

# Competitive Programming Club Website



CLIENT:

Competitive Programming  
Club

TEAM: Tristan Braun, Tobias  
Bussiek, Connor Hill, Austin Lam,  
Kadin Matoek, Stephanie Thomas

## Agenda

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02	REQUIREMENTS
03	BUILD DESIGN
04	FRONT-END
05	USER SIGNUP
06	BACK-END
07	FUTURE PLANS

# PROJECT GOAL

Create a dynamic leaderboard website that tracks and displays stats from West Chester University Programming Club members

CODEFORCES

Sponsored by TON

HOME

TOP

CATALOG

CONTESTS

GYM

PROBLEMSET

GROUPS

RATING

EDU

API

CALENDAR

HELP

RAYAN

MAIN

ACMSGURU

PROBLEMS

SUBMIT

STATUS

STANDINGS

CUSTOM TEST

Standings

Users which have submissions in last two weeks are marked with green. Can be cached for several minutes.

#	Handle	Problems
1	Sparkle_Twilight	10216
2	Engineer	10008
3	maspy	9870
4	Traverser_Steal69	9569
5	chappy1	9534
6	your_submissions_	9209
7	vjudge3	8893
8	vjudge5	8884
9	vjudge1	8869
10	vjudge4	8869
11	vjudge2	8853
12	tasfiqulahmed28	8712
13	bkifhr8	8639
14	bkifhr10	8621

Explore

Problems

Contest

Discuss

Interview

Store

Register

or

Sign in

Premium

Back to Contest

Global Ranking

Total Participants: 677898

1

Miruu

26 contests attended

2

Neal Wu

51 contests attended

US

3

Yawn\_Seal

84 contests attended

4

小羊肖恩

107 contests attended

CN

5

何逊

146 contests attended

CN

# Client Requirements

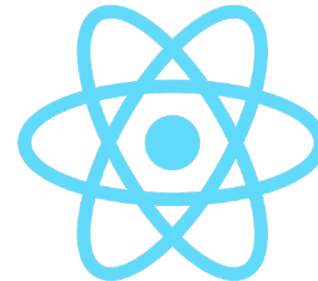
- Navigation Bar with:
  - Club Logo & Colors
  - Leaderboard View
  - Join Us option
- Leaderboard Table Displaying
  - Platform
  - Username
  - # Problem Solved
  - Ranking
  - Total Points
- Color Mode
  - Light & Dark

