🎓 Ethics Dashboard Student Side Developer Guide

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You can also find a very similar markdown file to this one in our Github in the “documentation” folder, it is a bit easier to read.

Table of Contents

Project Description

The **Ethics Dashboard** is a responsive web application designed to facilitate ethical decision-making for students, instructors, and teaching assistants. It provides a structured framework to analyze ethical dilemmas through visual and interactive tools.

Key Features:

1. **Ethics Dashboard**: A central hub presenting a visual summary of ethical analyses and inputs in real-time.
2. **Ethical Analysis Framework**: Guides users through a structured Seven-Step Framework for decision-making.
3. **Global Ethical Lenses**: Includes both Western and non-Western ethical theories, emphasizing diverse perspectives.
4. **Self-Reflection Tools**: Encourages evaluation using universal ethical principles to build personal and global ethical awareness.
5. **Instructor Feedback**: Allows instructors to assess student progress, provide feedback, and assign grades.
6. **User-Friendly Interface**: Features guided prompts, step-by-step inputs, and a clean navigation system for seamless usability.
7. **Secure Accounts**: Supports user authentication and integration with learning platforms (e.g., Moodle).

Scope:

- **Student Workflow**: Input ethical dilemmas, analyze using various frameworks, and generate comprehensive reports.
- **Instructor Workflow**: Evaluate student work through dashboards and detailed reports.
- **Backend Logic**: Stores user data, executes framework logic, and ensures secure data handling.

Project Timeline:

- **Dec 1**: Ethics Dashboard prototype with partial functionality.
- **Mar 1**: Fully functional application ready for testing.
- **Apr 1**: Final revisions based on feedback.
- **End of Term**: Launch for use in applied ethics courses.

By combining interactive learning with comprehensive ethical analysis tools, the **Ethics Dashboard** aims to enhance ethical education through an engaging and globally inclusive approach.

Install the Project

You must have the following installed as prerequisites:

- Docker
- Python

You can download the project files from Cody Jorgensons GitHub repo, titled ethicdDashboard and the professor side of the project titled Ethics-Dashboard-Prof
Clone the repository locally on your device.
The repo is private at the time of writing this, you may need to request access.

Alternatively the files are all stored on the kamatera server, you can copy the directories, delete the .git directory and re-initialize the github repo under your ownership.

If the link is broken, the GitHub username is c-jorg. You can also reachCody by his email at cjorgenson39@gmail.com, and he can help you get access.

I recommend installing the project in your root C:/ folder for easy access.

Run the Project Development Environment

Navigate to the ethicdDashboardt directory via command line and run the following commands to build and start the Docker containers:

```
$ docker-compose -f compose.dev.yml up —build
```

then navigate to localhost in your browser to see the log in page.

The compose.dev.yml file builds the project with development variables, nginx container and without certbot, instead using a self signed ssl certificate.

This will start the next.js development environment, and you should now be able to log in on localhost

Since you just created your database, it will be empty, so you will need to create an account first.

- Remember that students have to be invited to create an account, so you have to manually put in the students email into the database Students table (or use the Professor side to invite a student).

As for the rest of your database, we have a database dump file full of dummy data that you can use to populate your database if you want. That will be explained in another section.

To access the postgres database, execute the following command in the ethicdDashboard directory:

```
$ docker exec -it db psql -U postgres
```

How to populate DB with the DB dump

The file in the root of the project titled “dml_dump.sql” contains dummy data.

To populate the database using this file, follow these steps:

1. Copy dml_dump.sql from Host to the Database Container
   Run this command on your host system to copy the SQL dump file into the container:

   ```
   docker cp C:/ethicdDashboard/dml_dump.sql
   db:/tmp/dml_dump.sql
   ```

2. Access the Database Container Terminal
   Start an interactive shell session inside the database container:

   ```
   docker exec -it db bash
   ```

3. Import the DML Dump into PostgreSQL
   Once inside the container, use the following command to populate the database:

   ```
   psql -U postgres -d postgres -f /tmp/dml_dump.sql
   ```

4. Exit the Container
   After the import is complete, exit the container:

   ```
   exit
   ```

API Documentation

Link to API documentation on postman
You may need to request access. Otherwise, view the ethicdDashboard GitHub Repo and download the API documentation file from the “documentation” folder in the root of the project and import it to Postman.

If you are struggling with Postman, you can also just look at the Controllers file in the backend and look at the routes in there. It is less straightforward but it will give you the same information.

What API routes do we have?

Assignments routes

Authorization routes

Students routes

Question routes

Feedback routes

Grade routes

Enrollment routes

Case Study routes

Form Description routes

Slider Question routes

Guest routes

Getting started guide

To start using the APIs, you need to know:

- The API returns request responses in JSON format. When an API request returns an error, it is sent in the JSON response as an error key. Some APIs return message keys rather than error keys which will be highlighted in the individual route details.
- The frontend uses axios to make requests to the API.

Api jwt token

To make an api request, you must have the proper authorization header using a valid jwt token.

- frontend/app/utils/api-auth.ts will add the authorization header using the jwt token in local storage
- Run backend/utils/dev_token.py to generate a jwt token to use in manual api requests and tests

Student

The following endpoints let you manage and retrieve information about student users.

