VIRTA

A VIRTUAL TEACHING ASSISTANCE

TEAM NAME - LONE WOLF

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EVENT-D3 FEST

COLLEGE-IIIT BHUBANESHWAR

PROBLEM STATEMENT

The Automated Lab Grader (The “Digital TA”)

Teaching labs in university technical classes is plagued by manual, repetitive grading. Instructors spend more time checking syntax and edge cases than helping students learn concepts.Feedback is slow, often taking days or weeks, which prevents students from learning from their mistakes quickly.

Existing Learning Management System (LMS) tools lack robust, automated code execution and objective evaluation, leading to inconsistent scores across teaching assistants (TAs) and different lab sections.

DESCRIPTION

Develop an accessible , centralized platform for university labs that acts as an objective,real-time code judge.The goal is to liberate instructors from annual grading and give students ,instant accurate performances give students instant ,accurate performance feedback and clearing ranking

IDEATION

01

INSTRUCTOR ASSIGNMENT TOOLKIT

A secure dashboard where an instructor can:

- Define a new assignment (Title, Deadline, Language support: e.g., Python, C++, JavaScript).
- Upload a set of test cases (input file and expected output file) with assigned point values for each.

02

STUDENT SUBMISSION &INSTANT FEEDBACK

A clean student-facing page where a student can:

- Upload their solution file (e.g., lab1.py).
- Receive a score immediately, showing which public test cases passed and which failed, along with execution time.

03

LIVECODING EDITOR

An integrated editor where students can write, run, and test small code snippets before final submission, ensuring a smooth development workflow.

IDEATION

04

CENTRALIZED ANALYTICS

A section for the instructor to view overall class performance, including submission times, average scores, and a ranking/leaderboard of all students for motivation.

05

LEADERBOARD

A section that contains leaderboard of students so that they can access themselves

06

STORE

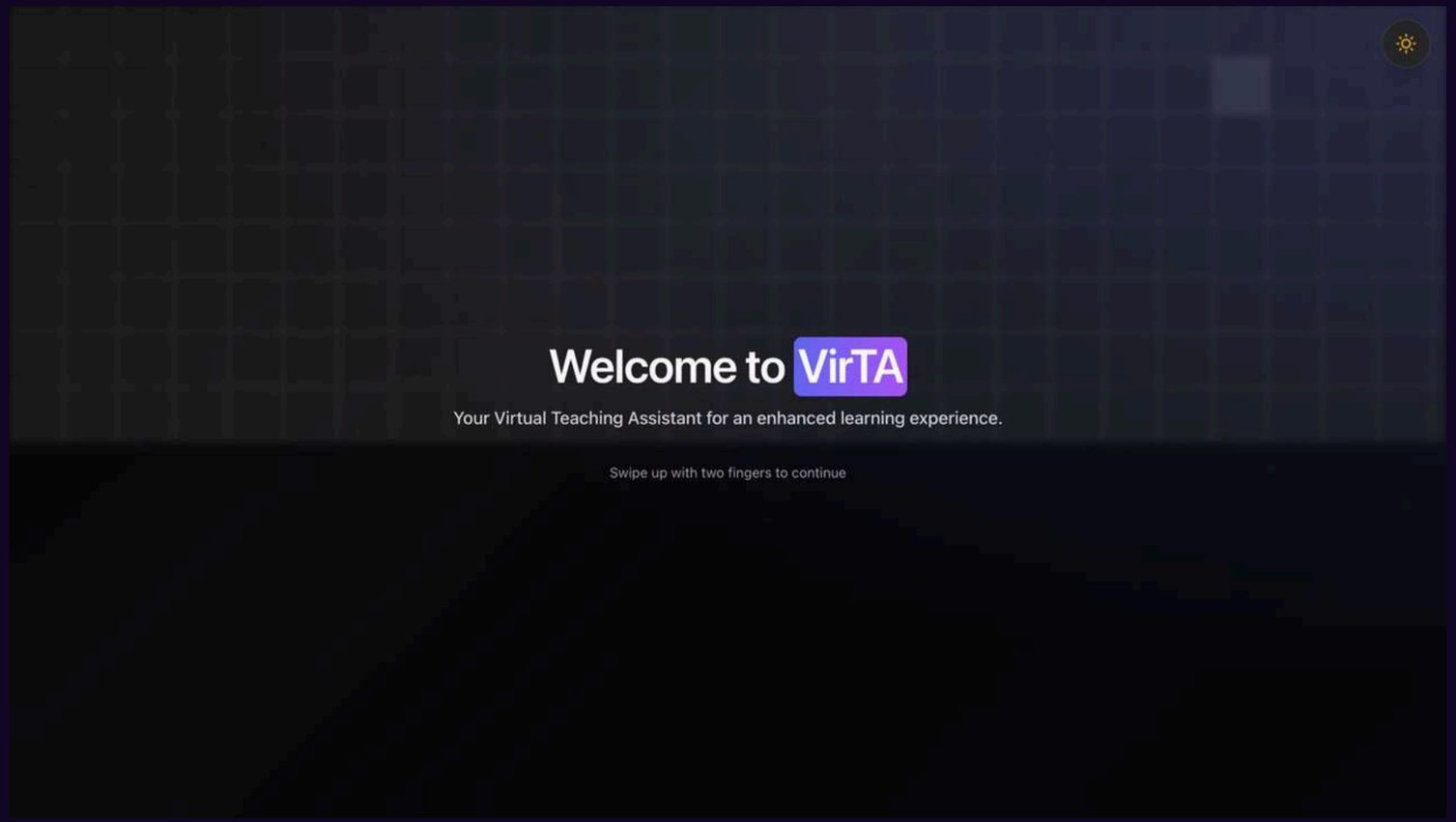
A section where according to coins one can buy avatars