# Client Requirements: Backend

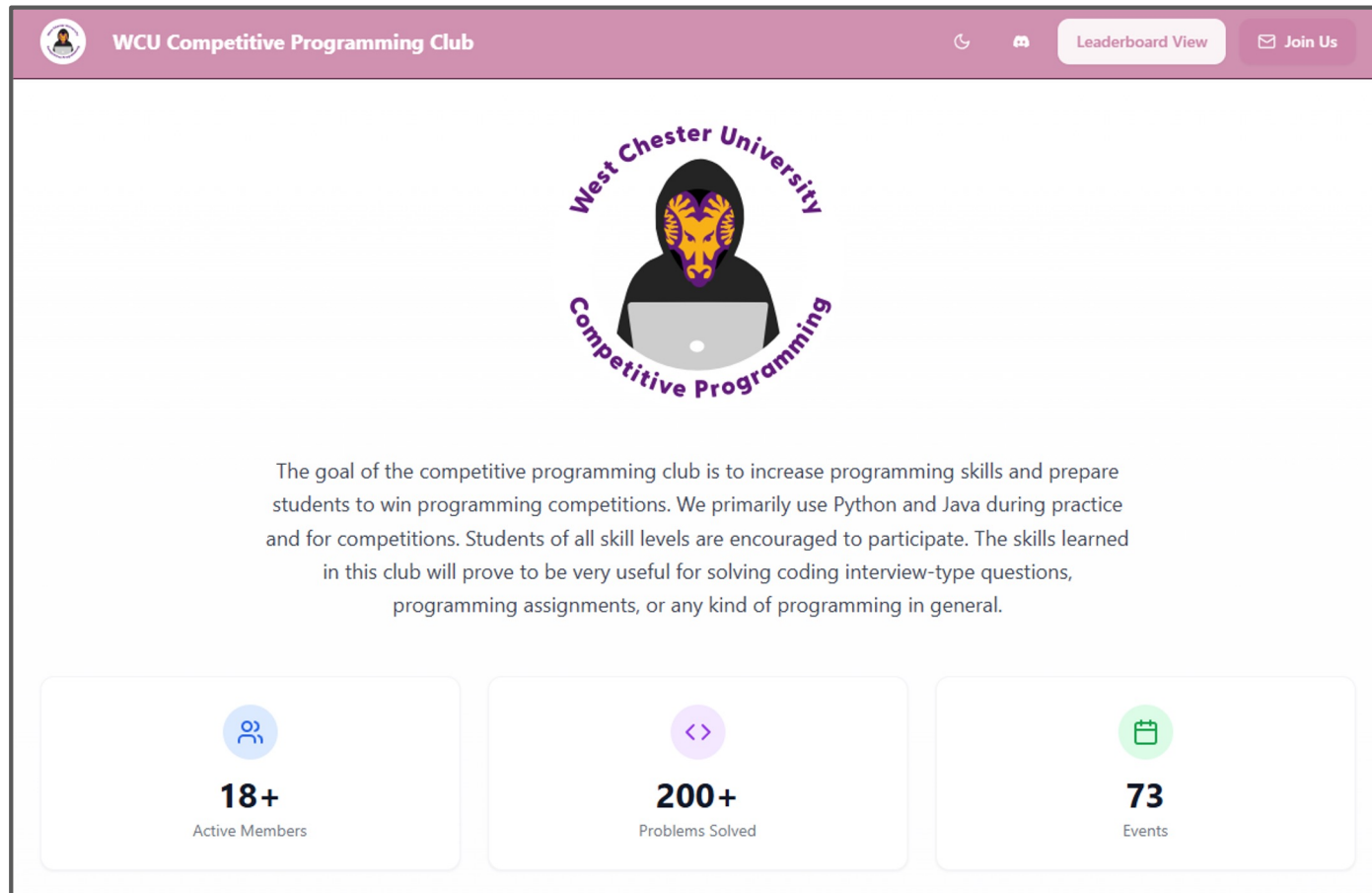
- WCU-Only Ladder Participants
- Self Sign-Up w/ Email Confirmation
- Easy to manage/Hand-over
- Real-Time Leaderboard
- Zero Cost Hosting
- Accessible to Alumni

# BUILD DESIGN

- Front-end: React.js, Typescript, HTML, CSS
- Back-end: Node.js
- Databases: MongoDB and Redis
- Integration: CodeForces and LeetCode APIs
- Containerization: Docker



# FRONT-END



# FRONT-END

## Our Team



**Mary Bauman**  
President



**Heather Cassel**  
Vice-President



**Christopher Calixte**  
Treasurer



**Nolan Prochnau**  
Secretary



**Linh Ngo**  
Advisor



**Catherine Emerick**  
Leadership Consultant

## Latest News



### 3rd Place at PACISE

Team Byte Me earned 3rd place at the PACISE coding competition this weekend!

4/5/2025



### 2nd Place at ICPC

West Chester University's Byte Me won 2nd place at the International Collegiate Programming Contest (ICPC) Wilkes University Division 1 Site!

11/15/2024



### 1st Place at CCSC Eastern




Team Byte Me won 1st place at the CCSC Eastern Programming Contest at Saint Mary's University!

10/18/2024




# FRONT-END



## Leaderboard View


Leaderboards		
> Codeforces		<> LeetCode
	<b>milisav</b> Rating: 2665	<b>2665</b> points
	<b>maomao90</b> Rating: 2660	<b>2660</b> points
	<b>prvocislo</b> Rating: 2401	<b>2401</b> points
4	<b>culver0412</b> Rating: 2370	<b>2370</b> points
5	<b>Alexdat2000</b> Rating: 2205	<b>2205</b> points
6	<b>Phantom_Performer</b> Rating: 2099	<b>2099</b> points
7	<b>hashman</b> Rating: 1754	<b>1754</b> points
8	<b>Acanikolic73</b> Rating: 1714	<b>1714</b> points
9	<b>Iarush</b> Rating: 1666	<b>1666</b> points
10	<b>MikeMirzayanov</b> Rating: 0	<b>0</b> points

