Project Excelsior

Learning the tools you need to create a project that will accelerate your career.

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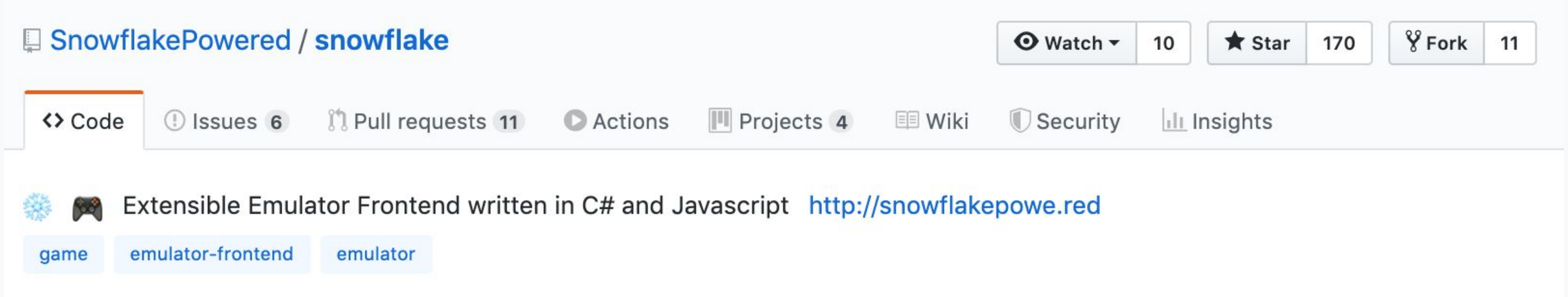
Why is it worth your time? Projects

- Learn and explore different applications of technologies!
- Craft projects that can potentially impact hundreds and thousands of people!
- Get involved in the Open Source Community and learn how to contribute to pre-existing codebases
- **Stand out from other computer science students!**



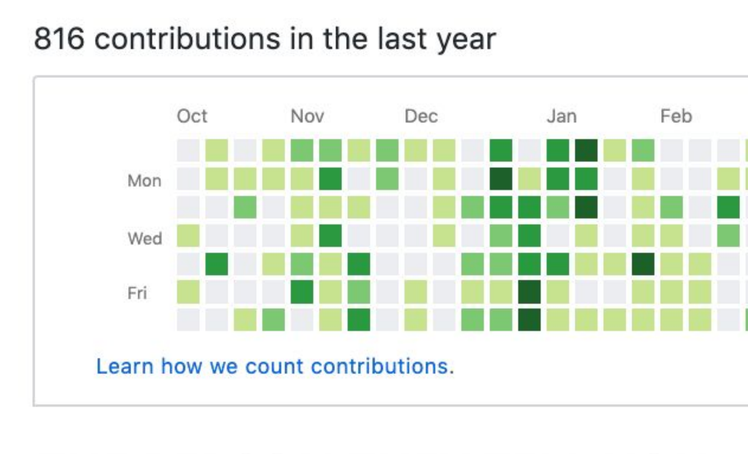
What are employers looking for? Projects

Employers want to hire the best students - you can stand out by showing:

- Initiative
- Creativity
- Passion for the field
- Ability to collaborate
- Additional Skills
- Involvement in the community

Developing personal projects helps you stand out a lot in this regard!

YOU



THE PERSON THEY TELL YOU TO NOT WORRY ABOUT

The Steps
How Do I Start?

1. **FIND A PROBLEM**
   - Your project will be the solution
   - It has to either save time, money, or improve upon pre existing processes
2. **Figure out what a user needs**
   - User Stories
     e.g. An Admin needs a dashboard to delete users
3. **Wireframing**
   - Make a general
   - Designing Low Fidelity and High Fidelity Designs
4. **Systems Architecture**
5. **Figuring out a software stack**
6. **Implementation**