GET Get all students

```
http://localhost:4000/api/flask/students
```

Returns a JSON list full of all student data (passwords are hashed).

PATCH Update consent

```
http://localhost:4000/api/flask/student/consent
```

Update the consented column in the database to true or false

Body JSON

```json
{
    "consent": "no",
    "id": 1

}
```

GET Get consent

```
http://localhost:4000/api/flask/student/consent?user_id=1
```

Returns a JSON with a true/false value of the users data consent status

GET Get email

```
http://localhost:4000/api/flask/student/email?student_id=1
```

Returns a JSON containing a string of the students email

Authorization

The following endpoints perform authentication, user registration and session handling.

POST Register student

```
http://localhost:4000/api/flask/auth/register-student
```

Student users need to be invited to create an account, so in order to test this API you must first add the email for the student you want to register into the backend database in the students table.

A student is "invited" if their email is in the students table. However, if a student's email is in the database AND they already have a password/name set up, their account has already been created.

Body JSON

json

```json
{
    "name":"StudentName",
    "email":"test@mail.com",
    "password":"Password1",
    "consent":"false"

}
```

POST Login student

```
http://localhost:4000/api/flask/auth/login-student
```

This will return a JSON object containing the token, with the key "token"

Also returns "id" for student ID, and "name" for the students name.

Body JSON

```json
{
    "email":"uniquetest@mail.com",
    "password":"Password1"

}
```

POST Validate token

```
http://localhost:4000/api/flask/auth/validate-token
```

Returns a JSON with a success message and the users email decoded from the token

Body JSON

```json
{
    "token":"insert token here"

}
```

POST Change student password

```
http://localhost:4000/api/flask/auth/change-student-password?oldPassword=old&newPassword=n
ew&id=1
```

Changes the students password in the database, and returns a JSON success message if completed

Body JSON

```json
{
    "id":"1",
    "oldPassword":"Password1",
    "newPassword":"Password1"

}
```

POST Login professor

http://localhost:4000/api/flask/auth/login-professor

Checks the credentials against the database, and if successful returns a JSON success message, token, id, and name associated with the credentials (This route is unused in this version)

Body JSON

```json
{
    "email":"test@test.com",
    "password":"Password1"

}
```

POST Register professor

http://localhost:4000/api/flask/auth/register-professor

Creates credentials for a new professor in the database, provided the email matches an existing row. Returns JSON with id, name, email, and password(hashed)

Body JSON

```json
{
    "name":"ProfessorName",
    "email":"uniqueprof@mail.com",
    "password":"Password1"


}
```

POST Register TA

`http://localhost:4000/api/flask/auth/register-ta`

Creates credentials for a new TA in the database, provided the email matches an existing row. Returns JSON with id, name, email, and password(hashed)

Body JSON

```json
{

    "name":"TAName",
    "email":"uniqueta@mail.com",
    "password":"Password1"


}
```

POST Register as Guest

`http://localhost:4000/api/flask/auth/register-guest`

Creates a new guest user in the students table, using a randomly generated email and password. Populates the guest user with a class and three assignments of varying completion. Automatically logs in with this new user. Return JSON with, success message, token, id, and name.

POST Change student email

`http://localhost:4000/api/flask/auth/change-student-email`

Updates the students email in the database, needs correct credentials. Returns JSON with success message containing the new email

Body JSON

```json
{
    "student_id":"2",
    "new_email":"stu@email.com",
    "password":"Password1"

}
```

DELETE Delete student

`http://localhost:4000/api/flask/auth/student`

Deletes the student and any related data completely from all database tables if credentials match and they have not consented to the data collection agreement and logs them out, returns JSON with success message and data consent. If they have consented to the data collection then their email and name will be deleted and the deleted column with be changed to true, returns JSON with success message and data consent

Body JSON

```json
{

    "student_id":"17",

    "password":"Password1"

}
```

Assignments

These endpoints support assignment data saving and retrieval. Also support retrieving assignments for a particular user.

POST Save answers

```
http://localhost:4000/api/flask/assignment/save-form
```

Saves the form answers into the db. First it deletes all the old answers associated with the form then new answers are saved. Each answer from the "answers" list in the request JSON will have an entry into the answers table. Returns a JSON success message.