	<> LEADERBOARD	
	>_ Codeforces	<> LeetCode
	Weekly Contest 445	
1	<b>millisav</b> Rating: 2665 <b>2665</b> points	<b>NarzullayevMe</b> 864 problems solved <b>#1</b> Place
2	<b>maomao90</b> Rating: 2660 <b>2660</b> points	<b>kmatotek</b> 306 problems solved <b>#2</b> Place
3	<b>prvocislo</b> Rating: 2401 <b>2401</b> points	<b>PurpleCrayon</b> 782 problems solved <b>#3</b> Place
4	<b>4</b> <b>culver0412</b> Rating: 2370 <b>2370</b> points	<b>4</b> <b>pandaforever</b> 174 problems solved <b>#4</b> Place
5	<b>5</b> <b>Alexdat2000</b> Rating: 2205 <b>2205</b> points	<b>5</b> s      4 problems solved <b>#5</b> Place
6	<b>6</b> <b>Phantom_Performer</b> Rating: 2099 <b>2099</b> points	<b>6</b> <b>DSA_is_Easy</b> 4 problems solved <b>#6</b> Place
7	<b>7</b> <b>hashman</b> Rating: 1754 <b>1754</b> points	<b>7</b> <b>boi7700899</b> 1454 problems solved <b>#7</b> Place
8	<b>8</b> <b>Acanikolic73</b> Rating: 1714 <b>1714</b> points	<b>8</b> <b>goAngelDiya</b> 0 problems solved <b>#8</b> Place
9	<b>9</b> <b>Iarush</b> Rating: 1666 <b>1666</b> points	
10	<b>10</b> <b>MikeMirzayanov</b> Rating: 0 <b>0</b> points	


# FRONT-END


 WCU Competitive Programming Club


  [Leaderboard View](#) [Join Us](#)



The goal of the competitive programming club is to increase programming skills and prepare students to win programming competitions. We primarily use Python and Java during practice and for competitions. Students of all skill levels are encouraged to participate. The skills learned in this club will prove to be very useful for solving coding interview-type questions, programming assignments, or any kind of programming in general.




**18+**  
Active Members

**200+**  
Problems Solved

**73**  
Events

Leaderboards

[Codeforces](#) [LeetCode](#)

	<b>milisav</b> Rating: 2665	<b>2665</b> points
	<b>maomao90</b> Rating: 2660	<b>2660</b> points
	<b>prvocido</b> Rating: 2401	<b>2401</b> points
<b>4</b>	<b>culver0412</b> Rating: 2370	<b>2370</b> points
<b>5</b>	<b>Alexdat2000</b> Rating: 2205	<b>2205</b> points
<b>6</b>	<b>Phantom_Performer</b> Rating: 2099	<b>2099</b> points
<b>7</b>	<b>hashman</b> Rating: 1754	<b>1754</b> points
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<b>9</b>	<b>Ianush</b> Rating: 1666	<b>1666</b> points
<b>10</b>	<b>MikeMirzayanov</b> Rating: 0	<b>0</b> points

# USER SIGNUP



- Sendgrid for email sending API
- Verification code for authenticating users

Leaderboard View Join Us

**Join Our Club**  
Enter your info to join the leaderboard

Email Address

LeetCode Username

CodeForces Username

Register

WCU Alumni? [Join here](#)