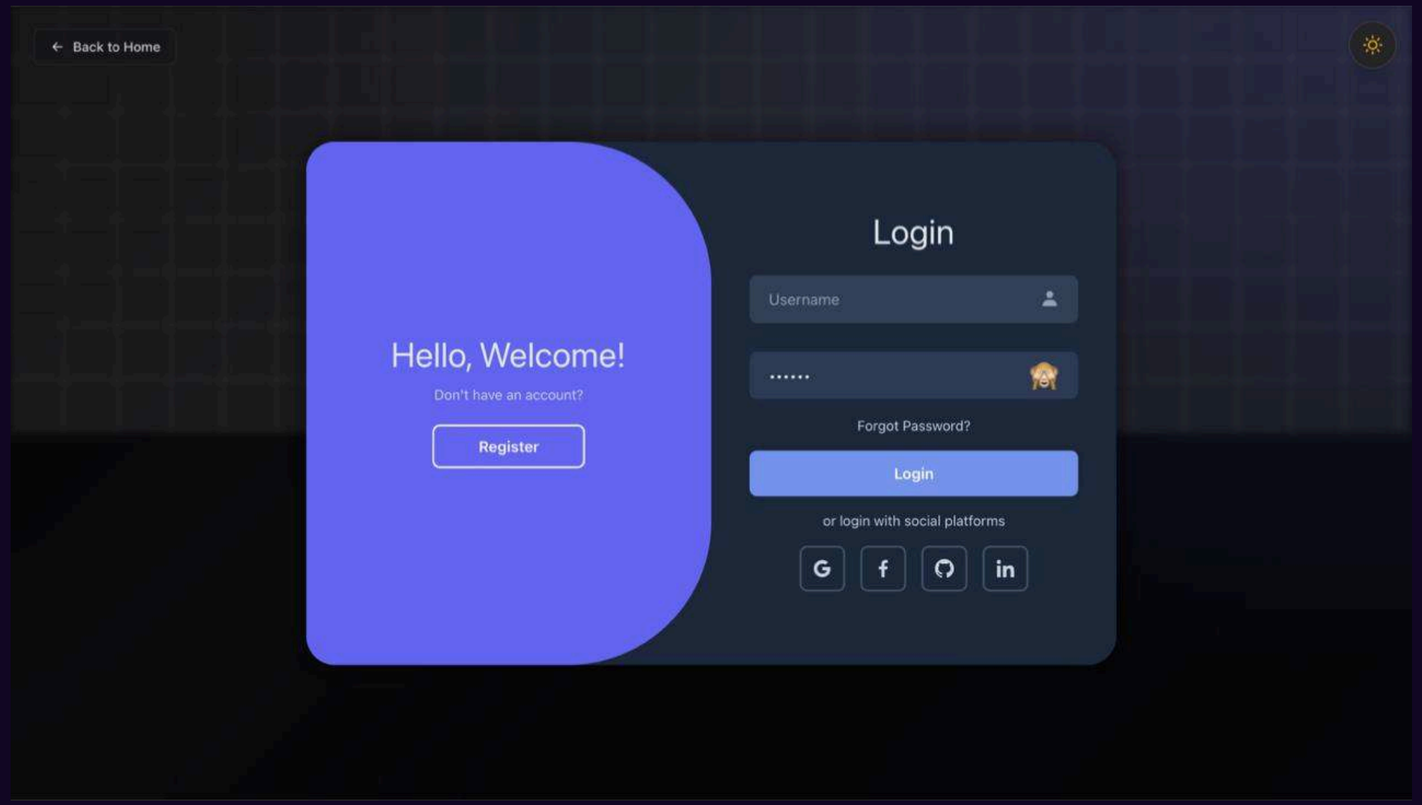
BENEFITS

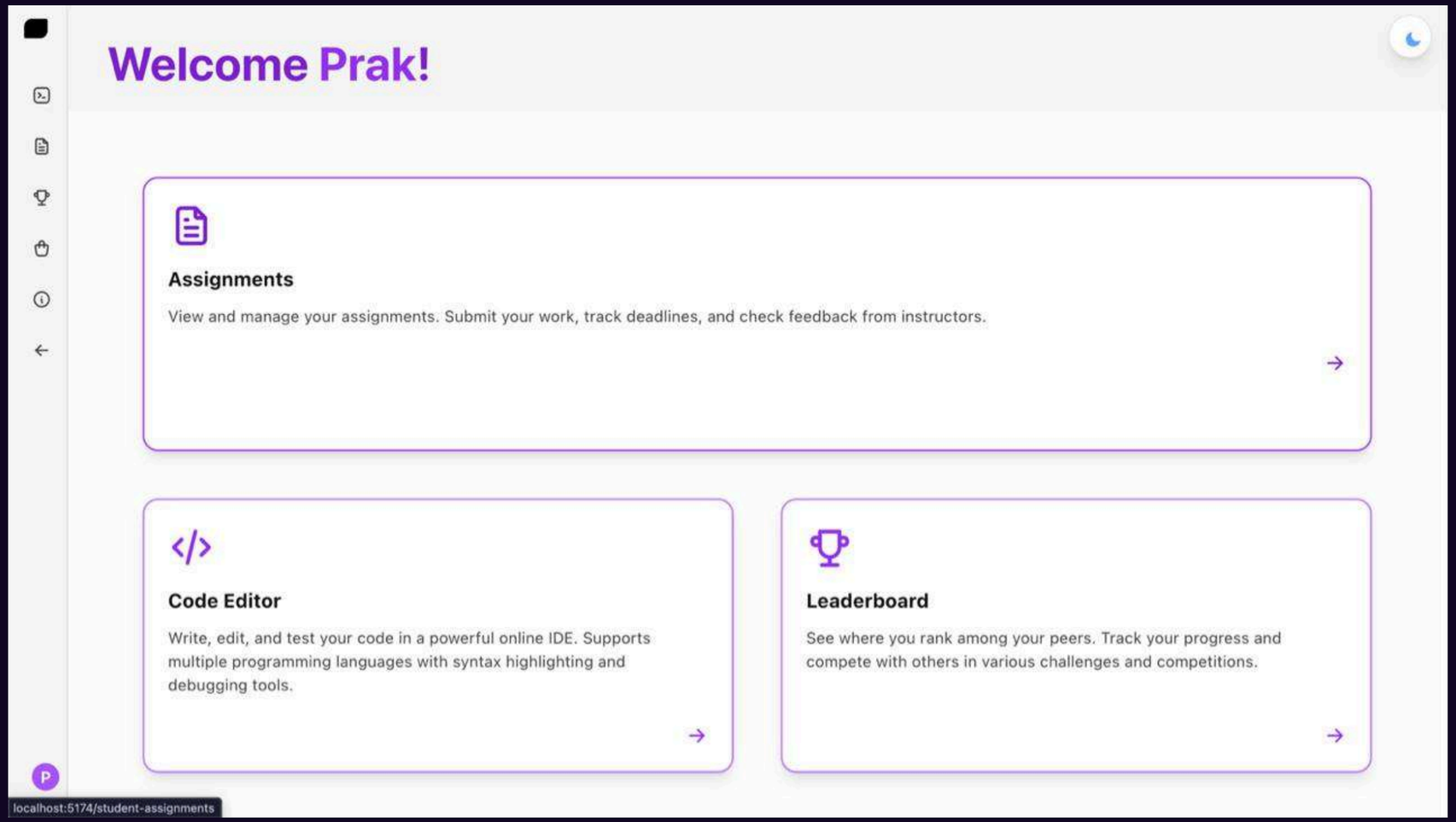
- **Faster and Fair Grading**-The system evaluates code instantly, removing delays caused by manual checking.
- **Saves Instructors' Time**-Professors and TAs no longer need to manually compile, run, and grade code submissions.
- **Instant Feedback for Students**- Promotes Better Learning-Students get immediate insights into which test cases passed or failed
- **Promotes Better Learning**-Encourages self-paced learning and experimentation — students can resubmit until they get it right.
- **Data-Driven Insights**-The analytics dashboard helps instructors understand class performance:
- Which assignments are too easy or too hard
- Average completion times and scores
- Student progress trends over time
- **Centralized & Organized Workflow**-Combines all grading, submissions, test cases, and analytics in one platform