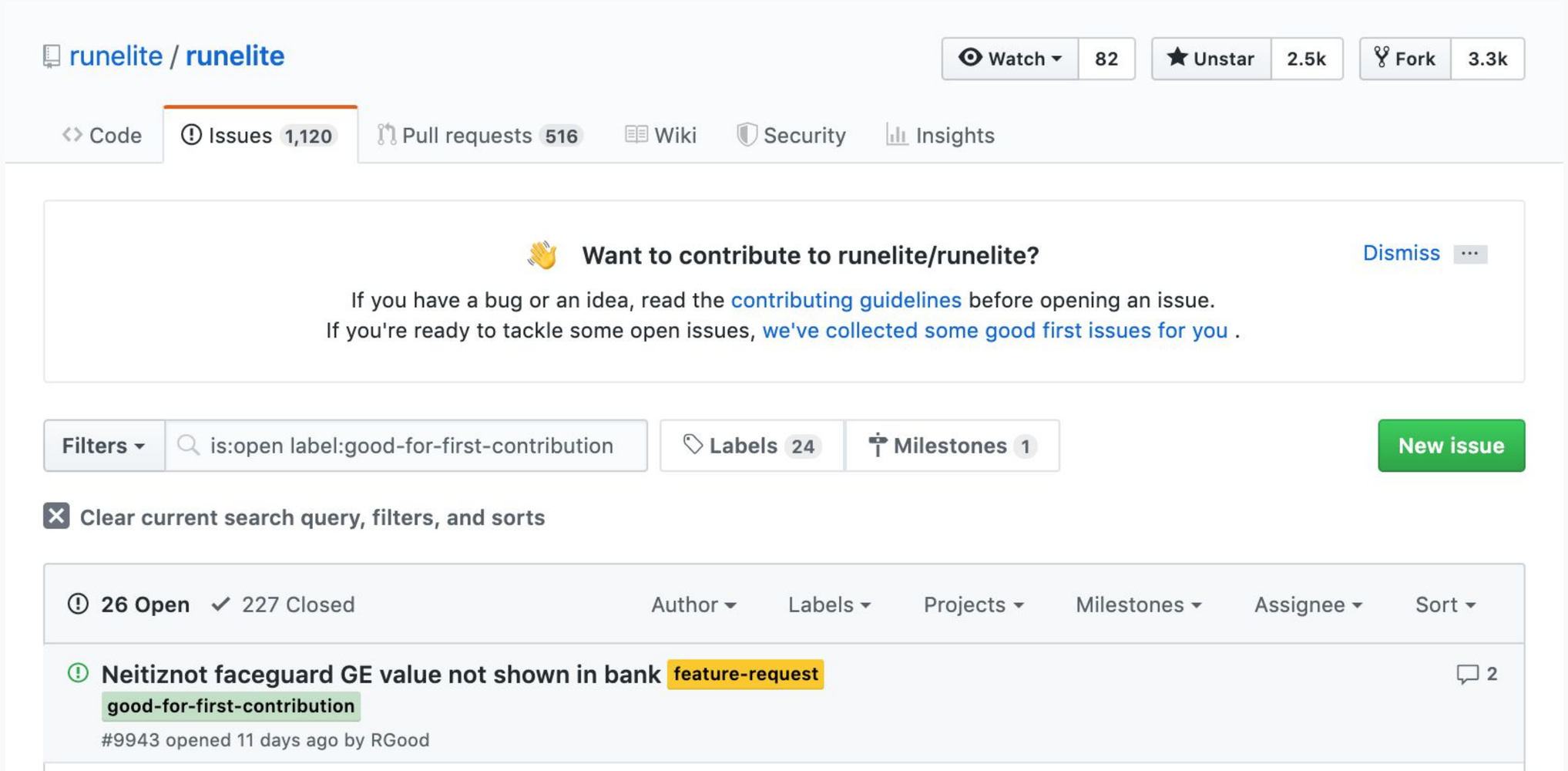
Open Source Contributions

Is it difficult to come up with a project idea? Why not choose to explore **Open Source Projects** instead?

These are community maintained software projects that welcome everyone to contribute! You can do everything from bugfixes to feature development, and contribute to some awesome stuff that you probably use daily!

Some great open source projects:
- Visual Studio Code
- Tensorflow
- Kubernetes
- ...and more!