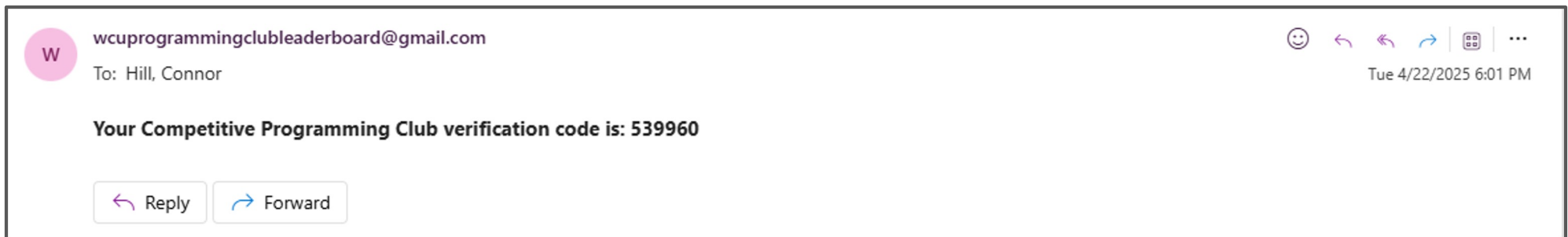
Leaderboard View Join Us

**Verify Your Email**  
Please check your email for a verification code.

Enter 6-digit code

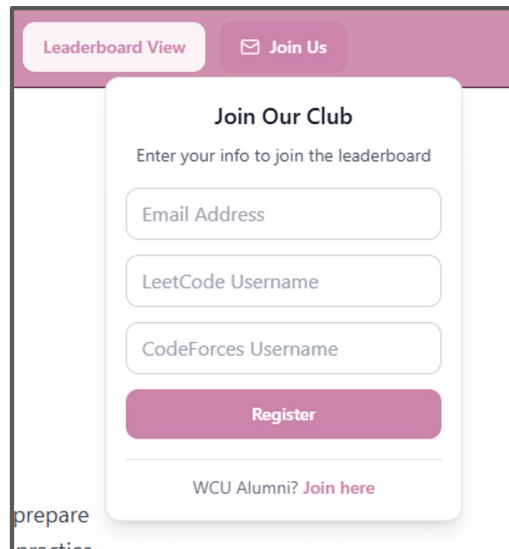
Verify

[Resend code](#)

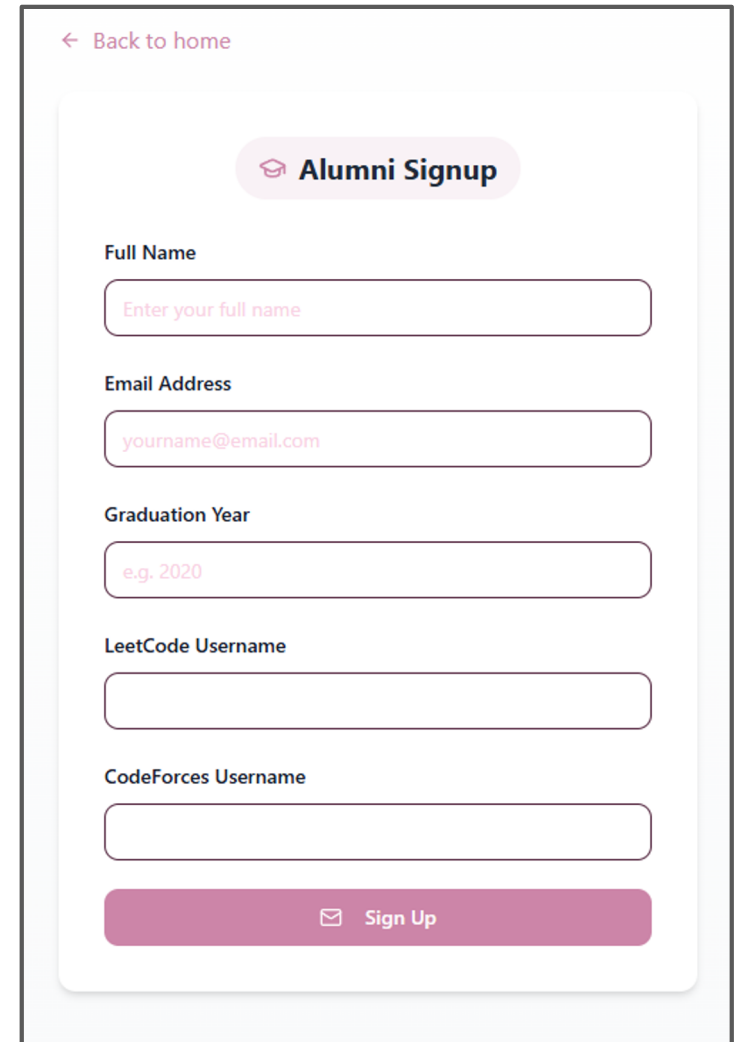


# USER SIGNUP

- Alumni sign up page
- Uses Sendgrid to send the application straight to board members



