

Programming Contest Management Website

Courtney Bolivar

Ryan Stecher

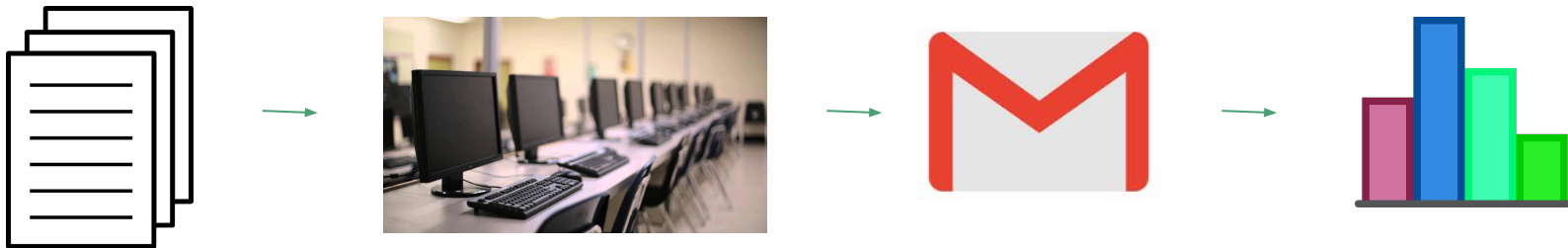
Andrew Wheeler

Yash Bhutwala

HQ

Motivation: Bucknell Spring Programming Contest

- Client: Professor Lea Wittie
- Previous contest set-up:



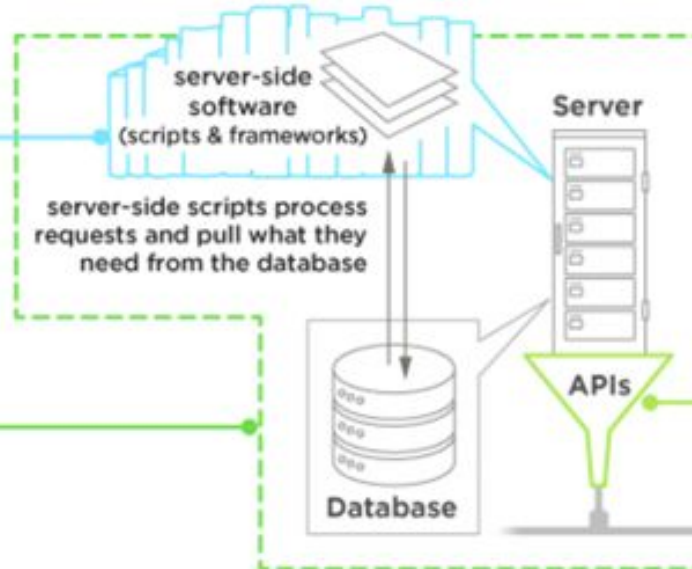
- Tedious, many moving parts
- Participants in China and Tulane limited

System Design



ExpressJS

MongoDB



HackerRank

THE FRONT END



Request
Response



External APIs and Libraries

- **HackerRank** - Allows users to submit source code, which is compiled and run against a list of provided test cases
- **CodeMirror** - Web-friendly text editor
- **bcrypt** - Interface for hashing passwords
- **jsonwebtoken** - An open, industry standard RFC 7519 method for representing claims securely between two parties
- **chart.js** - Create interactive charts for the web in JavaScript
- **simple-react-pdf** - A library that displays PDFs on the web

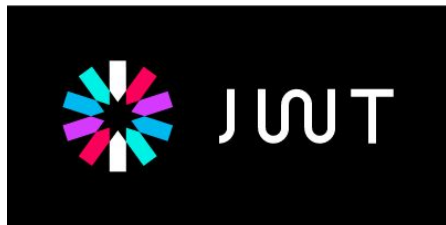


Chart.js

API Documentation

MongoDB Schema

Contests Document

```
_id: ObjectId('58f19bada2fc139e5de38f47')
cuid: "cj1iqn2kk0000a5mgd3oj0n16"
slug: "test"
name: "Test"
about: ""
rules: ""
admin: "admin"
▶ teams: Array
scoreboardVisible: false
▶ problems: Array
newMessage: "none"
▶ judges: Array
closed: false
▶ broadcastMessages: Array
__v: 3
start: 1492229082488
```