Open Source *RuneLite*



A stack
How Do I Start?

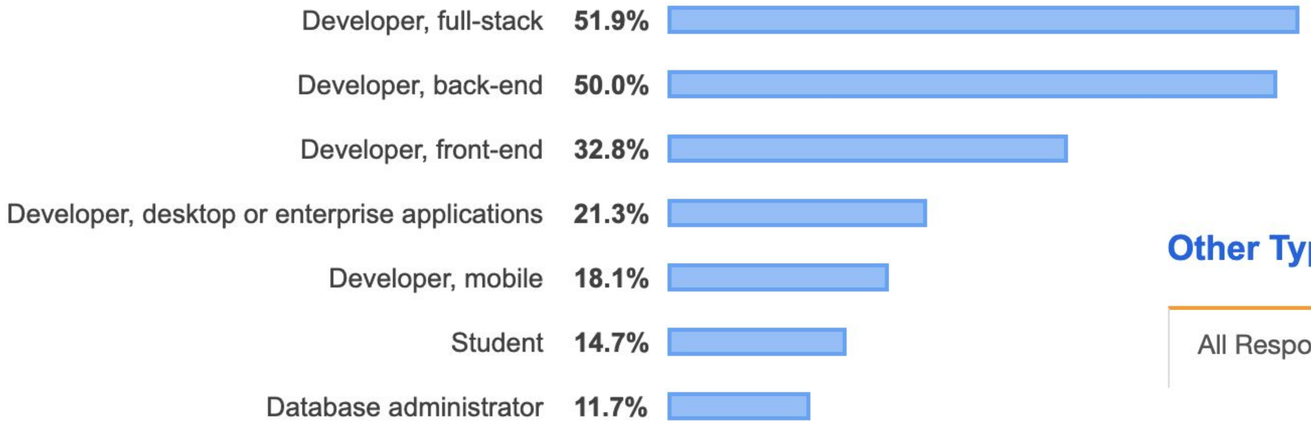
A software stack is a collection of independent components that work together to support the execution of an application.


JS HTML CSS
php
C++
C++
XML
MathWorks
React
perl
python
C++
C#
Scala
Java
JS
MySQL
hadoop
GRUNT
JS
Swift
ATOM
mongoDB
.NET
Visual Studio
github
SOCIAL CODING
node
I ♥ code
git
redis
Spark summit
scala
Kotlin 1.1
language for JVM, Android & JS
docke
C++
Lua
open hardware
YEOMAN
Ruby
Centos
{less}