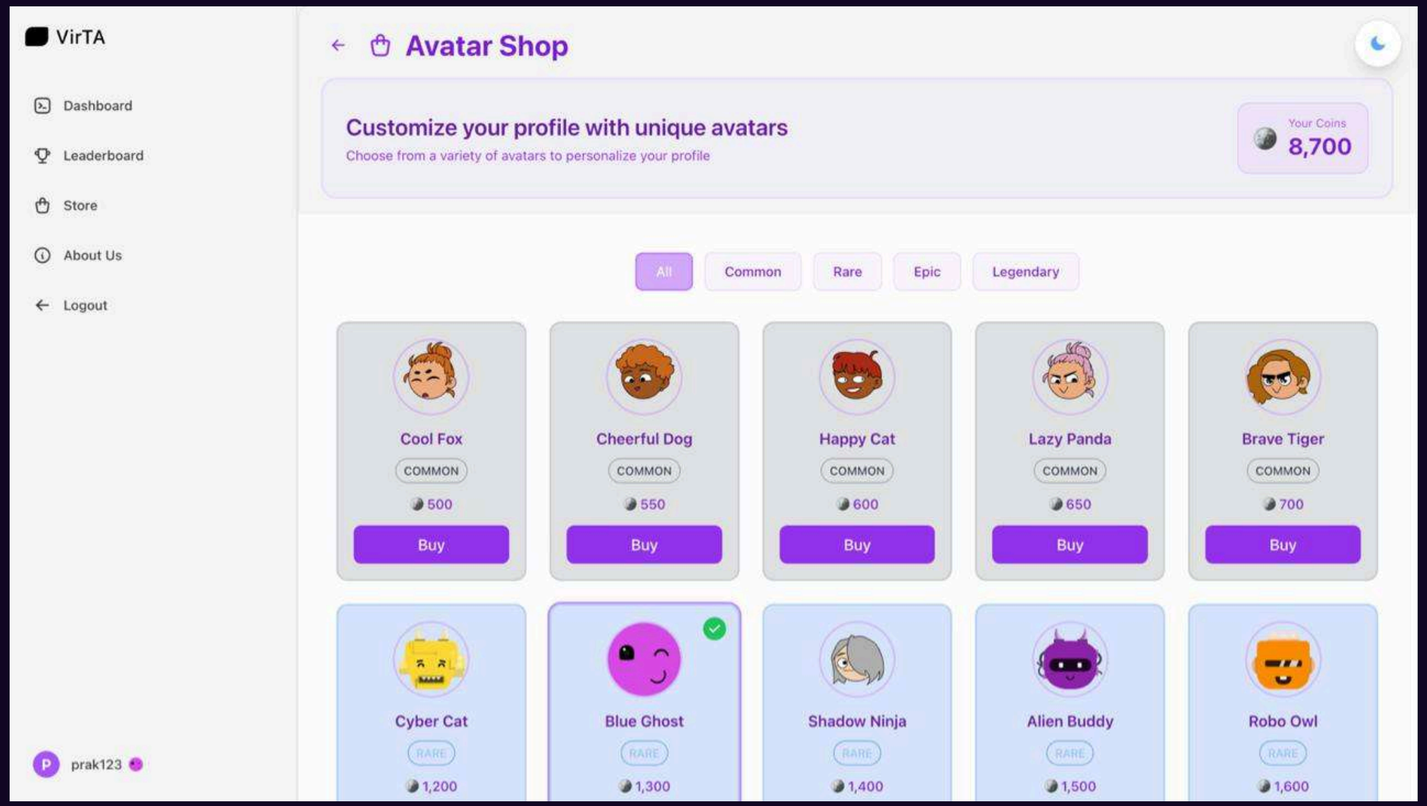
DEPENDENCIES

- Integration issue between backend APIs and frontend UI.
- Protecting user data, especially location and identity, from misuse or leaks.
- Handling thousands of live siver at a time can be a difficult task.
- High cost API.
- Less powerful servers.


Welcome to VirTA
Your Virtual Teaching Assistant for an enhanced learning experience.
Swipe up with two fingers to continue

