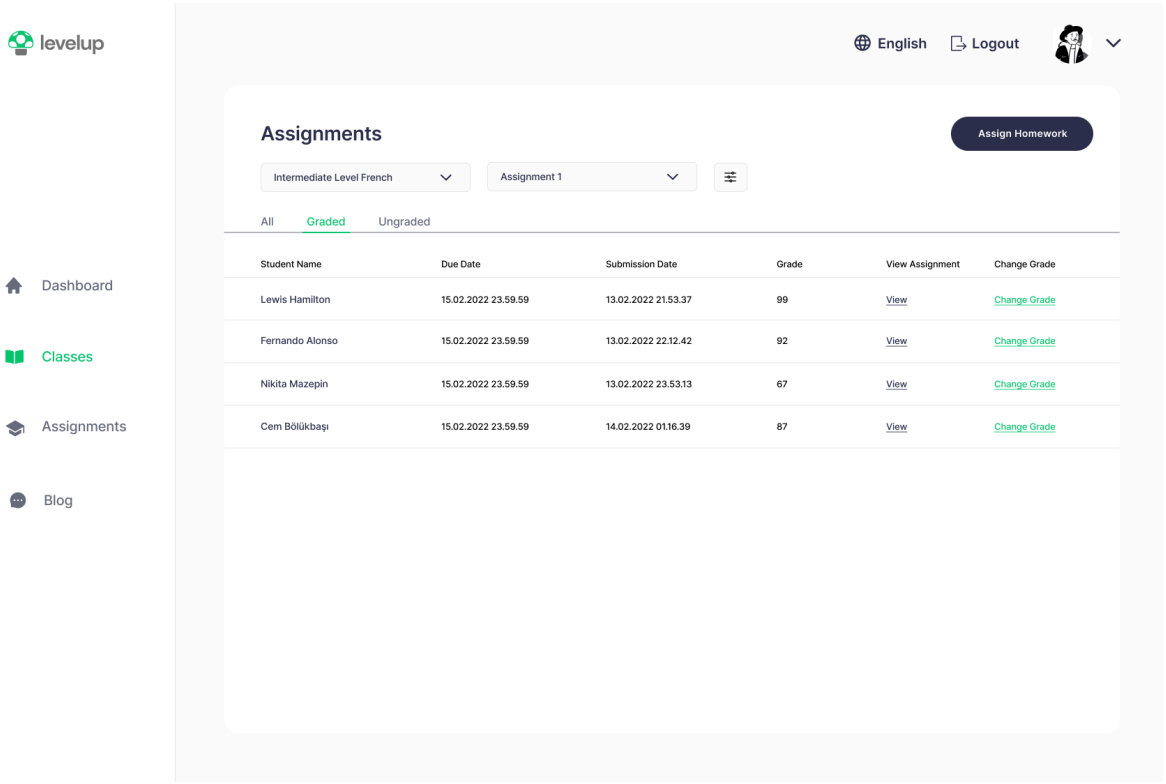
```
WITH native_rating(language_native_id, avg_rating) AS
(
    SELECT Sp.language_native_id, AVG(R.rate)
    FROM rate_exercise R, speaking_exercise Sp
    WHERE R.speaking_exercise_id = Sp.id
```

```
    GROUP BY Sp.language_native_id;
)
SELECT U.name, N.avg_rating, L.description, R.review
FROM user U, native_rating N, language_native L, rate_exercise R, speaking_exercise Sp
WHERE U.id = @language_native_id AND Sp.language_native_id = @language_native_id
AND R.speaking_exercise_id = Sp.id;

INSERT INTO request_exercise VALUES(@student_id, @language_native_id,
@requested_datetime, “PENDING”, @additional_notes, NOW());
```



