

Tracer

Tracer is a COVID-19 contact tracing application designed for patients (users) to self-report their visited locations. If a patient has caught the COVID-19 virus they can report an exposure, then all users at shared locations within a week of that exposure are alerted.

Tech stack

This app is decoupled, meaning the frontend, backend, and database of the application can live independently. However, instead of putting the frontend and API subdomains into separate repositories it made more sense to consolidate them. The app also uses the Google Maps Geocoding API and provides the ability for a user to populate the latitude/longitude data based on the location name/address.

Backend

- [NodeJS](#) - This project was built using Node v16.13.0
- [NestJS](#) - NestJS is a NodeJS framework that fully supports TypeScript and uses Express under the hood
- [TypeORM](#) with MySQL - NestJS has TypeORM support, which allows one to use object-relational mapping as a way to interact with a relational DB without having to use SQL directly.

Frontend

- [AngularJS](#) - The project was built using Angular v13.0.1
- [Angular Material](#) - Angular Material is Material design applied to AngularJS. It contains a myriad of components and style options for an elegant user experience.

Startup (Initialization)

Prereqs

1. You'll need [NPM](#) to install dependencies and launch the API
2. You'll also need [Angular CLI](#) to launch the UI
3. You may want to configure the JWT secret in *api/src/auth/constants.ts*

API (NestJS)

1. Navigate to the *api* folder
2. Run *npm install*
2. Run *npm start* (prod) or *npm run start:dev* (dev) to launch the API
5. The API will be available at <http://localhost:3000>

Database (MySQL)

1. Configure the database options in *api/src/config/constants.ts*
2. This project has been tested and works with MySQL (results may vary with others)
3. Ensure your MySQL server is running

Frontend (AngularJS)

1. Navigate to the *api* folder
2. Run *npm install*
2. Run *ng serve* to launch the UI
5. The API will be available at <http://localhost:4200>

Google Maps (Geocoding) API

1. Set up a Google Cloud Platform project (if you don't have one already)
2. Generate a Geocoding API key (if you don't have one already)

Configuration

Go into *frontend/environments* and update:

- *frontend/environments/environment.ts*

- `frontend/environments/environment.prod.ts`

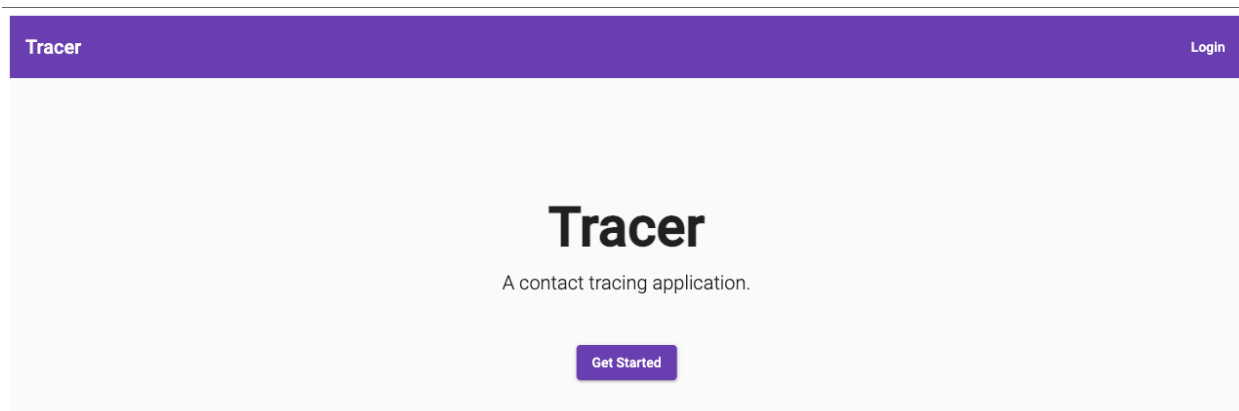
These files contain configuration information for both the Tracer API and the Google Geocoding API. In development, the Tracer API will point to `http://localhost:3000` (default URL).

