

Introduction

With AI, we're living in strange times. Assignments like these can be built by many people now. There is still some value in putting them out, though.

Go through this document and you'll understand why this assignment exists (and what it is). But before that, what is Fermion?

~~Fermion is a subatomic particle with half-integer~~ Fermion is a SaaS platform for business owners who are looking to build their online education business. Boring problem statement, but our vision is huge.

I am Mehul, founder of Fermion. (who is also writing this assignment for you).

With Fermion, we're building AWS for ed-tech use cases. After running Codedamn for years and scaling it to \$500K in revenue, we realized that we are building for the wrong industry. Ed-tech is not a market I am passionate about, as a founder, to solve. Ed-tech, to a very large extent, is more about branding, marketing, and packaging of your outcomes/content than the core technology itself.

Technology is not what drives revenue for an ed-tech company, but it sure is an extremely important piece of their business. It's the "boring" side of the business. And we want to capture that side, for every ed-tech company on the planet.

With Fermion, we're helping businesses not overinvest their time/energy on this boring (but critical) part, but rather use it to expand and capture their respective markets.

Assignment

Alright, let's get to the assignment. Here's what you have to build:

- A small full-stack application
- 2 pages
- Page 1: `/stream`
- Page 2: `/watch`

User journey:

- User 1 opens `/stream`. They are able to turn on their camera/microphone
- User 2 opens `/stream` (say in incognito tab). They are able to turn on their camera/microphone as well. User 1 and 2 are connected with each other using WebRTC (imagine both of them are in a Google meet)
- User 3 opens `/watch`. User 3 is able to see user 1 and 2 interact with each other, but as a live HLS playback (like YouTube live).

That's it. This is the assignment. A few important points to note here:

1. Do not use blackbox solutions like LiveKit to solve this.
2. You do not have to write your own SFU for WebRTC. Use a solution like Mediasoup or any other of your choice.
3. The app should be functional locally. You do not need to deploy it online (bonus marks although, if you can)

Why this assignment?

I'm sure you can build this assignment with AI tools. Then why have it in the first place? Firstly, because it'll filter out people who actually can build stuff, compared to those who can only comment "interested" under job openings.

Secondly, post this assignment, you'll have a call with me, where I will sit for 30-45 minutes with you on the code you wrote yourself, and we'll go very deep into the internals of your tools (not WebRTC, etc) and the practices/choices you made.

If you're someone who can build full app end to end, and justify everything you have done and modify things as required, this is a great start.

What will happen in the post-assignment interview?

1. Node.js/TypeScript internals
2. Your application source code and choices made
3. Discussion around system design/improvements and implementation practices
4. How we'd take it to production, constraints at scale, etc.

We will not do a huge deep dive into WebRTC internals in the interview call. You should still, however, learn about how WebRTC and SFU work on a broader level.

What tools should I use?

Please consider using these (since they match with the stack we have at Fermion):

- Node.js/TypeScript throughout (mandatory)
- Next.js
- Custom SFU (mediasoup, etc.)
- FFmpeg for HLS transcoding
- PostgreSQL (if required)

You do not have to develop features like chat, login/signup, etc. Just build the core application.

I'm done, what's next?

Email me your application code on GitHub + a small product demo video (1-2 minutes) on mehul@fermion.app

I'll get back to you and schedule a demo

FAQs (based on what people asked on twitter)

> is this for full time role or for intern?

This is for full-time. If you're really cracked and want to join as an intern (because of college, etc.) - you can still complete the assignment and apply. But my preference is for a full-time hire first before any intern.

> what is the deadline?

deadline is asap.

i'll schedule calls as soon as i get emails and hire someone who passes rounds (and of course update the status that role is closed)

it is hard to pass interview call round with me, i grill hard. i haven't finalized anyone in the last 40 days

I have more questions

Tweet to me publicly on <https://x.com/mehulmpt>, and I'll address