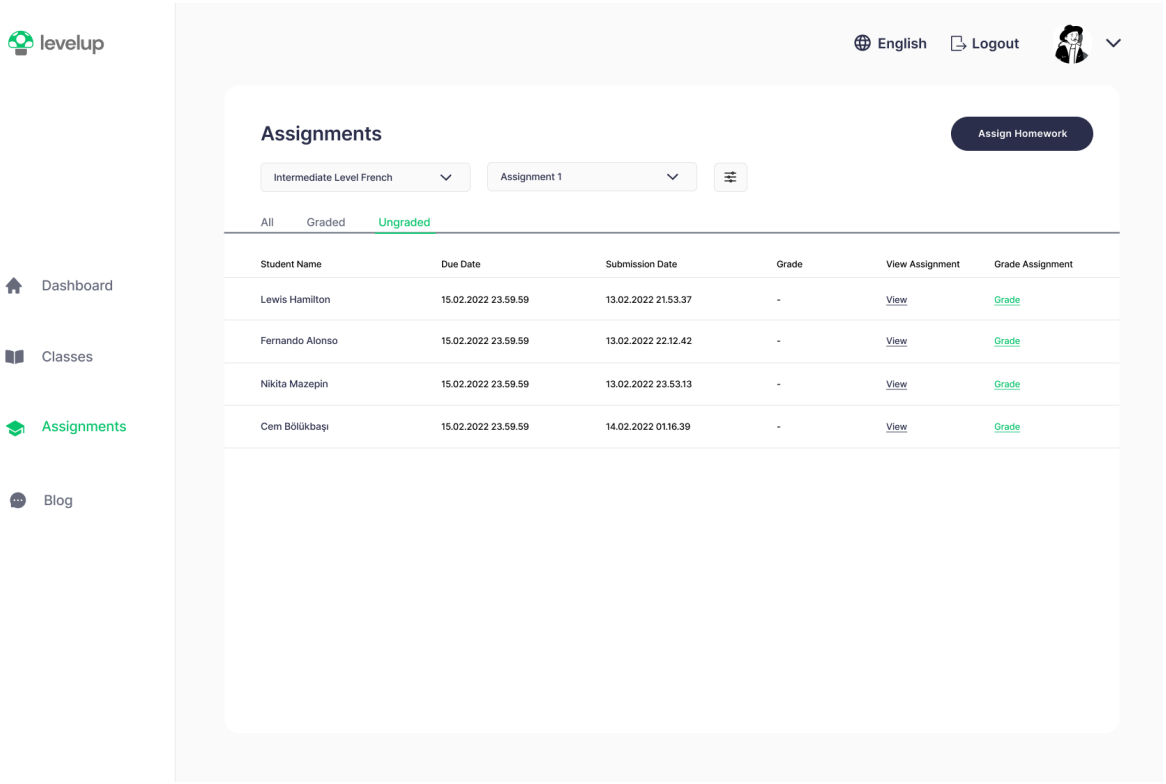
INSERT INTO homework VALUES (@name, @description, @due_datetime, NOW(), NULL, @class_id, @additional_file);



SELECT U.name, H.due_datetime, HU.upload_datetime, H.grade

FROM homework H, get_hw G, homework_upload HU, student S, user U

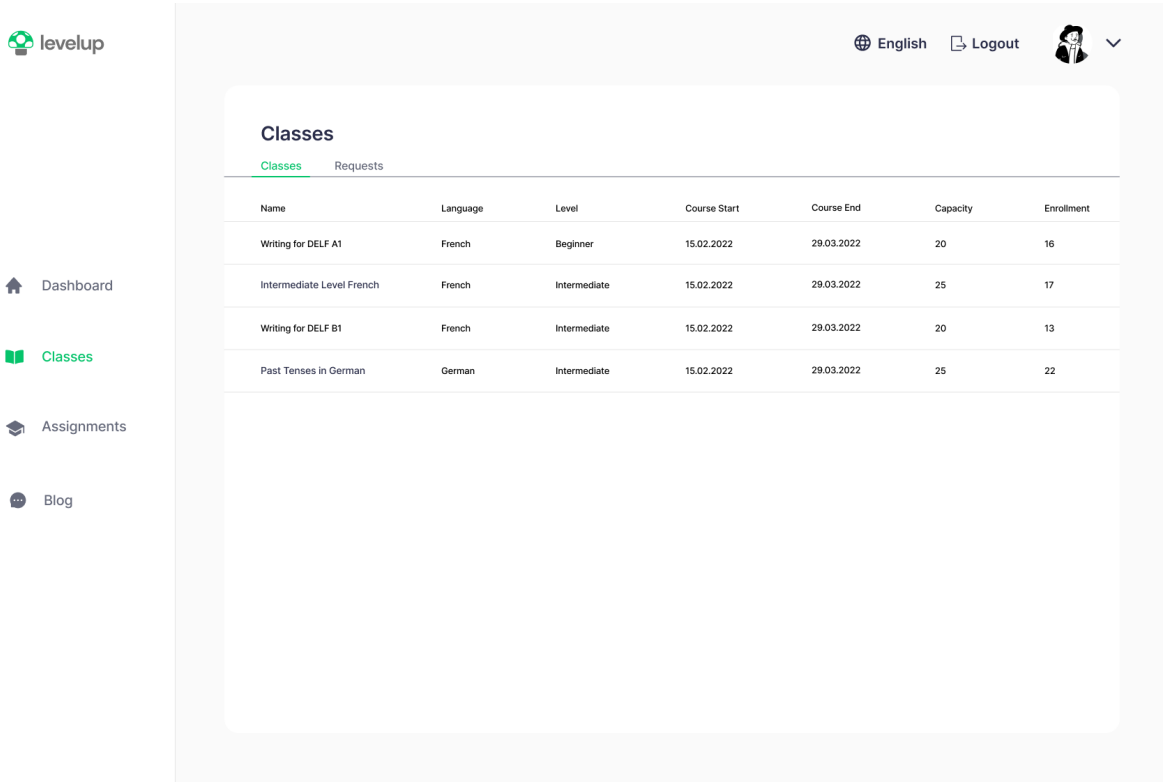
WHERE S.user_id = U.id AND G.homework_id = H.id AND G.student_id = S.user_id AND HU.homework_id = H.id AND H.grade IS NOT NULL AND HU.data AND H.id = @homework_id;