The `environment.ts` files will look like this (image below). Replace `GEOCODING-API-KEY` with your API key.

```
Practicum > Tracer > frontend > src > environments > TS environment.prod.ts > ...
1  export const environment = {
2    production: true
3  };
4
5  export const apis = {
6    tracer: {
7      url: 'TRACER-API-URL'
8    },
9    google: {
10     geocoding: {
11       url: 'http://localhost:4200/api/geocode',
12       key: 'GEOCODING-API-KEY'
13     }
14   }
15 };
```

Splash Page

By clicking "Get Started" or "Login" a patient can create an account if they do not have one already.



Home Page (User 1)

Once logged in, the "Home" page shows a patient's profile information in addition to whether or not they've been exposed to COVID-19. Patients can also click "Update Info" or "Change Password" to make changes to their accounts.

The screenshot shows the Home Page of the Tracer application. The top navigation bar is purple with a hamburger menu icon, the text "Tracer", and a "Logout" link. Below the navigation bar are three tabs: "Home" (selected), "Locations", and "Exposures". The main content area is divided into two sections. The left section, titled "Profile", shows account information: "Acct created on Dec 7, 2021", "Name: John Doe", "Phone: 444-444-1234", and "Email: john.doe@gmail.com". Below this information are two buttons: "Update Info" and "Change Password". The right section, titled "Exposure Status", displays the message: "You haven't been exposed at any events."

Locations Page

Patients can add previously visited locations to the "Locations" page. This will create the location in the database and record all patients who have to the location on that day.

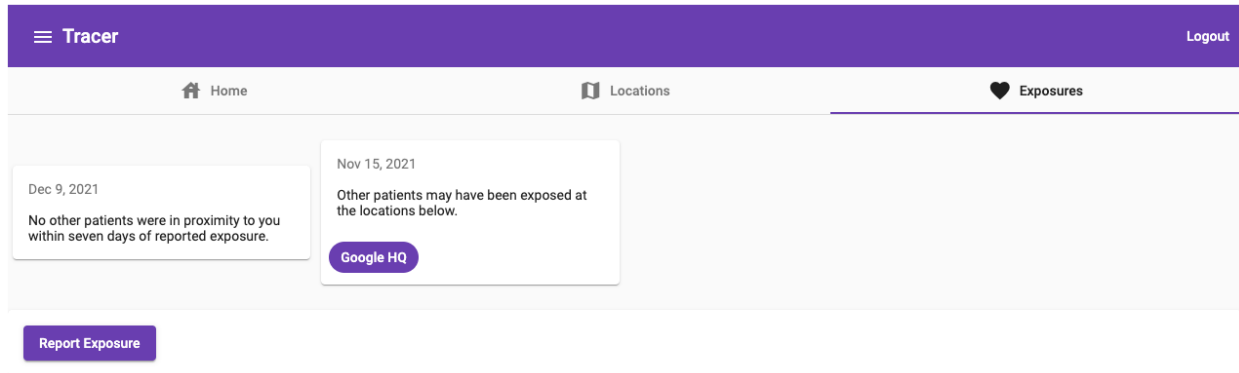
The screenshot shows the Locations Page of the Tracer application. The top navigation bar is purple with a hamburger menu icon, the text "Tracer", and a "Logout" link. Below the navigation bar are three tabs: "Home", "Locations" (selected), and "Exposures". The main content area features a table with the following data:

Name	Latitude	Longitude	Visited
Google HQ	37.422	122.084	Nov 10, 2021
Apple Park	37.335	122.009	Nov 9, 2021

Below the table is a purple button labeled "Add Location".

Exposures Page

If a patient has tested positive for COVID-19, they can report this on the "Exposures" page. By reporting an exposure, Tracer will notify all other patients that were at the same place on the same day within the past week of catching the virus.



Home Page (User 2)

Our other patient, Jane Doe, who was at Google HQ on the same day as John Doe, has been notified that she may have been exposed to COVID-19 after John reported his exposure to COVID-19.