Body JSON

json

```json
{
  "student_id": "1",
  "assignment_id": "1",
  "case_study_id": "1",
  "form_name": "dilemma",
  "answers": {
    "dilemma-0": "conflict_of_interest",
    "dilemma-1": "false",
    "dilemma-2": "false",
    "state-the-problem": "test",
    "gather-facts-1": "i dont know!\n",
    "gather-facts-2": "somewhere really cool",
    "gather-facts-3": "like yesterday?",
    "stakeholder-name-0": "?!",
    "stakeholder-directly-0": "directly",
    "stakeholder-indirectly-0": "false",
    "stakeholder-name-1": "test!",
    "stakeholder-directly-1": "false",
    "stakeholder-indirectly-1": "indirectly",
    "stakeholder-name-2": "test!",
    "stakeholder-directly-2": "directly",
    "stakeholder-indirectly-2": "false",
    "stakeholder-name-3": "test!",
    "stakeholder-directly-3": "false",
    "stakeholder-indirectly-3": "indirectly",
    "stakeholder-name-4": "test!",
    "stakeholder-directly-4": "directly",
    "stakeholder-indirectly-4": "false",
    "stakeholder-name-5": "test!",
    "stakeholder-directly-5": "false",
    "stakeholder-indirectly-5": "indirectly",
    "stakeholder-name-6": "test!",
    "stakeholder-directly-6": "directly",
    "stakeholder-indirectly-6": "false",
    "option-title-0": "my option 1",
    "option-description-0": "my description 1",
    "option-title-1": "my cooler option 2",
    "option-description-1": "my cooler description 2",
    "option-title-2": "coolness option",
    "option-description-2": "coolness description",
    "option-title-3": "cute option",
    "option-description-3": "cute description",
    "option-title-4": "silly option :P",
    "option-description-4": "silly description",
    "harm-yes-0": "yes",
    "harm-no-0": "false",
    "publicity-yes-0": "yes",
    "publicity-no-0": "false",
    "reversible-yes-0": "yes",
    "reversible-no-0": "false",
    "harm-yes-1": "false",
    "harm-no-1": "no",
    "publicity-yes-1": "false",
    "publicity-no-1": "no",
    "reversible-yes-1": "false",
    "reversible-no-1": "no",
    "harm-yes-2": "yes",
    "harm-no-2": "false",
    "publicity-yes-2": "yes",
    "publicity-no-2": "false",
    "reversible-yes-2": "yes",
    "reversible-no-2": "false",
    "harm-yes-3": "false",
    "harm-no-3": "no",
    "publicity-yes-3": "false",
    "publicity-no-3": "no",
    "reversible-yes-3": "false",
    "reversible-no-3": "no",
    "harm-yes-4": "yes",
    "harm-no-4": "false",
    "publicity-yes-4": "yes",
    "publicity-no-4": "false",
    "reversible-yes-4": "yes",
    "reversible-no-4": "false",
    "tentative-choice-0": "false",
    "tentative-choice-1": "false",
    "tentative-choice-2": "false",
    "tentative-choice-3": "false",
    "tentative-choice-4": "silly option :P",
    "num_stakeholders": "7"
  }
}
```

POST Submit answers

```
http://localhost:4000/api/flask/assignment/submit-form
```

Saves the form answers into the db. First it deletes all the old answers associated with the form then new answers are saved. Each answer from the "answers" list in the request JSON will have an entry into the answers table. Creates a new entry into the submissions table, for the assignment_id, student_id, and the form_id. Returns a JSON success message..

Body JSON

json

```json
{
    "student_id": "1",
    "assignment_id": "2",
    "case_study_id": "2",
    "form_name": "dilemma",
    "answers": {
        "dilemma-0": "false",
        "dilemma-1": "false",
        "dilemma-2": "false",
        "state-the-problem": "explosions!",
        "gather-facts-1": "it did!",
        "gather-facts-2": "my house!",
        "gather-facts-3": "fuck you!",
        "stakeholder-name-0": "a",
        "stakeholder-directly-0": "false",
        "stakeholder-indirectly-0": "false",
        "stakeholder-name-1": "b",
        "stakeholder-directly-1": "false",
        "stakeholder-indirectly-1": "false",
        "stakeholder-name-2": "c",
        "stakeholder-directly-2": "false",
        "stakeholder-indirectly-2": "false",
        "stakeholder-name-3": "d",
        "stakeholder-directly-3": "false",
        "stakeholder-indirectly-3": "false",
        "stakeholder-name-4": "e",
        "stakeholder-directly-4": "false",
        "stakeholder-indirectly-4": "false",
        "stakeholder-name-5": "",
        "stakeholder-directly-5": "false",
        "stakeholder-indirectly-5": "false",
        "stakeholder-name-6": "",
        "stakeholder-directly-6": "false",
        "stakeholder-indirectly-6": "false",
        "option-title-0": "",
        "option-description-0": "",
        "option-title-1": "",
        "option-description-1": "",
        "option-title-2": "",
        "option-description-2": "",
        "option-title-3": "",
        "option-description-3": "",
        "option-title-4": "",
        "option-description-4": "",
        "harm-yes-0": "false",
        "harm-no-0": "false",
        "publicity-yes-0": "false",
        "publicity-no-0": "false",
        "reversible-yes-0": "false",
        "reversible-no-0": "false",
        "harm-yes-1": "false",
        "harm-no-1": "false",
        "publicity-yes-1": "false",
        "publicity-no-1": "false",
        "reversible-yes-1": "false",
        "reversible-no-1": "false",
        "harm-yes-2": "false",
        "harm-no-2": "false",
        "publicity-yes-2": "false",
        "publicity-no-2": "false",
        "reversible-yes-2": "false",
        "reversible-no-2": "false",
        "harm-yes-3": "false",
        "harm-no-3": "false",
        "publicity-yes-3": "false",
        "publicity-no-3": "false",
        "reversible-yes-3": "false",
        "reversible-no-3": "false",
        "harm-yes-4": "false",
        "harm-no-4": "false",
        "publicity-yes-4": "false",
        "publicity-no-4": "false",
        "reversible-yes-4": "false",
        "reversible-no-4": "false",
        "tentative-choice-0": "false",
        "tentative-choice-1": "false",
        "tentative-choice-2": "false",
        "tentative-choice-3": "false",
        "tentative-choice-4": "false",
        "num_stakeholders": "7"
    }
}
```

GET Get answers

```
http://localhost:4000/api/flask/assignment/get-answers?user_id=1&form_name=dilemma&assignment_id=1
```

Returns a JSON with a success message and a list of all the answers associated with the student_id, assignment_id and the form_id.