SELECT U.name, H.due_datetime, HU.upload_datetime, H.grade

FROM homework H, get_hw G, homework_upload HU, student S, user U

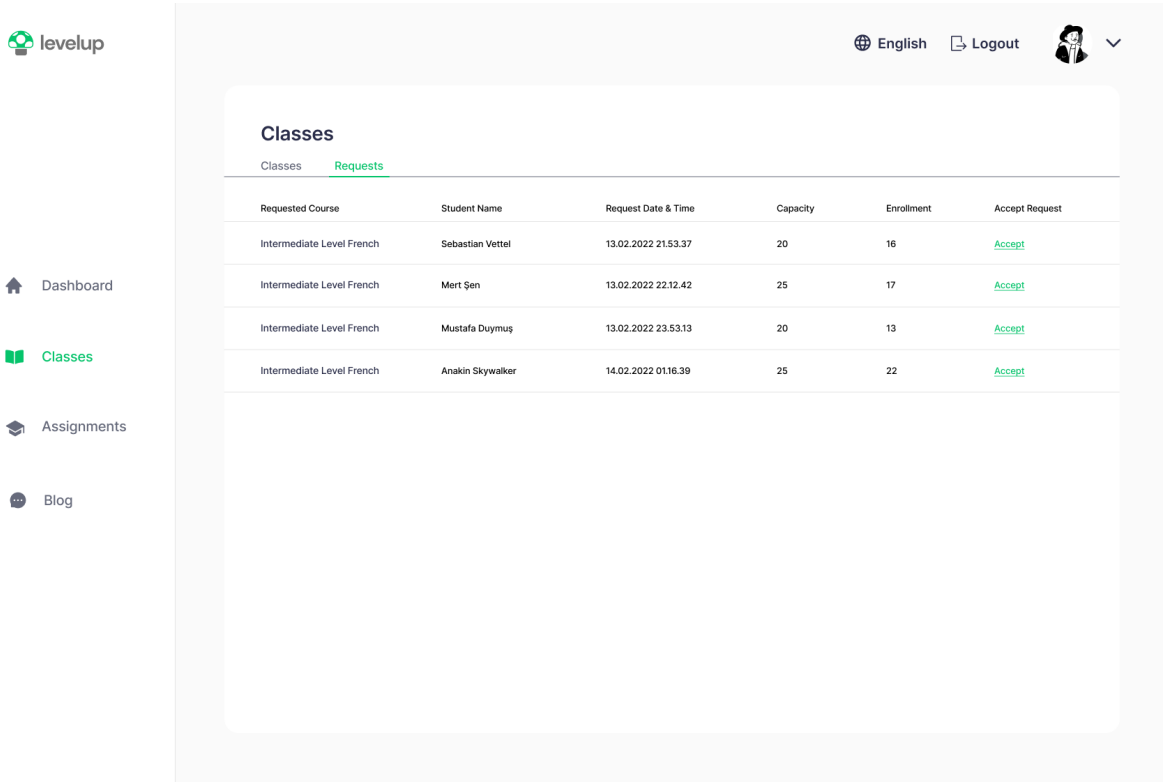
WHERE S.user_id = U.id AND G.homework_id = H.id AND G.student_id = S.user_id AND HU.homework_id = H.id AND H.grade IS NULL AND HU.data AND H.id = @homework_id;



SELECT C.title, Le.level_title, C.start_date, C.end_date, C.capacity, C.enrollment

FROM class C, level Le, language La

WHERE C.level_id = Le.id AND C.lang_id = La.id AND C.teacher_id = @teacher_id;



SELECT C.title, U.name, R.created_at, C.capacity, C.enrollment

FROM class C, request_class R, student S, user U

WHERE U.id = S.user_id AND C.id = R.class_id AND R.student_id = S.user_id AND C.teacher_id = @teacher_id;