The image shows a web interface with a purple header bar. On the left, there is a button labeled "Leaderboard View". On the right, there is a button labeled "Join Us" with an envelope icon. Below the header, a white modal box titled "Join Our Club" is displayed. Inside the modal, the text "Enter your info to join the leaderboard" is followed by three input fields: "Email Address", "LeetCode Username", and "CodeForces Username". Below these fields is a purple "Register" button. At the bottom of the modal, there is a link that says "WCU Alumni? Join here".



The image shows a web interface with a purple header bar. On the left, there is a button labeled "Back to home" with a left arrow icon. Below the header, a white modal box titled "Alumni Signup" is displayed. Inside the modal, there are four input fields: "Full Name" (with placeholder text "Enter your full name"), "Email Address" (with placeholder text "yourname@email.com"), "Graduation Year" (with placeholder text "e.g. 2020"), and "LeetCode Username". Below these fields is a "CodeForces Username" field. At the bottom of the modal, there is a purple "Sign Up" button with an envelope icon.

DEMO

# BACK-END

## API's: LeetCode & Codeforces

### Codeforces API (via official Api)

**URL:** <https://codeforces.com/api/{methodName}>

- Fetches official user rating and rank directly from Codeforces
- Used for building our Codeforces leaderboard
- Lightweight and public, no authentication required
- Cached using Redis to reduce load

### LeetCode API (via our own hosted instance)

URL: <https://wculeetcode-api.onrender.com>

- Based on Unofficial [Alfa LeetCode API](#)
- Fetches:
  - Total problems solved
  - Overall ranking
  - Most recent contest result
- Used to build a leaderboard ranked by latest contest performance
- Cached using Redis to reduce load
- Severely rate-limited so had to deploy as a custom backend to avoid limits

# Hosting: Render

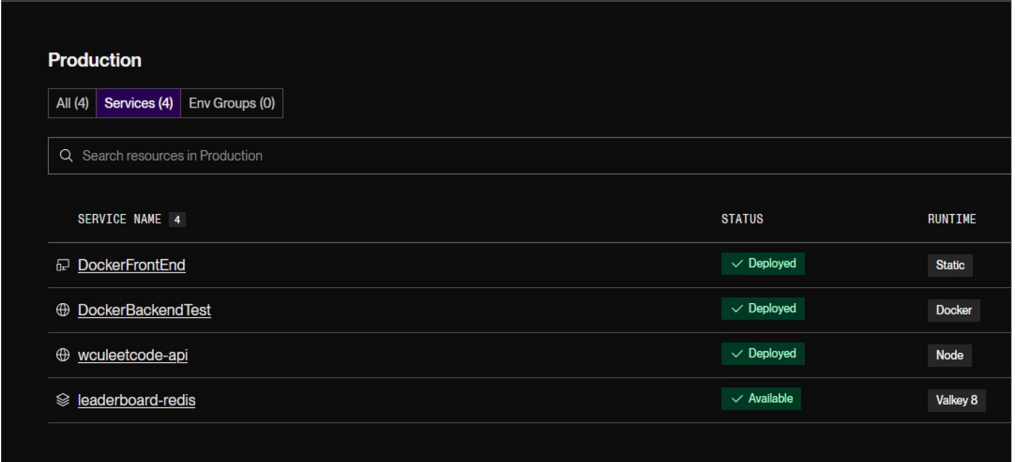
One-click GitHub integration

Easy to deploy both backend and frontend





Support for Full-Stack Apps

Free Tier meets our needs

Project is fully hosted



The screenshot shows the 'Production' environment dashboard in Render. It features a search bar and a table of services. The table has columns for 'SERVICE NAME', 'STATUS', and 'RUNTIME'. There are four services listed: 'DockerFrontEnd' (Static), 'DockerBackendTest' (Docker), 'wculeetcode-api' (Node), and 'leaderboard-redis' (Valkey 8). The first three are 'Deployed' and the last is 'Available'.