GET Is form submitted

```
http://localhost:4000/api/flask/assignment/is-form-submitted?form_name=dilemma&assignment_id=1&student_id=1
```

Queries database to check if a submission exists for this form_id, assignment_id and student_id. Returns JSON with value true or false.

GET Get assignments for student

```
http://localhost:4000/api/flask/assignments?user_id=1
```

Returns a JSON array with all assignment details for the student.

GET Get assignments for student class

```
http://localhost:4000/api/flask/assignments?user_id=1&class_id=1
```

Returns a JSON array with assignment details for a specific class for the student.

PATCH Set case study options

```
http://localhost:4000/api/flask/assignment/set-case-study-option
```

Sets the case study option for the assignment. Returns JSON success message

Body JSON

```json
{
    "assignment_id": 1,
    "case_study_option": 1
}
```

GET Is assignment submitted

```
http://localhost:4000/api/flask/assignment/submitted?assignment_id=1
```

Checks the submissions table to see if there is a submission for each form. Returns JSON message true/false

Questions

API routes related to the custom/dynamic questions that professors can add to case studies

GET Get questions

```
http://localhost:4000/api/flask/questions?form_name=life-path&case_study_id=1
```

Returns a JSON list of all the dynamic question text associated with the form and case study

GET Get total questions

```
http://localhost:4000/api/flask/questions/total?form_name=generations-form&case_study_id=1
```

Returns a JSON with the total amount of dynamic questions associated with that form and case study

Feedback

API routes related to professor comments/feedback that show up on the forms after they have been submitted

GET Get feedback for form

```
http://localhost:4000/api/flask/feedback?form_name=life-path&assignment_id=1
```

Returns a JSON list of dictionaries containing the key and value of the feedback

Grade

API routes related to student grades

GET Get grade

```
http://localhost:4000/api/flask/grade?form_group=Consequences&assignment_id=1
```

Returns JSON with the grade of the student for that form and assignment

GET Get grades

`http://localhost:4000/api/flask/grades?assignment_id=1`

Returns JSON list with all of the grades for each form for that assignment

Enrollment

API routes used to get information about enrollments.

GET Get enrollments

`http://localhost:4000/api/flask/enrollments?student_id=1`

Returns JSON list of the students enrollments, class_id, class_name, professor

POST Enroll student

`http://localhost:4000/api/flask/enrollment`

Adds an entry into the enrollment table. Returns JSON success message, and class name

Body JSON

json

```json
{
    "student_id":"1",
    "class_id":"1"

}
```

Case Studies

API routes used to get information about case studies.

GET Get options

```
http://localhost:4000/api/flask/case-study/options?case_study_id=1
```

Returns JSON list of all the case_study_options associated with that case_study_id

Form Description

API routes used to manage form descriptions.

Form descriptions are the introductory blurbs of text that exist before some forms, professors can edit these descriptions and add links to them.

GET Get description

```
http://localhost:4000/api/flask/form-description?assignment_id=1&form_name=cons-util-bentham
```

Returns JSON of the form description associated with that assignment_id and form_name

Slider Questions

API routes used for managing slider questions.

These refer to the types of questions which use sliders/range inputs. They consist of the question, and the labels for either end of the slider.

GET Get Slider Questions

```
http://localhost:4000/api/flask/slider-questions?case_study_id=1&form_name=generations-form
```

Returns a JSON list of all the slider questions associated with that case_study_id and form name

GET Get Total Slider Questions

```
http://localhost:4000/api/flask/slider-questions/total?case_study_id=1&form_name=generations-form
```

Returns a JSON with the total number of sliders questions on that form for that case_study_id

Guest

API routes for handling guests.

POST Set up guest

```
http://localhost:4000/api/flask/guest/setup
```

Adds the proper entries into the database to allow guest mode to work. Only needed when setting up a new database. Returns JSON success message

DELETE Delete all guests

```
http://localhost:4000/api/flask/guest/delete-guests
```

Deletes all the guest users and all the data associated with them in the database. Returns JSON success message

Architecture

MVC - Model View Architecture
The backend folder holds the Model and Controllers while the frontend folder holds the Views.

Model

We are using SQLAlchemy in our Flask app as our ORM (Object Relational Mapping).
We have created classes for each entity in our database. All models are in the Model file in the backend folder.