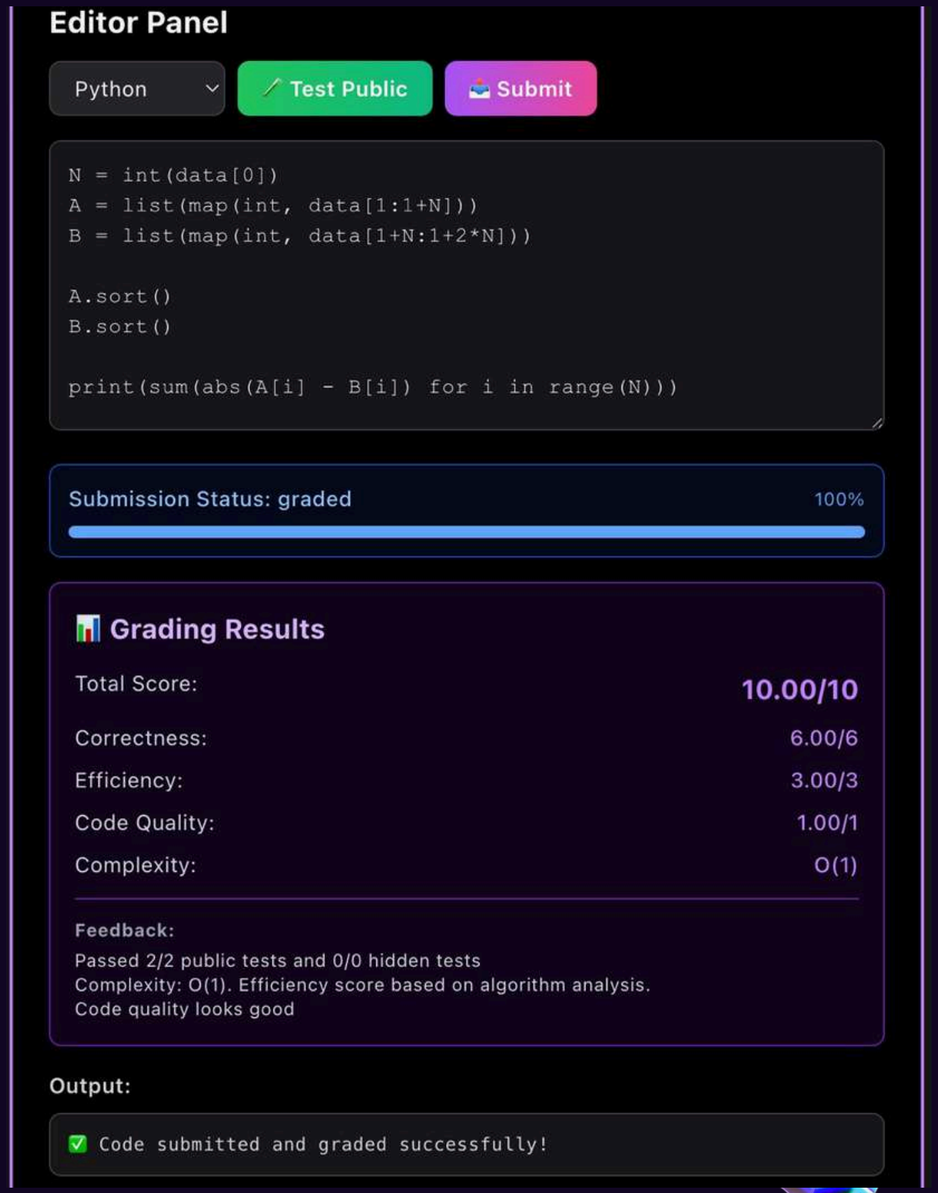

Back to Home
Hello, Welcome!
Don't have an account?
Register
Login
Username
.....
Forgot Password?
Login
or login with social platforms