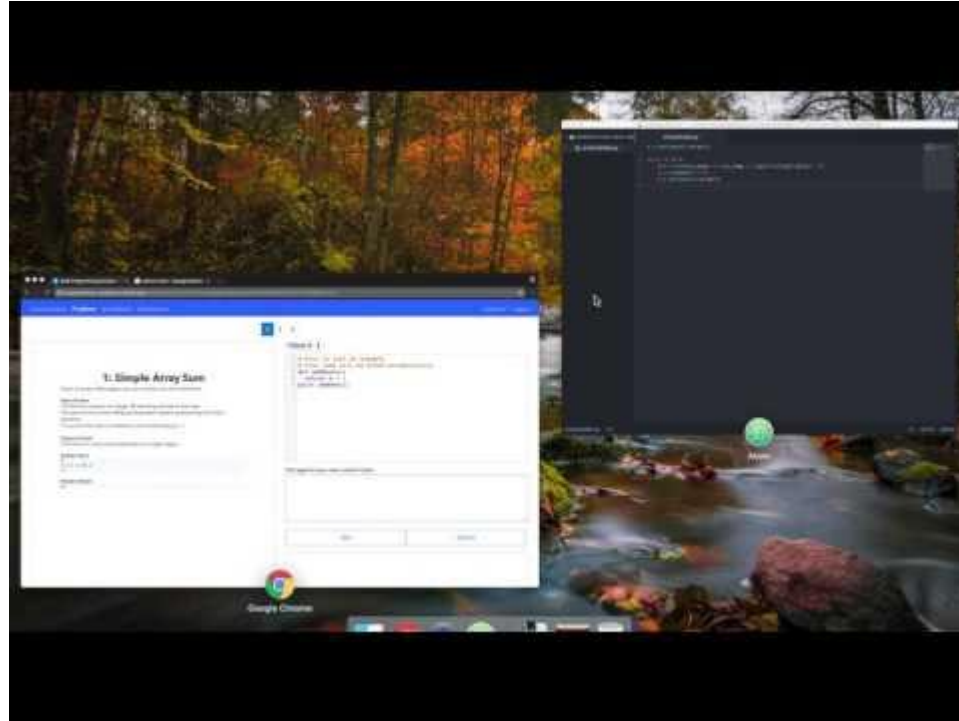
Users Document

```
_id: ObjectId('58f790bf7e9d535bb8d58254')
username: "user1"
password: "$2a$10$/MC3CKgAGhxC.runVP1Ef0r6hpssyG/026MJKdZdX/fQFUR3SW8U."
▶ participatedContestsID: Array
▶ createdContestsID: Array
loginAttempts: 0
__v: 2
```

Submissions Document

```
_id: ObjectId('58ee7cc7a7248e56eae6d1f2')
cuid: "cj1fcvj6w0000qhmej7071p9t"
teamName: "test"
teamID: "58ed2af418b658787df6ccdc"
contestID: "cj1dxb4f40000stmefgyykokh"
problemName: "Problem 1"
problemNumber: 0
hadStdError: false
correct: true
expectedOutputFileName: "BJoicjcal.txt"
actualOutputFileName: "r1JA3g2pe.txt"
feedback: "Correct"
code: "# Your code will be saved automatically
      def addOne(x):
        return x + 1
      print addOne(1)"
__v: 0
```

Video Demonstration



Reflections

- Challenges
 - Steep learning curve for *proper* web development
 - Following scrum when not familiar with how to break down tasks
- Results
 - Streamlined the contest completely
 - Classroom application
 - 203 Labs
 - Classroom activities, homeworks
- Future improvements:
 - Add multiple users on a team
 - Add multiple users as judges
 - Add support for logic (non-programming) problems
 - Integrate user signup/login with Google

Thanks to...

Professor Wittie for presenting us with this project and for being a great client.

Professor King for helping us successfully bring this website to completion.

And lastly, to our senior design class for helping test our system.