View

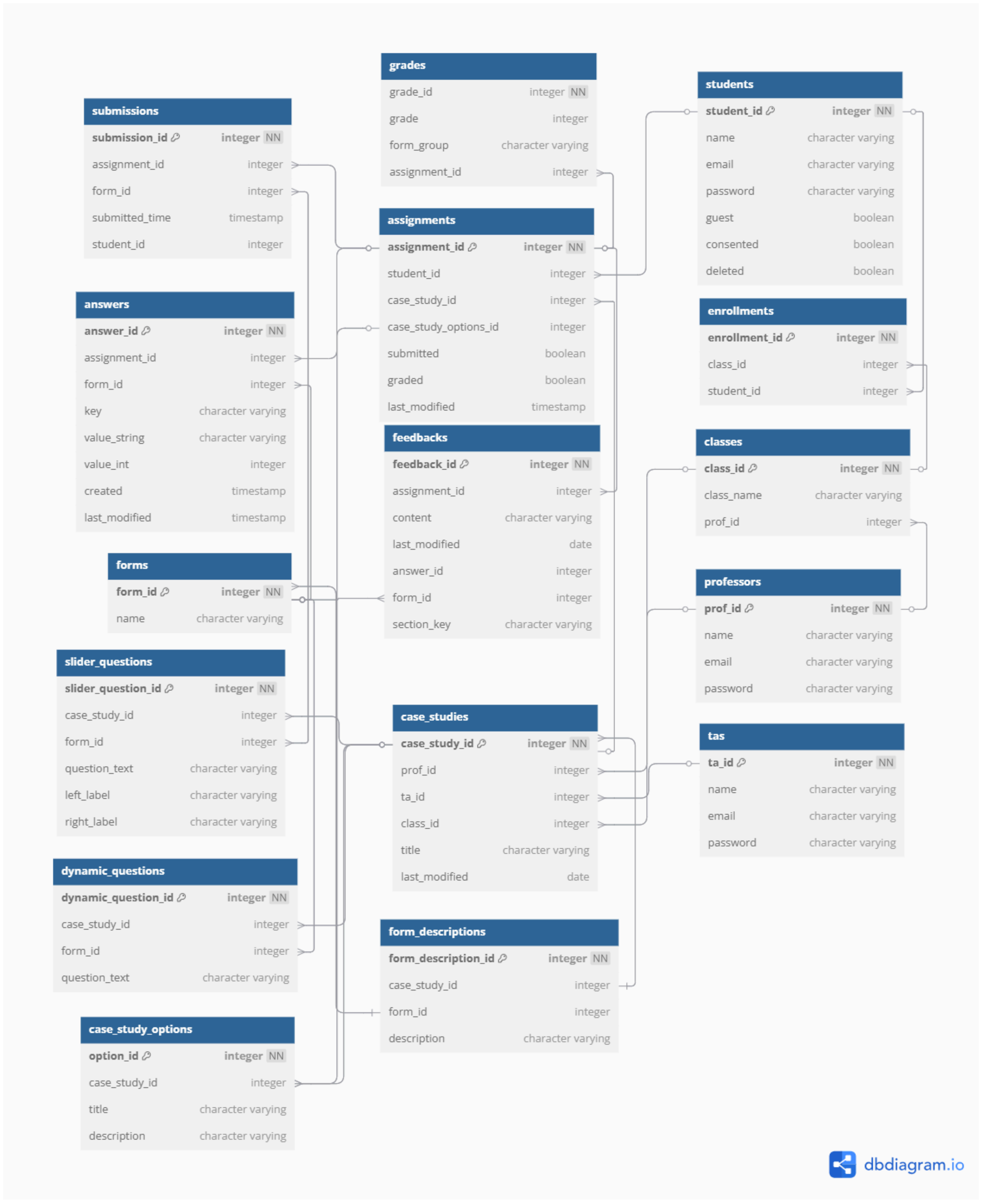
We are using Next.js for our frontend. Each file titled “page.tsx” is a view. All views are in the /frontend/app folder.

Controller

We are using API calls (routes) to handle information flow from the database to the frontend, all of our controllers are in the Controller file in the backend folder.

DB Diagram

[Link to view diagram online]



Tables Overview

1. Submissions

- Holds information for a submitted assignment.

2. Grades

- Holds the grades for an assignment.
- **Form group** contains the following possible values:
  - Seven Step Method
  - Consequences
  - Role
  - Past Actions
  - Reason
  - Care Ethics
  - Intersectionality
  - Seven Generations
  - Virtue Ethics
  - Life Path
  - Universal Principles
- *Note: Creating a `form_group` table might be a good improvement to the database.*

3. Students

- Stores student information.

4. Assignments

- Represents an assigned case study, associated with a student.

5. Answers

- Stores the answers submitted for an assignment.

6. Enrollments

- Captures the relationship between classes and students.

7. Classes

- Stores information about classes.

8. Forms

- Holds form names and their corresponding IDs.

9. Professors

- Stores professor information.

10. TAs (Teaching Assistants)

- Stores TA information.

11. Case Studies

- Holds templates for case studies.
- When a professor creates a case study with custom questions, it is stored here.
- Assignments pull particular case study templates from this table.

12. Case Study Options

- Each case study has several options for the "Case" the student can analyze.
- These options are stored here.

13. Slider Questions

- Stores custom slider-type questions created by professors.