Developer Roles

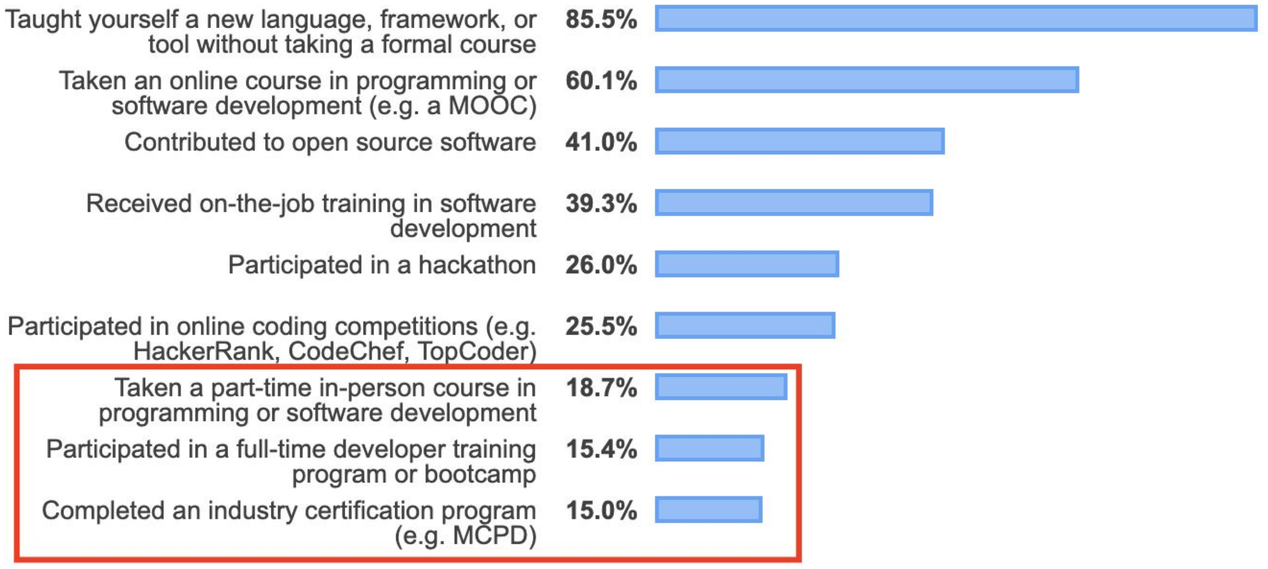
Developer Type

All Respondents | United States Unweighted | United States Weighted by Gender



Other Types of Education

All Respondents | Professional Developers



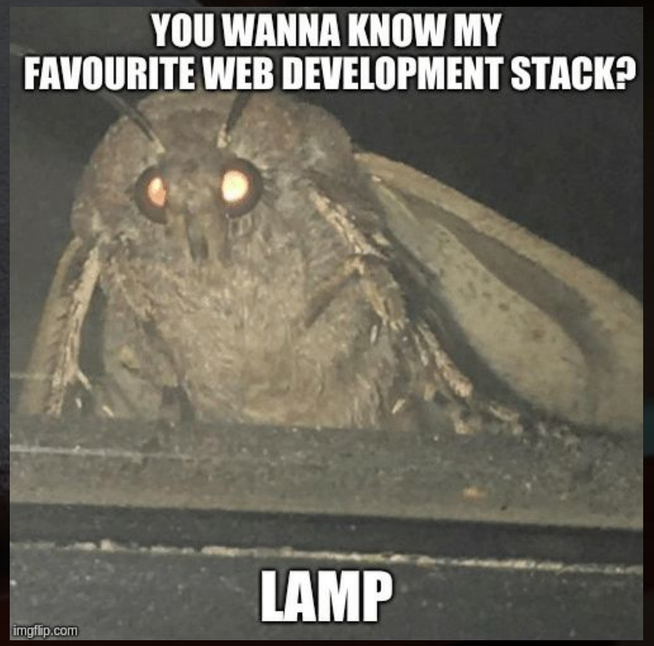
Weeb Development

Types of Apps
Web Development

- **Static Web Apps:** Web applications which have little to no interactivity, meaning next to no JavaScript). Usually not responsive either.
- **Multi Page Apps (MPA):** Where logic is almost all on the server, and pages are created by the server as well. Good for security.
- **Single Page Apps (SPA):** Web applications which work off of a single HTML file. Good for responsiveness.
- **Progressive Web Apps (PWA):** Web applications which uses a service worker which allows for running offline and even installing on a phone.

Le Stack
Web Development

- **Backend:** This is the application which connects the frontend to the database which can be created with a wide range of languages such as Node, Java, C++, etc.
- **Frontend:** The forward facing application which users interact with. This can be separate from the backend, or integrated as a MVC.
- **Database:** The storage of persistent data for everything which can be SQL, for data consistency and integrity, or noSQL for speed and scalability.



Frontend
Web Development

- **Why web development:** The web is growing as browsers get more and more powerful. As web technologies can cover static sites to desktop apps.
- **Before:** HTML/CSS/JS on your favourite editor, while refreshing your index.html file on the browser.
- **Now:** Setting up a development server, picking packages out of thousands, setting up CI/CD, configuring bundler, ...