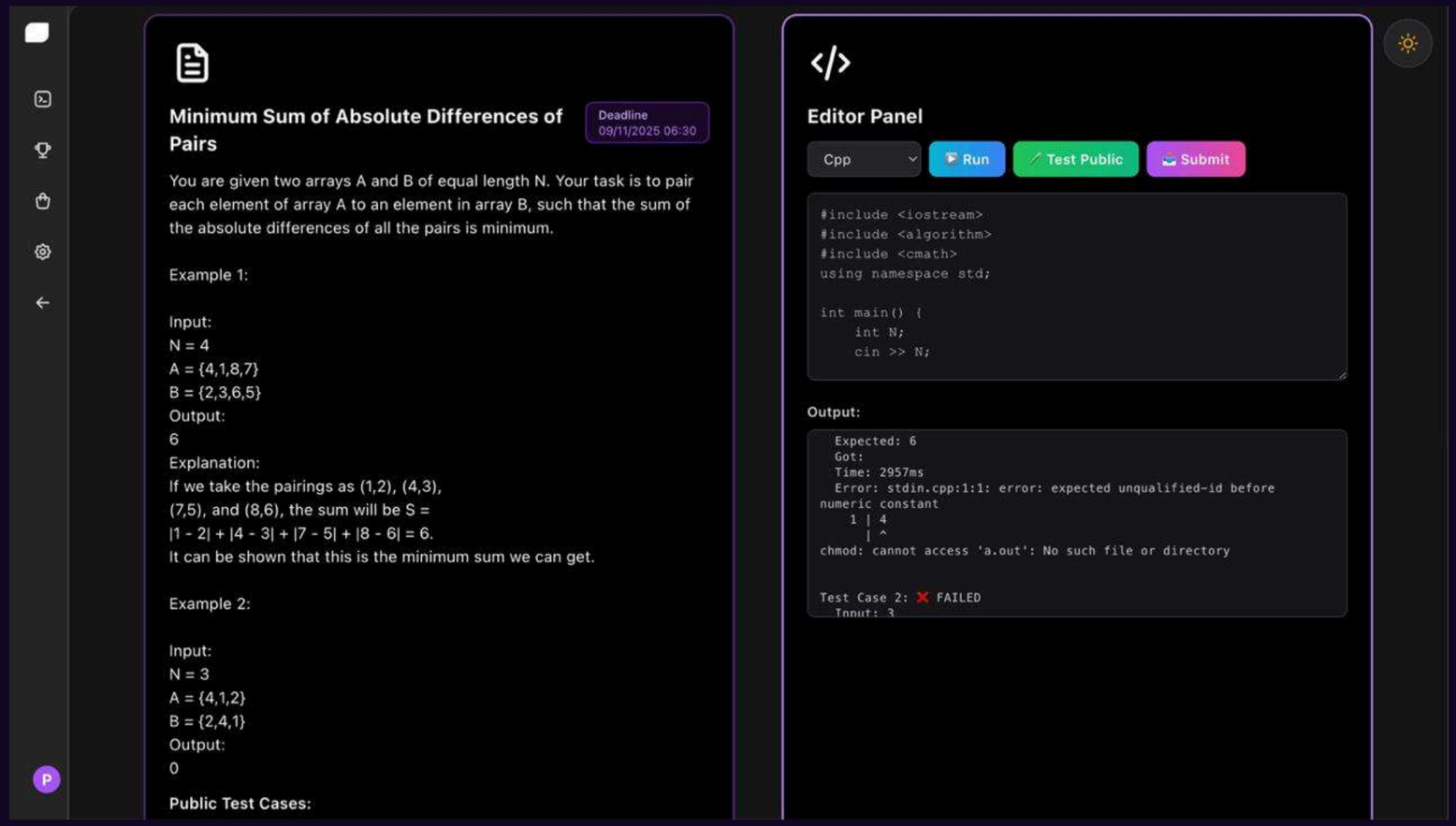

Welcome Prak!
Assignments
View and manage your assignments. Submit your work, track deadlines, and check feedback from instructors.
Code Editor
Write, edit, and test your code in a powerful online IDE. Supports multiple programming languages with syntax highlighting and debugging tools.
Leaderboard
See where you rank among your peers. Track your progress and compete with others in various challenges and competitions.
P
localhost:5174/student-assignments