SERVICE NAME	STATUS	RUNTIME
 <a href="#">DockerFrontEnd</a>	✓ Deployed	Static
 <a href="#">DockerBackendTest</a>	✓ Deployed	Docker
 <a href="#">wculeetcode-api</a>	✓ Deployed	Node
 <a href="#">leaderboard-redis</a>	✓ Available	Valkey 8



# Database: MongoDB Atlas

Why MongoDB:

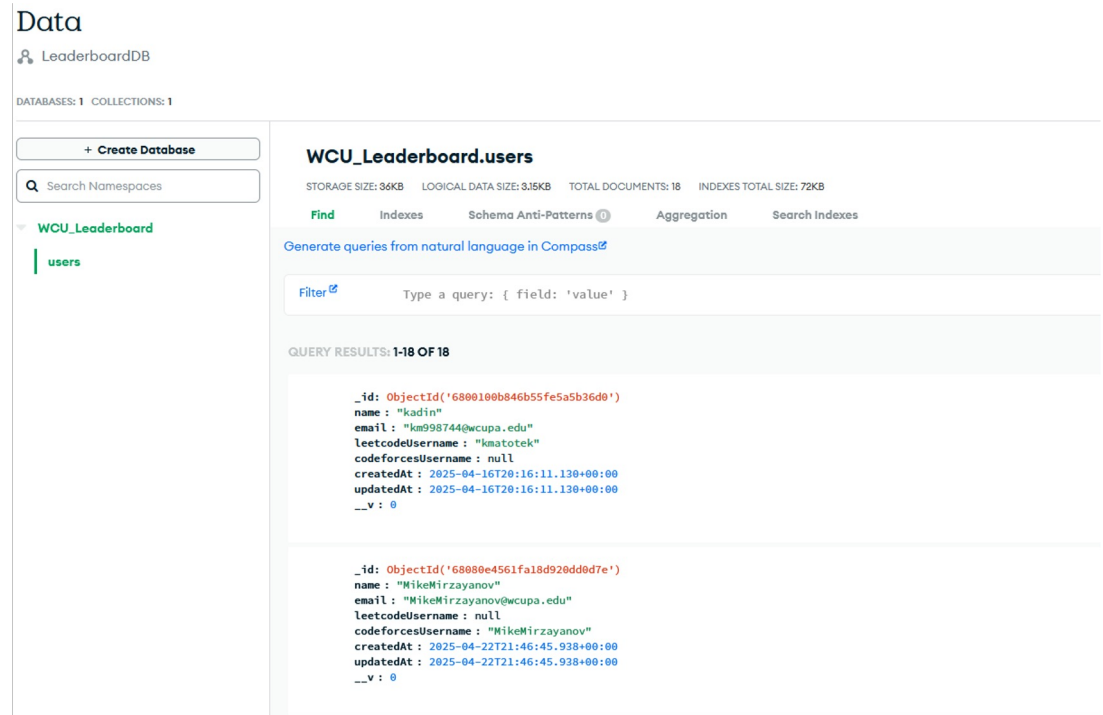
Simplicity, persistence, and easy cloud access without local setup.

Free tier meets our needs

Our Use Case: Store and view User's Name, WCU emails, Coding Websites Usernames

Allows Admin to edit, prune users

Progress: Fully implemented 



The screenshot displays the MongoDB Atlas web interface. On the left, the 'Data' sidebar shows the 'LeaderboardDB' database with one collection, 'WCU\_Leaderboard.users'. The main panel shows the details for this collection, including storage and index sizes. Below this, there's a 'Filter' section with a query input field. The 'QUERY RESULTS' section shows two documents from the collection.