Frontend Stacks
Web Development

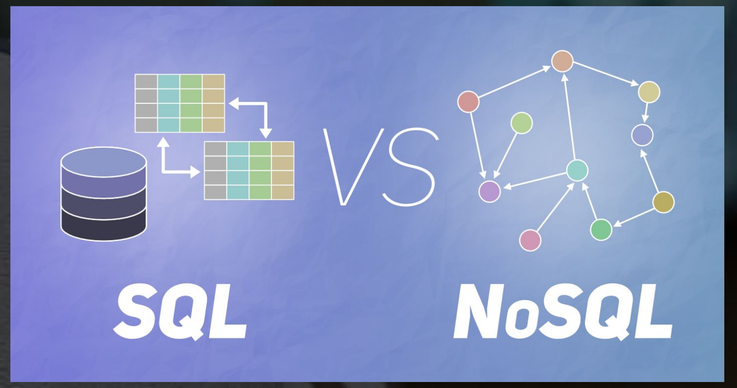
- **HTML/CSS/JS:** The basics of web development, the stack which everyone should know and try at least once in their life. Good for learning/classroom environment.
- **Jekyll, Gatsby, Hugo:** Static site generators using various languages for templating static data. Good for display dynamic data such as a personal website.
- **React, Angular, Vue:** Dynamic sites where the page is generated on the browser. Good for when there is a lot of data/logic such as dashboards, or large complex forms.

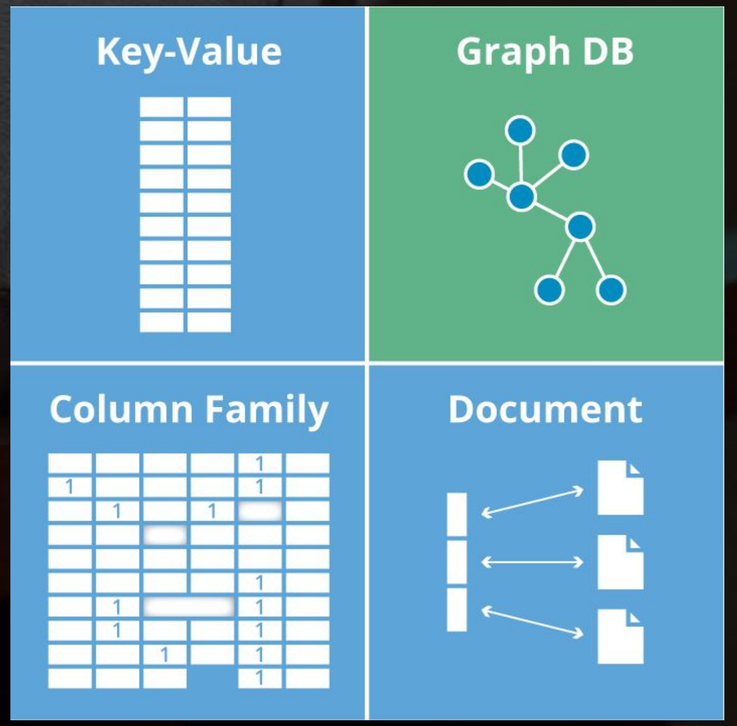
Backend API Stacks
Web Development

- **Beginner Friendly**
  - **Node.js**
  - **Rails**
  - **Django**
- **Advanced**
  - **Go Lang**
  - **Spring Boot**

Backend Databases
Web Development

- **SQL**
  - **In the form of a table, Fixed Schema**
  - **Data Integrity and Complex Queries**
  - **noT WeB ScAle**
- **NoSQL**
  - **Graph (Nodes and Edges), Dynamic Schema**
  - **Rapid development**
  - **Highly scalable (If done right)**
  - **Generally faster for short and small queries**





Send Jobs
Web Development

- **Front-end developer:**
  - Knowledge of JavaScript Frameworks (React, Angular)
- **Back-end Developer:**
  - Knowledge of Databases
  - CRUD applications and REST APIs
- **Full-stack developer:**
  - A bit from both

Mobile Development

Types of Development
Mobile Development

1. Do I need to interact with hardware?
2. Do I need my app to have consistent native performance on either platform?
3. Do I need my app to have a small file size?
4. Do I need to build an app fast?
5. Does my app need to run on both platforms?
6. Does my app mostly use web technologies?
7. Am I ok with "fast as native" performance?