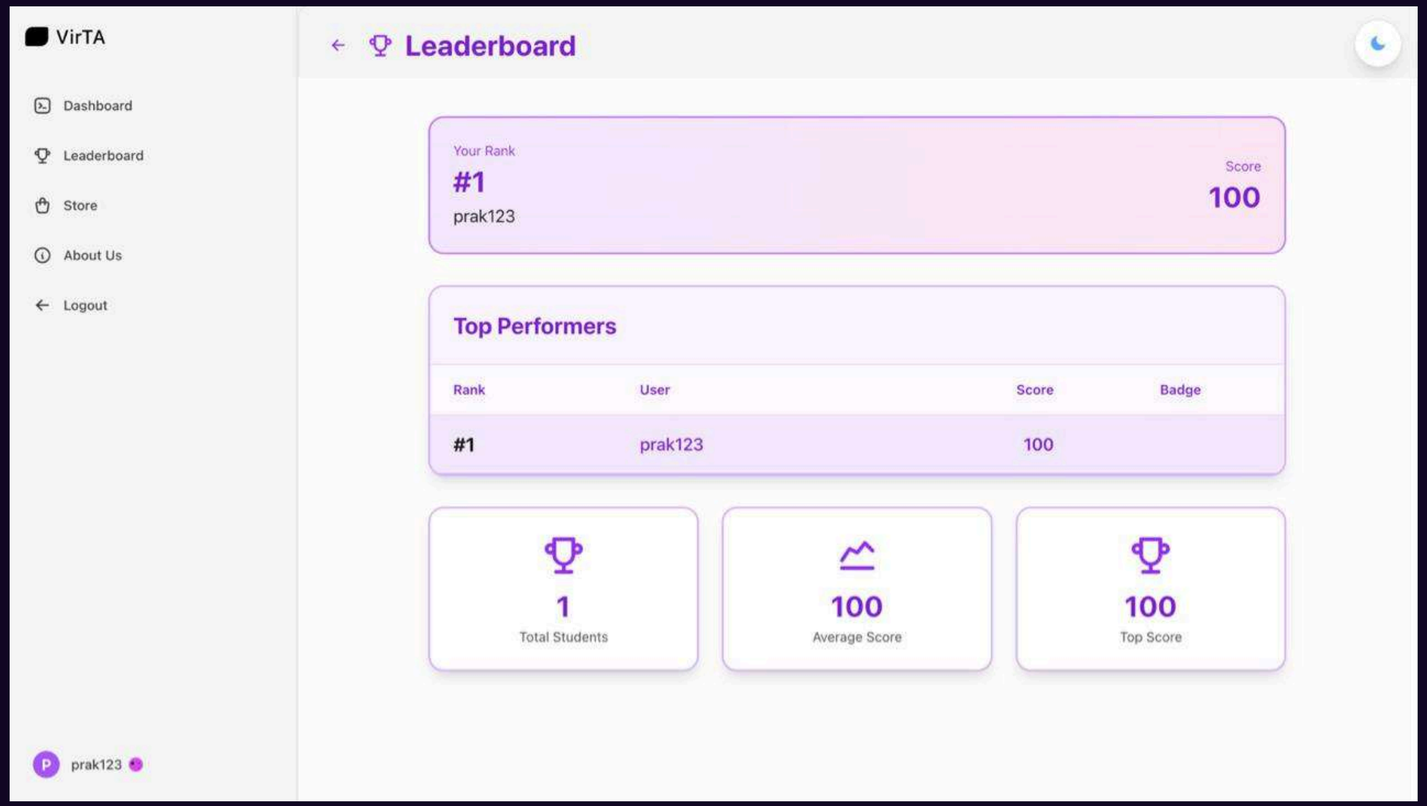

VirTA
Dashboard
Leaderboard
Store
About Us
Logout
prak123
Avatar Shop
Customize your profile with unique avatars
Choose from a variety of avatars to personalize your profile
Your Coins
8,700
All
Common
Rare
Epic
Legendary
Cool Fox
COMMON
500
Buy
Cheerful Dog
COMMON
550
Buy
Happy Cat
COMMON
600
Buy
Lazy Panda
COMMON
650
Buy
Brave Tiger
COMMON
700
Buy
Cyber Cat
RARE
1,200
Blue Ghost
RARE
1,300
Shadow Ninja
RARE
1,400
Alien Buddy
RARE
1,500
Robo Owl
RARE
1,600