14. Dynamic Questions

- Stores custom text input questions created by professors.

15. Form Descriptions

- Some forms have an introductory paragraph.
- Professors can edit and add links.
- This content is pulled from this table.

16. Feedbacks

- Holds professor comments associated with a particular assignment and form.
- Has a section_key column which represents which section of the form the feedback is for.

Section Key Values

- `section_key` represents which part of a form the comment is for.

- Valid values for `section_key` include:

Seven Step Method

- `select-dilemma` - Comment box for selecting the dilemma at the top of the form.
- `test-options` - Comment box for the test options section.
- `tentative-choice` - Comment box for the tentative-choice section.
- `dilemma` - Comment box for the whole form.

Relations

Care Ethics

- `care-form-stakeholders` - Comment box for stakeholders section of Care Ethics form.
- `care-form` - Comment box for the whole Care Ethics form.

Intersectionality

- `stakeholder-feedback-${index}` - Feedback for a stakeholder in the intersectionality form.
- `intersect-form` - Feedback for the whole intersectionality form.

Seven Generations

- `generations-stakeholders` - Comment box for the stakeholders section.
- `generations-form` - Comment box for the whole form.

Consequences

Stakeholders

- `stakeholder-analysis` - Comment box for stakeholder analysis in the Stakeholders form.
- `cons-stakeholders` - Comment box for the whole Stakeholders form.

Utilitarianism

- `cons-util-bentham` - Feedback for the whole Bentham form.
- `cons-util-mill` - Feedback for the whole Mill form.

Action and Duty

Reason

- `critical-questions` - Comment box for the whole critical questions form.
- `categorical-imperatives` - Comment box for the whole Categorical Imperatives form.

Roles

- `moral-duties` - Comment box for the moral duties section.
- `personal-sacrifices` - Comment box for the whole form.

Past Actions

- `duties-sliders` - Feedback for sliders on the Past Actions form.
- `duties-versus-actions` - Comment box for the whole form.

Character and Virtue

Virtue Ethics

- `domains` - Feedback for the domains section.
- `virtue-ethics` - Feedback for the whole form.

Life Path

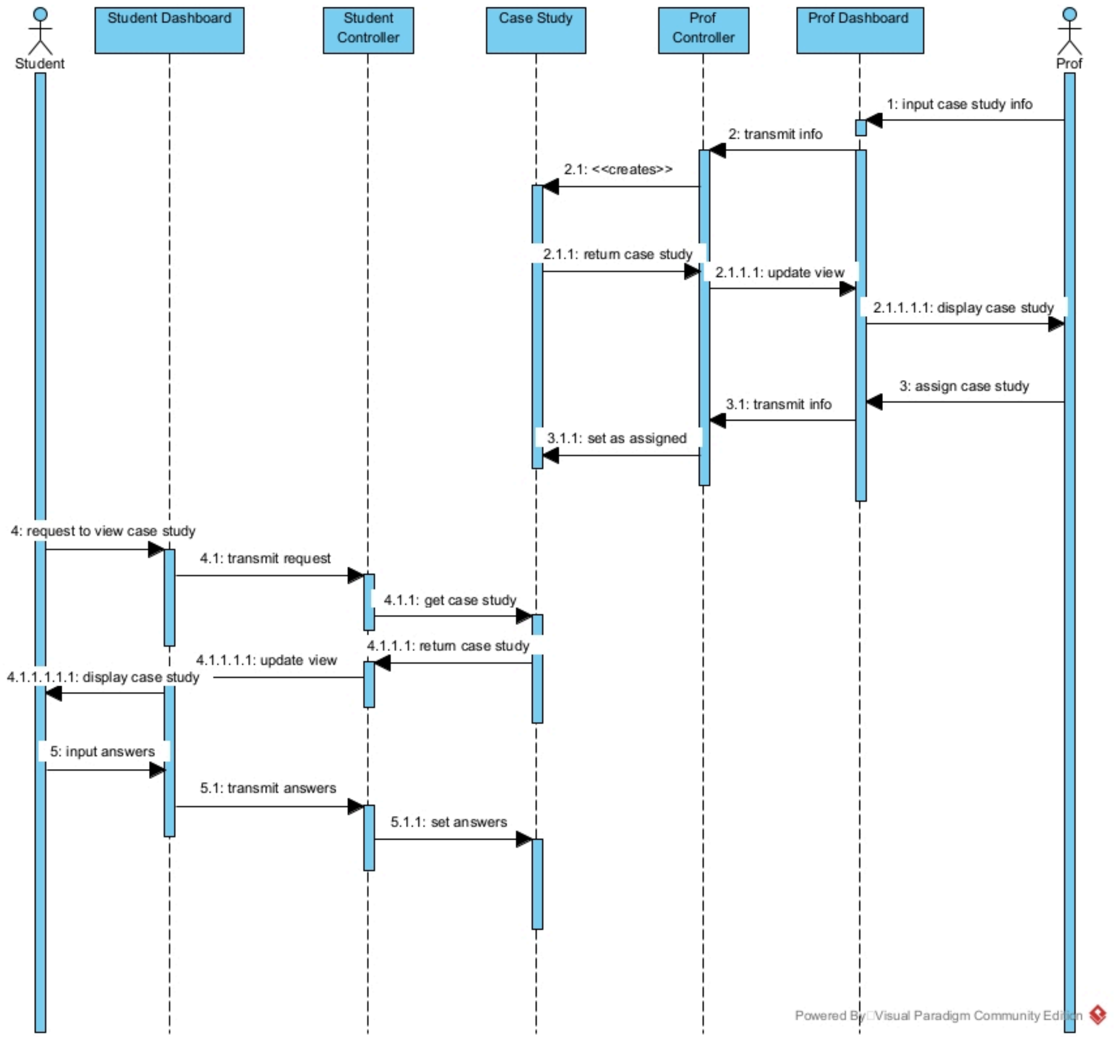
- `life-path-sliders` - Feedback for sliders on the Life Path form.
- `life-path` - Feedback for the whole form.