Types of Development

- **Traditional:**
  - Questions 1-3
- **Cross Platform:**
  - Questions 4-7

Traditional
Mobile Development

- **Android - Kotlin/Java:**
  - **Use Kotlin**

- **iOS - Swift/C#:**

  You must use a Mac in-order to develop iOS application

Cross-Platform Mobile Development

- **React Native**
  - Closer to a web development style than traditional development
  - Has a JavaScript translator in the application to run natively
- **Flutter**
  - Same as traditional development
  - Compiles to native code
  - Mostly just used for UI in the industry

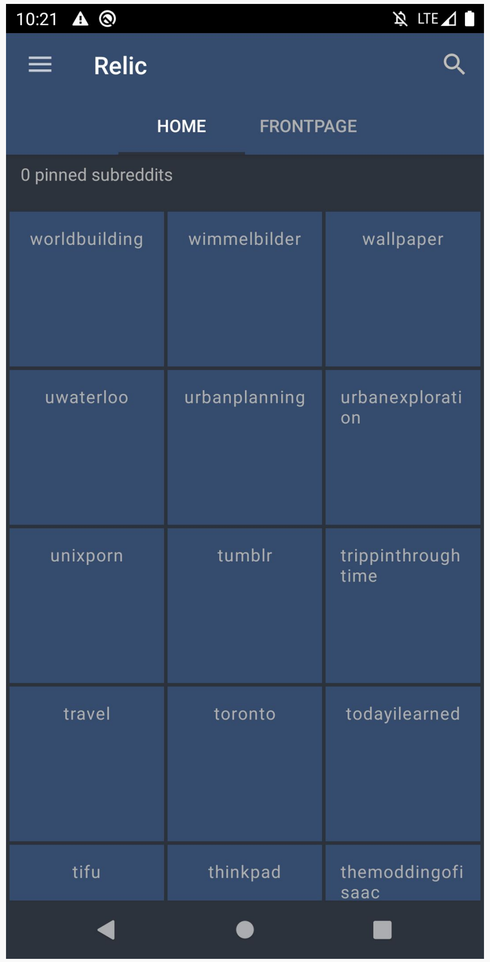
Send Jobs
Mobile Development

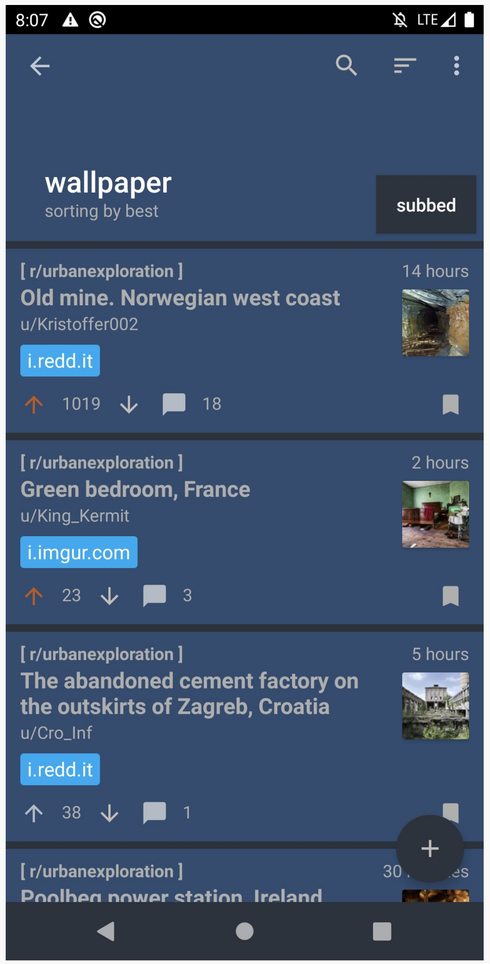
- **iOS developer:**
  - Swift skills
- **Android Developer:**
  - Java Skills
  - Templating
- **React Native Developer:**
  - React Skills
  - Web Development