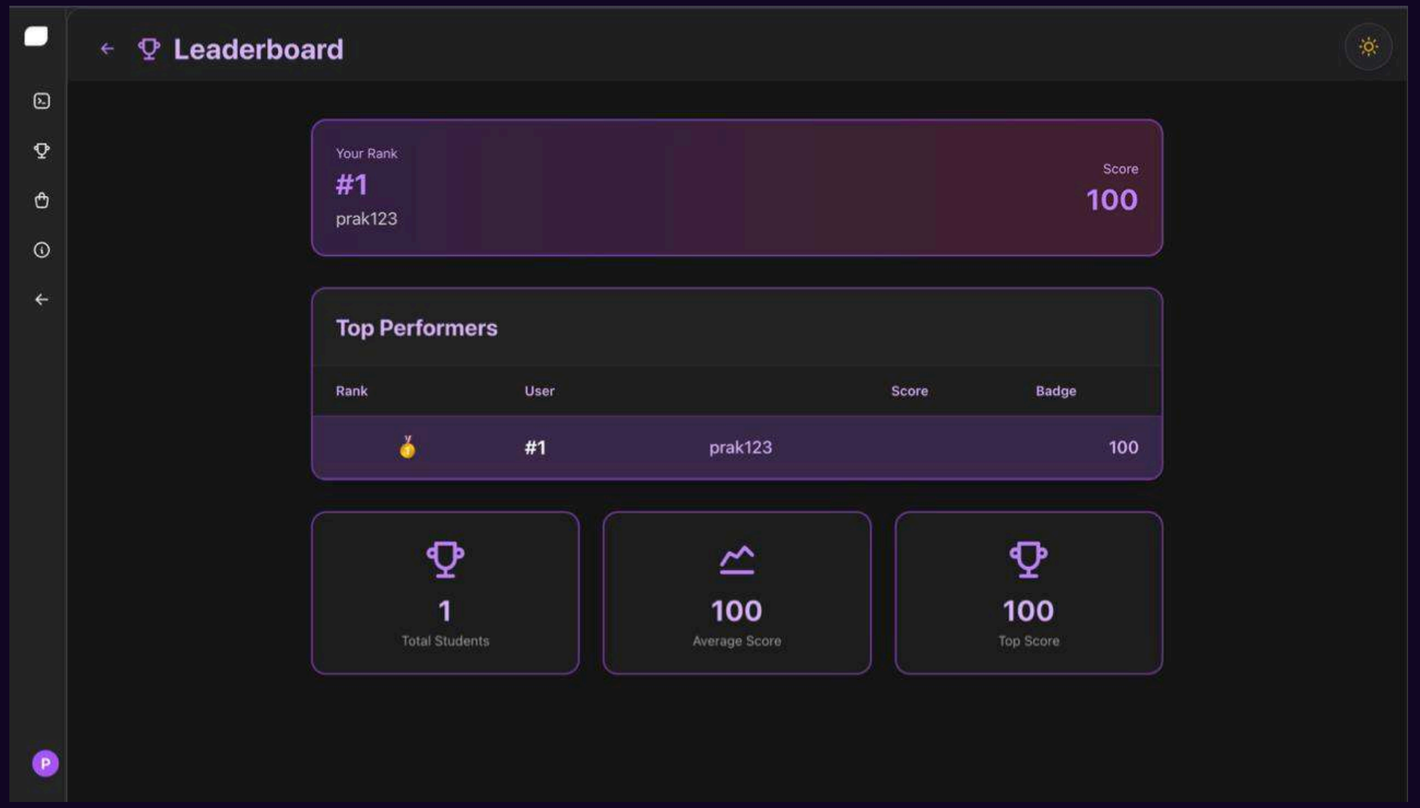
How It Works

1. **Student submits code** that solves the problem
2. **System runs both test cases:**
   - Test 1 (scale=4): Takes 20ms
   - Test 2 (scale=3): Takes 15ms
3. **System analyzes:**
   - `scaleRatio = 4/3 = 1.33`
   - `timeRatio = 20/15 = 1.33`
   - Since `timeRatio ≈ scaleRatio`, complexity is **O(n)** (linear)
4. **Student gets efficiency score**: 2.2 points (for O(n) complexity)




Minimum Sum of Absolute Differences of Pairs
Deadline
09/11/2025 06:30
You are given two arrays A and B of equal length N. Your task is to pair each element of array A to an element in array B, such that the sum of the absolute differences of all the pairs is minimum.
Example 1:
Input:
N = 4
A = {4,1,8,7}
B = {2,3,6,5}
Output:
6
Explanation:
If we take the pairings as (1,2), (4,3), (7,5), and (8,6), the sum will be S = |1 - 2| + |4 - 3| + |7 - 5| + |8 - 6| = 6.
It can be shown that this is the minimum sum we can get.
Example 2:
Input:
N = 3
A = {4,1,2}
B = {2,4,1}
Output:
0
Public Test Cases:
Editor Panel
Cpp
Run
Test Public
Submit
#include <iostream>
#include <algorithm>
#include <cmath>
using namespace std;
int main() {
int N;
cin >> N;
Output:
Expected: 6
Got:
Time: 2957ms
Error: stdin.cpp:1:1: error: expected unqualified-id before numeric constant
1 | 4
| ^
chmod: cannot access 'a.out': No such file or directory
Test Case 2: ❌ FAILED
Input: 3


VirTA
Dashboard
Leaderboard
Store
About Us
Logout
prak123
Leaderboard
Your Rank
#1
prak123
Score
100
Top Performers
Rank
User
Score
Badge
#1
prak123
100
1
Total Students
100
Average Score
100
Top Score


Leaderboard
Your Rank
#1
prak123
Score
100
Top Performers
Rank
User
Score
Badge
#1
prak123
100
1
Total Students
100
Average Score
100
Top Score
P

Contact Us

We'd love to hear from you! Whether it's feedback, questions, or collaboration ideas — reach out below.

Get in Touch

Name

Your name

Email

you@example.com

Message

Your message...

Send Message

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Bhubaneswar, India

TEAM MEMBER

Satyam Subham Mohanty (Team Leader)
Suman Roy
Prakash Kumar
Pratyush Kumar Sio

TECH STACKS

Backend

- Node
- Express
- Socket.IO
- JWT
- bcrypt
- BullMQ
- redis
- Piston API

Frontend

- React 18
- Vite
- tailwindcss
- Framer Motion
- React Router
- Socket.IO Client
- Tabler Icons

CONCLUSION

The Digital Lab Grader project demonstrates how modern web technologies can simplify and enhance the academic grading process through an interactive, scalable, and user-friendly platform.I gained a deeper understanding of how the frontend and backend integrate seamlessly, how real-time systems work, and how clean design and logic can transform a complex process into a simple digital experience.Overall, this project strengthened my practical skills in full-stack web development and gave me valuable hands-on experience in building a complete, production-ready application.

THANK YOU