Universal Principles

- `up-sliders` - Feedback for the sliders.
- `universal-principles` - Feedback for the whole form.

Sequence Diagram

Interaction with Professor side through the shared DB.



How to add a model

1. Define the model

   Create a new Python file in your models directory (e.g., `models/my_model.py`) and define the model using SQLAlchemy.

   Example:
   ```
   from .db import db, ma

   class MyModel(db.Model):
       __tablename__ = "my_models"  # Replace with your table name

       id = db.Column("id", db.Integer, primary_key=True)
       name = db.Column("name", db.String, nullable=False)

       def __init__(self, name):
           self.name = name

       def json(self):
           return {'id': self.id, 'name': self.name}

       def __repr__(self):
           return f"MyModel({self.id}, {self.name})"

       @classmethod
       def get_by_id(cls, id):
           return cls.query.filter(cls.id == id).first()

       @classmethod
       def get_by_name(cls, name):
           return cls.query.filter(cls.name == name).first()
   ```

2. Create a Schema for Marshmallow

   To serialize and deserialize the model, create a schema using Marshmallow.

   ```
   class MyModelSchema(ma.SQLAlchemyAutoSchema):
       class Meta:
           model = MyModel
           session = db.session
           load_instance = True
   ```

3. Register the model in __init__.py

   To ensure the model is recognized by the application, add an import in the `models/__init__.py` file.

   ```
   from .my_model import MyModel, MyModelSchema
   ```

   Then, add `MyModel` and `MyModelSchema` to `__all__`:

   ```
   __all__ = [
       # Other models...
       'MyModel',
       'MyModelSchema',
   ]
   ```

4. Manually add the model to your database with DDL
   (we don't have migration set up to capture changes to the DB after the initial container has been built, if you don't want to do this you have to delete your DB container and rebuild it from scratch, but you will lose all data inside it).

How to add a controller/API route

Follow these steps to create and register a new controller in your Flask backend:

---

1. Navigate to the Controllers Directory

Go to the `backend/controllers` directory in your project.

---

2. Create a New Controller File

Create a new Python file named after your desired controller. The file name should reflect its purpose, e.g., `student_controller.py` for handling student-related endpoints.

---

3. Import Necessary Modules

At the beginning of your new controller file, import the required modules:

```
from flask import Blueprint, jsonify, make_response, request
from .models import YourModel  # Replace with your actual model
```

---

4. Register Your Controller with a Blueprint

Create a Blueprint for your controller. The first argument should be a unique identifier for your controller.

```
bp = Blueprint('your_controller', __name__)  # Replace
'your_controller' with an appropriate name
```

---

5. Define API Routes

Create your API routes within the controller. Below is an example of a `GET` request to fetch all students:

```
@bp.route('/api/flask/students', methods=['GET'])
```

```
def get_students():
    try:
        students = YourModel.query.all()  # Replace with your actual model
        students_data = [{'id': student.id, 'name': student.name} for student
in students]
        return jsonify(students_data), 200
    except Exception as e:
        return make_response(jsonify({'message': 'Error retrieving students',
'error': str(e)}), 500)
```

Replace:

- `/api/flask/students` with the appropriate endpoint.
- `methods=['GET']` with the applicable HTTP methods (`POST`, `PUT`, `DELETE`, etc.).
- `YourModel.query.all()` with the relevant query.

---

6. Register the Controller in `app.py`

Open `backend/app.py` and ensure the new controller is imported:

```
from .controllers import your_controller  # Replace with your
controller file name
```

Then, register the blueprint in the `create_app()` function:

```
app.register_blueprint(your_controller.bp)
```

---

7. Restart Your Flask Server

To apply the changes, rebuild the docker containers:

```
docker-compose build
docker-compose up
```

Summary of Steps

1. **Navigate to** `/backend/controllers`.
2. **Create a new Python file** named after your controller.
3. **Import necessary modules** (`Blueprint`, `jsonify`, `make_response`, and your models).
4. **Register a Blueprint** and define API routes.
5. **Add the controller to** **`app.py`** and register its blueprint.
6. **Rebuild the docker containers** to apply changes.

How to add a view

Our frontend uses **Next.js** with an **App Router structure**, so follow these steps to properly add a new page or UI component.