**Data**  
LeaderboardDB

DATABASES: 1 COLLECTIONS: 1

+ Create Database

Search Namespaces

WCU\_Leaderboard

users

**WCU\_Leaderboard.users**

STORAGE SIZE: 36KB LOGICAL DATA SIZE: 3.15KB TOTAL DOCUMENTS: 18 INDEXES TOTAL SIZE: 72KB

Find Indexes Schema Anti-Patterns Aggregation Search Indexes

Generate queries from natural language in Compass

Filter Type a query: { field: 'value' }

QUERY RESULTS: 1-18 OF 18

```
{
  "_id": ObjectId("6800100b846b55fe5a5b36d0"),
  "name": "kadin",
  "email": "km998744@wcupa.edu",
  "leetcodeUsername": "kmatotek",
  "codeforcesUsername": null,
  "createdAt": 2025-04-16T20:16:11.130+00:00,
  "updatedAt": 2025-04-16T20:16:11.130+00:00,
  "__v": 0
}
```

```
{
  "_id": ObjectId("68080e4561fa18d920dd0d7e"),
  "name": "MikeMirzayanov",
  "email": "MikeMirzayanov@wcupa.edu",
  "leetcodeUsername": null,
  "codeforcesUsername": "MikeMirzayanov",
  "createdAt": 2025-04-22T21:46:45.938+00:00,
  "updatedAt": 2025-04-22T21:46:45.938+00:00,
  "__v": 0
}
```



# Database 2: Redis

## Why Redis:

- Super fast lookup speed
- Simple and versatile
- Custom TTL (Time to Live)
- Prevents API rate limiting

STRING

leetcodeLeaderboard

Key Size: 384 B   Length: 256   TTL: 835

Last refresh: < 1 min

Unicode

```
[{"username":"kmatotek","totalSolved":305,"overallRanking":"337678","contestRanking":"0","contestTitle":"Weekly Contest 445"}, {"username":"linhbngo","totalSolved":116,"overallRanking":"1017462","contestRanking":"14123","contestTitle":"Weekly Contest 445"}]
```

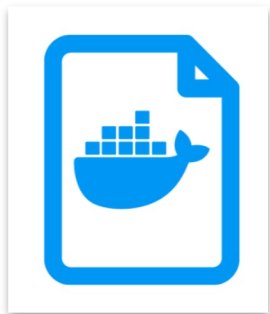
Total: 2		Last refresh: < 1 min		Columns
STRING	Codeforcesleaderboard			14 min
STRING	leetcodeLeaderboard			14 min

# System Architecture: Containerization



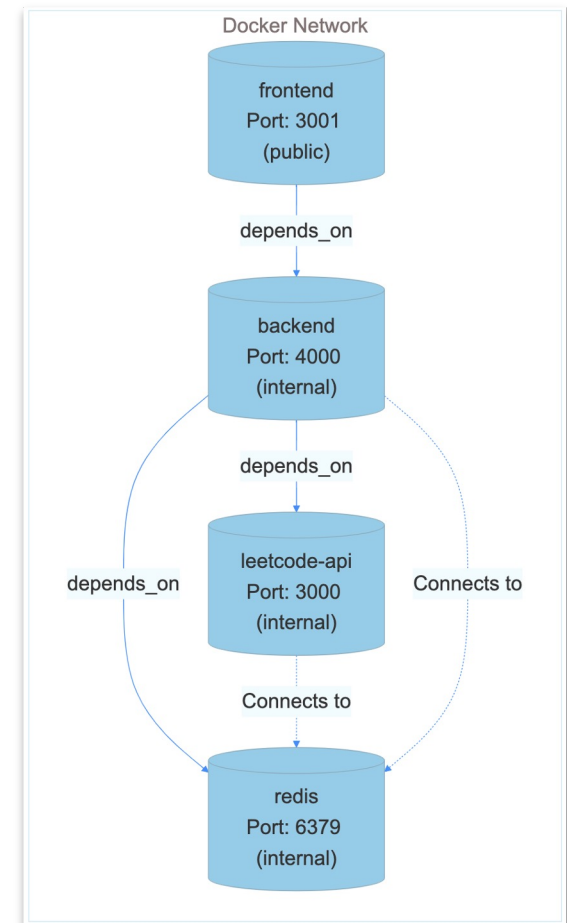
18

- Modular
- Simplified dependency management
- Portability (cloud)
- Simplified development and deployment



Dockerfiles:

