

TrakPal

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Abstract

TrakPal is a web application made to help college students stay on path and clear out the fluff allowing them to focus solely on the most optimal path to their career goals. Users are able to input their grades, compare their GPA to industry standards, and get career recommendations based on their academic performance. The goal is to bridge the gap between academics and career planning by providing grade tracking, career guidance, and insights based on academic performance.

Tools

Programming Languages: Python, SQL, HTML

Frameworks: Flask, MySQL, Bootstrap

Database: MariaDB

Version Control: GitHub

Project Management: GitHub

API Tools: Postman(for testing)

Team Structure

Team Size: Solo Developer

Responsibilities:

- Backend: Flask, MariaDB, SQL
- Frontend: HTML, CSS, UI Design
- Project Management: GitHub Boards, Roadmapping
- Database Design: ERD planning, schema creation

Interaction:

- Regularly discussed design ideas and progress with supervisor
- Feedback sessions helped refine UI/UX decisions

Role

I took care of the backend development using python and flask making sure the user can communicate with the database which is integrated using MariaDB. Also making the UI using Bootstrap and HTML so they user can easily understand what to do.

Roadmap

Week 1-2: Set up Flask & MariaDB, create database schema

Week 3-6: Implement user authentication & CRUD for grades

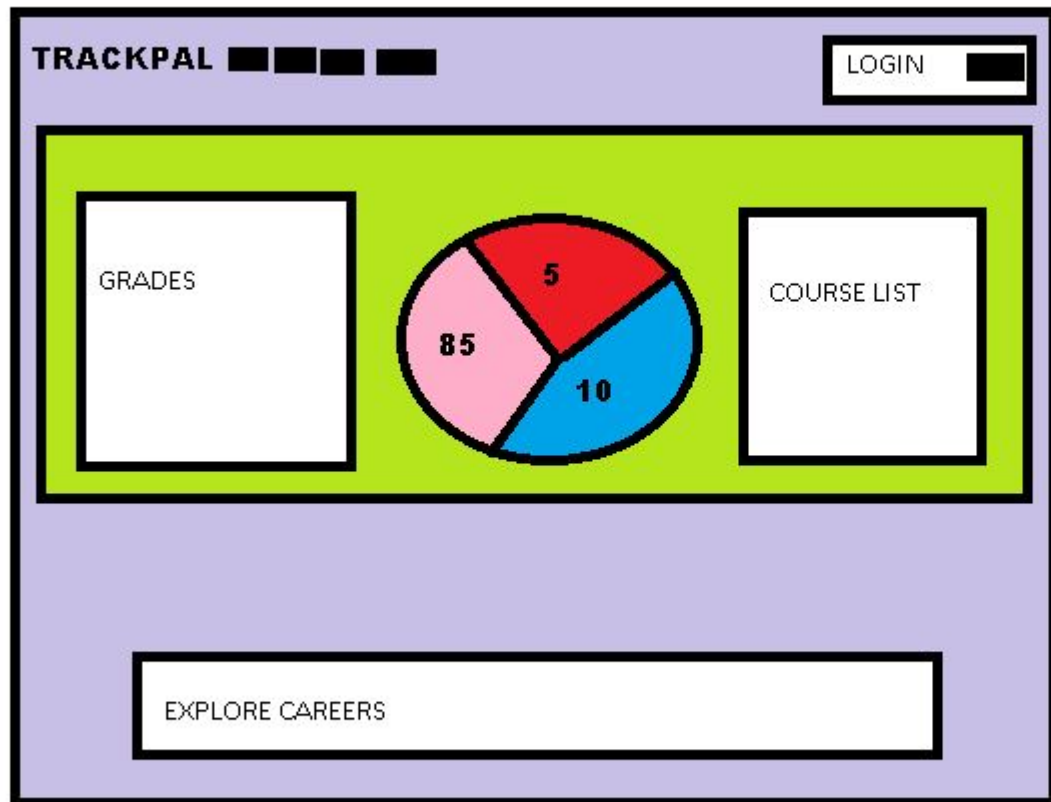
Week 7-9: Build career-matching logic

Week 10-11: Develop front-end UI

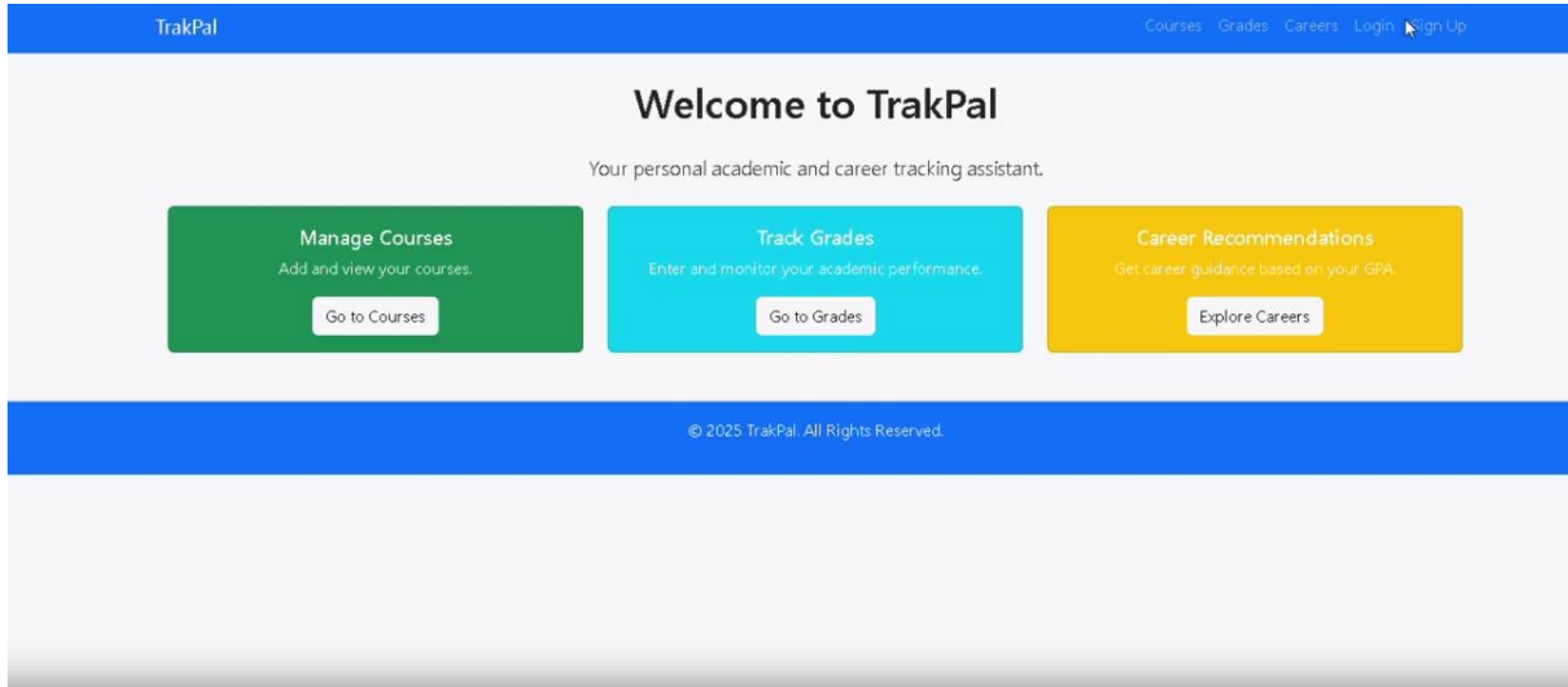
Week 12-13: Testing & bug fixes

Week 13-15: Final integration & documentation

Prototype UI



Early UI



Final UI

Welcome to TrakPal

Your personal academic and career tracking assistant.

User: Oluwatobi Owoaje

Major: Computer Science

Courses Taken: 4

GPA: 3.5

Manage Courses

Add and view your courses.

Go to Courses

Track Grades

Enter and monitor your academic performance.

Go to Grades

Career Recommendations

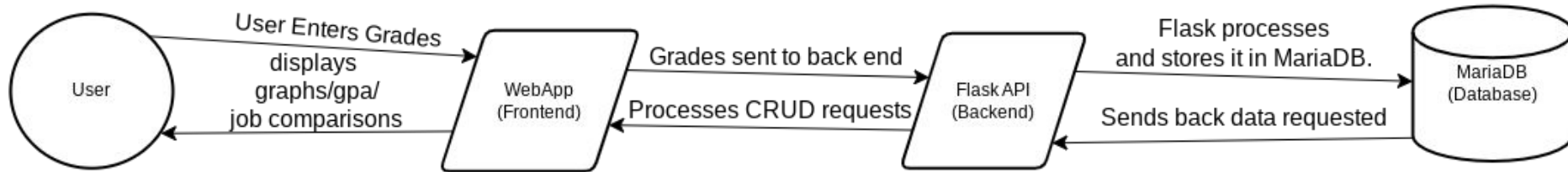
Get career guidance based on your GPA.

Explore Careers

Recommended Careers for You



Application Logic



Datasets

User-inputted grades

Predefined career data & job GPA requirements

Brooklyn College Courses

Use Cases 1: Tracking Grades

Input: User enters grades.

Process: TrakPal stores grades and updates GPA.

Output: GPA is displayed with career insights.

Use Case 2: Career Recommendation

Input: User selects career interest.

Process: TrakPal compares GPA to industry standards.

Output: TrakPal suggests career options and required courses.