---

1. Creating a New Page

To add a new page:

1. **Navigate to** `/frontend/app`.
2. **Create a new folder** inside `app/`, named after your new page.
   - For example, if you're adding a "profile" page, create `/frontend/app/profile`.
3. **Inside the new folder, create the following files:**
   - `page.tsx` → This is the main entry point for the page.
   - `layout.tsx` → (Optional) If your page needs a custom layout, define it here.

Example `page.tsx`:

```
export default function ProfilePage() {
  return (
    <div>
      <h1>Profile</h1>
      <p>Welcome to your profile page!</p>
    </div>
  );
}
```

---

2. Adding UI Components

If your page requires reusable UI elements, **do not** define them directly in `page.tsx`. Instead:

1. **Navigate to** `/frontend/app/ui`.
2. **Create a new folder** for your page's UI components.
   - If the page is inside the dashboard, create a **subfolder inside the dashboard** (e.g., `/frontend/app/ui/dashboard/profile`).
3. **Add UI components or forms** inside this folder.

Example Component (`/frontend/app/ui/profile/ProfileForm.tsx`):

```
"use client";
import { useState } from "react";

export default function ProfileForm() {
  const [name, setName] = useState("");

  return (
    <form>
      <label>Name:</label>
      <input value={name} onChange={(e) => setName(e.target.value)} />
      <button type="submit">Save</button>
    </form>
  );
}
```

4. **Import UI Components into `page.tsx`** Modify `page.tsx` to include the UI component:

```
import ProfileForm from "@/app/ui/profile/ProfileForm";

export default function ProfilePage() {
  return (
    <div>
      <h1>Profile</h1>
      <ProfileForm />
    </div>
  );
}
```

---

3. Reusable Components & Utility Functions

- **Reusable UI components** (used across multiple pages) go in: `/frontend/app/ui/components/`
  - Example: Buttons, Modals, Custom Input Fields.
  - Example file: `/frontend/app/ui/components/Button.tsx`
- **Utility functions** (helper functions, data formatting, API calls, etc.) go in: `/frontend/app/utils/`
  - Example: Fetching user data, formatting timestamps.
  - Example file: `/frontend/app/utils/fetchUser.ts`

Example Utility Function (`fetchUser.ts`):

```
export async function fetchUser(userId: string) {
  const res = await fetch(`/api/users/${userId}`);
  if (!res.ok) throw new Error("Failed to fetch user data");
  return res.json();
}
```

---

4. Testing Your Page

Once you've added your page and UI components, **start the development server** to test it:

```
pnpm dev
```

Visit `http://localhost:3000/profile` (or your page's route) to see it in action.

---

5. Summary of Steps

Create a new page:

- Add a folder inside `/frontend/app/`.
- Create `page.tsx` and optionally `layout.tsx`.

Add UI components:

- Place page-specific UI in `/frontend/app/ui/`.
- Reusable components go in `/frontend/app/ui/components/`.

Organize utility functions:

- Store helper functions in `/frontend/app/utils/`.

Test your page by running `npm run dev`.

How to create and run tests

1. Navigate to the Test Directory

All tests are stored in the `/backend/tests/` folder.

```
cd backend/tests
```

If this directory doesn't exist, create it:

```
mkdir -p backend/tests
```

---

2. Create a New Test File

Create a new test file in the `/backend/tests/` directory. The file should be named `test_<feature>.py`, where `<feature>` is the feature being tested.

Example:

```
touch test_slider_questions.py
```

---

3. Import Necessary Modules

At the top of your test file, import required dependencies:

```
import os
import json
import pytest
from datetime import datetime
from backend.models import CaseStudy, Form, SliderQuestion
```

- `pytest` is our testing framework.
- `json` is used for parsing responses.

- `datetime` is for handling timestamps.
- `backend.models` contains the database models needed for testing.

---

4. Write Your Test Function

Each test function should follow this format:

- **Setup**: Create necessary database entries.
- **Action**: Make an API request using `client`.
- **Assertions**: Verify the response status and data.

5. Run Your Tests

Ensure your virtual environment is activated, then run:

```
pytest
```

To run a specific test file:

```
pytest backend/tests/test_slider_questions.py
```

To see detailed output:

```
pytest -v
```

Using the Server and Deployment

The current server used for deployment is a ubuntu virtual machine. You can connect to it via ssh cosc471@213.255.209.162 with password cosc471 in a terminal window.

Deployment on the Server

1. Connect to server via terminal window

   ```
   ssh cosc471@213.255.209.162
   ```

   When the request for a password appears enter

   ```
   cosc471
   ```

2. Navigate to the ethicdDashboard directory

   ```
   cd ethicdDashboard
   ```

3. Build the Docker containers

   ```
   sudo docker compose build
   ```

4. Run the Containers

   ```
   sudo docker compose up
   ```

Production Testing Environment

When making any changes to the project, rebuilding the docker containers can sometimes take upwards of ten minutes, a workaround to waiting is to run npm in a production environment. The environment variables will use values from .env.

1. Navigate to ethicdDashboard
2. Run docker compose using the development environment

   ```
   sudo docker compose -f compose.dev.yml up —build
   ```