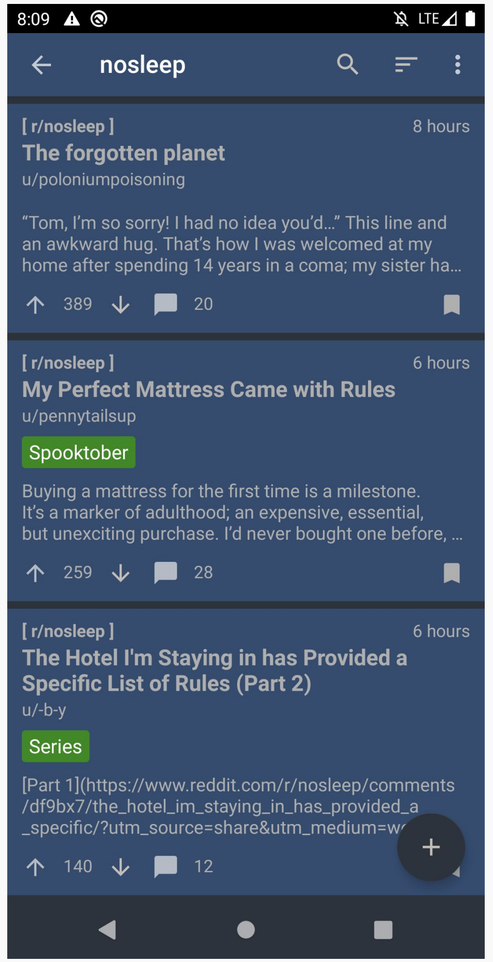
UTSC Student Project
Relic

An offline-first Reddit Client

- Learn Android development and expose himself to various architectural and design techniques
- Wanted to build a Reddit client that was tailored specifically to the way I used Reddit