Project Value

My project can be used to track grades of students so they can keep up with their academic progress. It can also match them with relevant career options based on grades.

Core Features

- User Authentication (Login/Signup with session tracking)
- Grades CRUD: Add, edit, delete, and view
- Courses CRUD: Admins manage course list
- Career Recommendations: Based on major + GPA
- Required Brooklyn College Courses based on major
- Summary Dashboard: Personalized overview
- Admin-only dashboard route

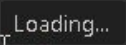
Tables in Database

```
Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.  
  
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.  
  
MariaDB [(none)]> use career_tracker;  
Database changed  
MariaDB [career_tracker]> show tables;  
+-----+  
Tables_in_career_tracker |  
+-----+  
careermatches  
careerrecommendations  
courses  
grades  
requiredcourses  
users  
+-----+  
6 rows in set (0.013 sec)  
  
MariaDB [career_tracker]> _
```


Code Snippet

Login route that allows
users with created accounts
to log in

```
128 # Login page - Handles both GET and POST requests
129 @app.route("/login", methods=["GET", "POST"])
130 def login():
131     if request.method == "POST":
132         email = request.form["email"]
133         password = request.form["password"]
134         cur = mysql.connection.cursor()
135         cur.execute("SELECT * FROM users WHERE email = %s", (email,))
136         user = cur.fetchone()
137         cur.close()
138         if user and check_password_hash(user[3], password):
139             session["user_id"] = user[0]
140             session["name"] = user[1]
141             session["is_admin"] = user[6]
142             flash("Logged in successfully!")
143             return redirect(url_for("home"))
144         else:
145             flash("Invalid credentials.")
146     return render_template("login.html")
147
```



Project Evolution- Previous Milestones

At the current moment, I made database tables for the project and implemented their CRUD to allow the tables to be manipulated

Next I will focus on authentication and creating a skeleton front end to make sure everything works as intended

There is an example of the database schema of a table I made in the next slide.

Features completed

- Built a fully functional web app from scratch
- Completed most of the original feature set
- Used real data models, realistic logic
- Showcased career mapping that works

A feature I let go

Original Idea:

- Visual display of course prerequisites and dependencies
- Help students plan future semesters better

Why It Was Abandoned:

- Time constraints
- Data complexity for edge cases
- Low direct impact compared to core functionality

A feature I'm proud of

I'm proud of the career matching logic I implemented, taking advice from my supervisor and implementing it into the project. Having a career have multiple majors helped me understand database normalizations and improve my creation of database relations.

Hardest Bug Faced

The Issue was that the grades entered by the user weren't updating properly in the database this was because there was improper handling of form input names and i was missing `commit()` on the SQL update query to fix this I cleaned form handling logic and used proper database commits. I learned from this bug to always log inputs, use debug messages, and test CRUD fully

New skills I learned

Flask

- Learned how routing, sessions, and templating work

MariaDB + MySQLdb

- Mastered joins, foreign keys, and CRUD operations

Frontend HTML/CSS/Bootstrap

- Created page layouts and forms from scratch and beautified them with bootstrap

Git + GitHub

- Learned branching, version control, and project board usage

UI/UX Decisions

I chose blue/black/white theme for clarity and professionalism

Kept layout minimal:

- Navbar consistent across all pages
- Tables for clarity
- Cards for career display

Used Bootstrap for responsiveness

What If Someone Else Took Over

If someone took over, they must understand:

- Flask routes + session handling
- MariaDB schema & relationships
- HTML template inheritance

They will need to have:

- Intermediate Python & SQL
- Basic GitHub
- Bootstrap/CSS familiarity

What I Would Do Differently

- Start testing the backend and frontend together earlier
- Use better sample data from the beginning
- Plan out admin features sooner
- Allocate more time toward cleaning and documenting code throughout

Timelogs

150+ hours spent

I logged each week based on how much hours spent doing things related to the course, i aimed to spend at least 15 hours per week. I would estimate most of my time was spent in the backend logic and database and also fixing bugs which there was a lot of them.

Positives

From the start of this project, I have learnt some new tools like how to integrate Flask with Python, how to use Postman to test CRUD and how to use MariaDB to name a few.

The skills i have learnt so far and the ones i will learn in the future are going to be useful as i can carry them over when making future projects or applying for internships

Final Reflection

Building TrakPal was the biggest coding project I've completed solo and my first project I put my heart into. The app is a real working product that could help students navigate grades and careers if more time and effort is put into it but I'm proud of how much I've learned technically and professionally and i'm ready to build even better tools in the future using these skills. Thanks to my supervisor Mr Connor for feedback and support.

Github Repo & Project Board

Repo Link: <https://github.com/Tobi156/TrakPal>

Board Link: <https://github.com/users/Tobi156/projects/1/views/9>