- **Dev:** all ports exposed
- **Prod:** only frontend exposed



# Documentation

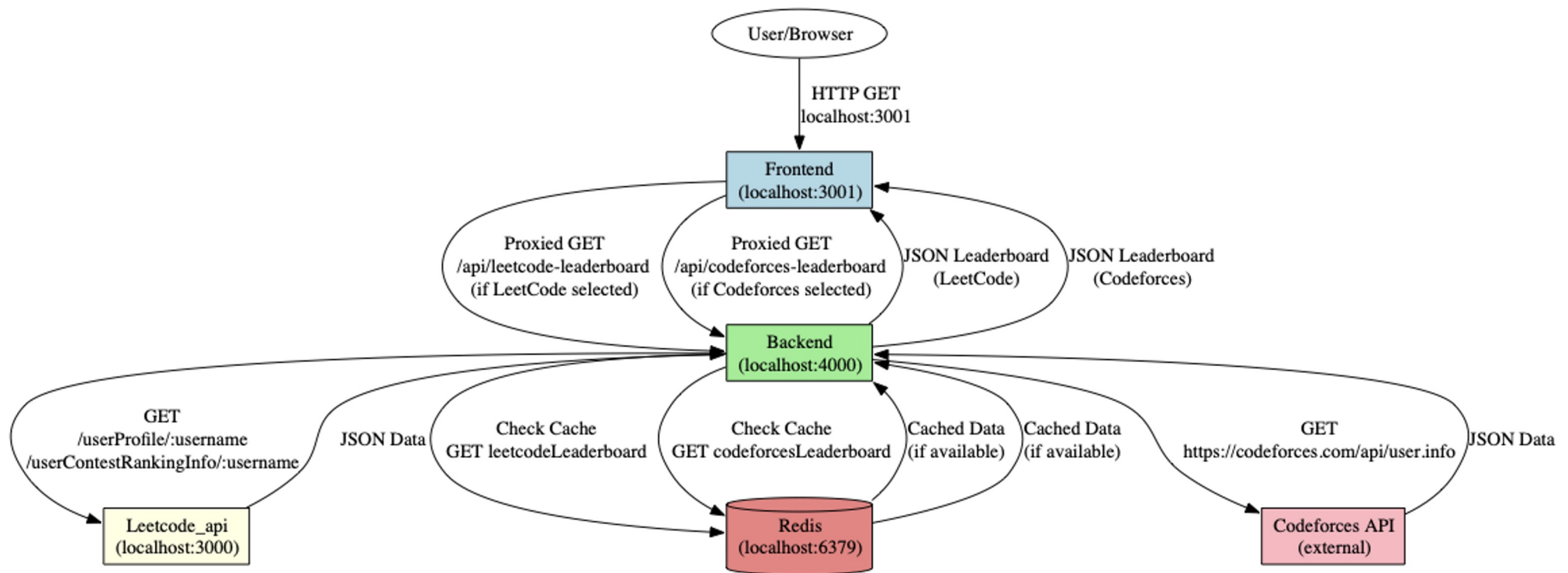
- External API
  - Leetcode
  - Codeforces
  - Usage
- Backend API
  - Signup endpoints
  - Leaderboard endpoints
  - Usage
- Docker
  - Purpose
  - Dockerfiles (Dev, Prod)
  - Usage

## 2. Leetcode Leaderboard Endpoint

- **Method:** GET
- **URL:** `/api/leetcode-leaderboard`
- **Description:**  
Retrieves a LeetCode leaderboard by obtaining user profiles and contest data from a secondary API, caches the result in Redis for 15 minutes, and returns the leaderboard with details like `totalSolved`, `overallRanking`, `contestRanking`, and `contestTitle`.
- **Test with Postman:**  
Send a GET request to `http://localhost:4000/api/leetcode-leaderboard` and confirm that the JSON response has the expected leaderboard structure.

- Frontend
  - Pages
  - Members/News configuration
  - Image formats

# Leaderboard Architecture



# What We Learned

- Client Meeting
- Adaptability
- Presenting Our Project
- Planning
  - Risks
  - Deliverables
- Working as a team

# FUTURE PLANS

- Update the site
- Bug Fixes
- Finalize Documentation
- Hand off project

Questions?