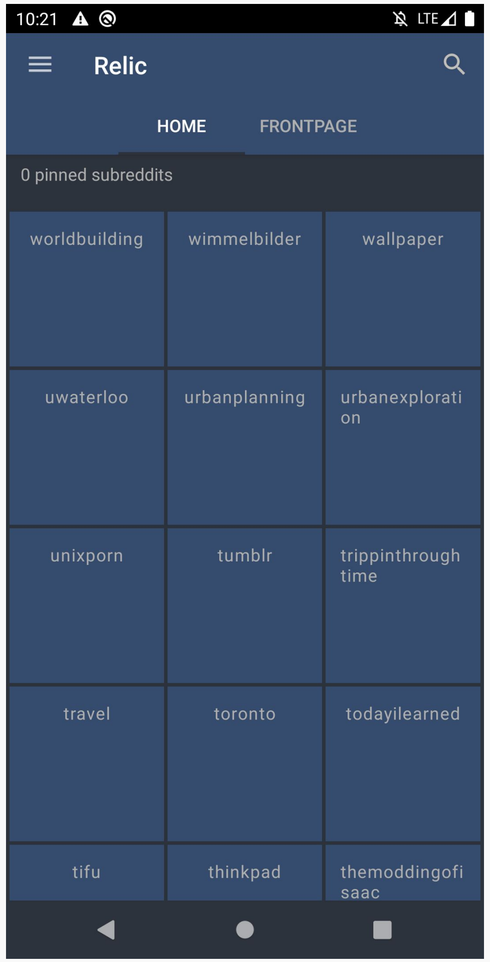


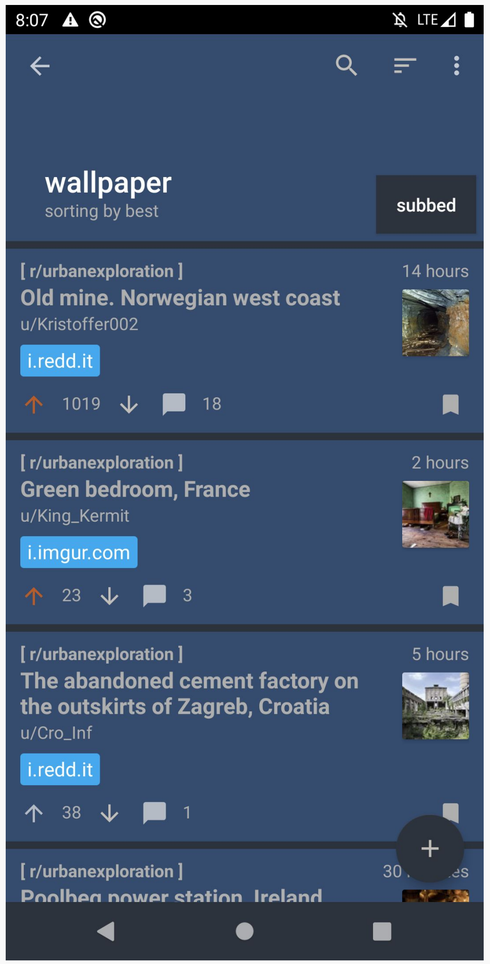


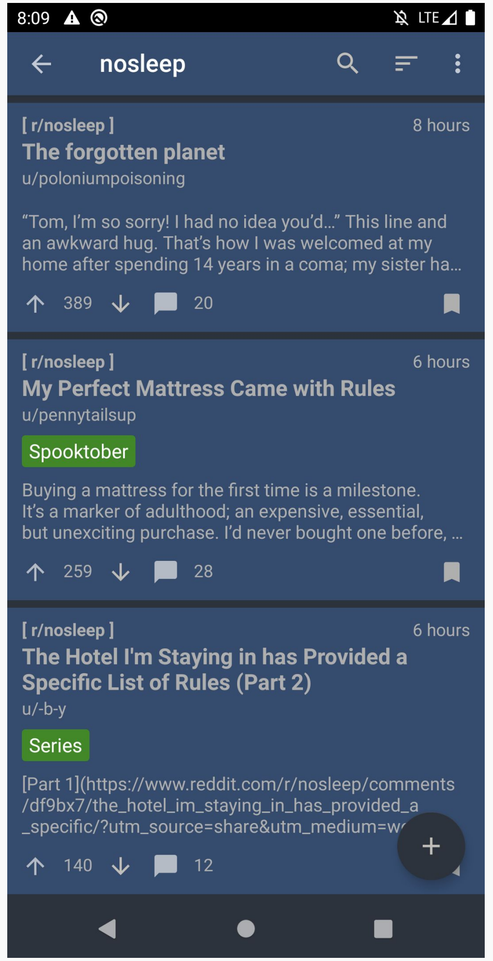
UTSC Student Project Relic

Problems solved

- I spend a lot of time without wifi
- I wanted to put the features I used most often at hands reach
- Focus on content.
- Search that takes into account locally stored data.







CSEC
Excelsior Program

Open Source + Cool New Tech =
Impactful Portfolio

- **Learn as you go:** We would provide office hours to provide mentoring to ensure you make quality rather than quantity code
- **Made for you:** Have a specific technology in mind? Request a workshop and we can learn it together
- **Made with meaning:** We have milestones to check on progress to help keep you on track throughout the program

CSEC Excelsior Program

The Workshops

- **MLH Localhost:** Provided by Major League Hacking, learn how to create and deploy your first website using Node.js and Heroku.
- **Intro to React:** Learn the basics to one of the most popular front-end frameworks from state to creating your first application.
- **Intro to Gatsby:** A static site generator based on React for creating blazing fast applications with SEO.
- **And more...**

CSEC
First Year Impact Project

Build a blog-style web application to help 200 immigrants share their stories.

- Azhar Laher, a Secena Business Professor, has being collecting these stories over the last few months.

First Years need to have a significant and meaningful project to shine.
What you will learn:

- React and Gatsby
- Project Structure
- Deployment
- Software Engineering Practices

A partnership between CSEC and a non-profit startup, Pear, that connects students to meaningful NGO projects.

Sponsored and supported by:

- Department of Computer and Mathematical Sciences
- 

- Azhar Laher

Thank you for contributing over a total of **$200** in prizes.

CSEC
Project Excelsior

Want to start work on your own personal projects? Get involved with the Excelsior Initiative and find like-minded colleagues!

We plan to categorize students into three teams:

Platform Teams

Research Teams

Startup Teams

Join the CS Discord, we can organize project teams in the new **#projects** channel! https://discord.gg/**Qwvu5gf**

Questions?


CSEC
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