

For my GUI I used web technologies to build an application that runs in the browser. My application logic can be divided into three parts:

- 1) Client side logic- This is all the stuff that runs in the browser. Everything that the user gets to interact with directly. When you open up the application, see a button, click on it, and watch something happen on, that is all logic that is managed client side. Sometimes our application needs to make calls to the database. People consider making database calls from client side logic a big security issue, because a clever user could gain access to the database, and for this reason some web database technologies won't support database interactions with a web browser. For this reason, I had to also build a server to actually put stuff into and get stuff out of my database.
- 2) Server side logic- You load up the application in the browser and you see a long list of contacts, or you type something into the search bar, press submit, and see some results. The client needs to get all this information from somewhere, but it can't request it directly. It needs to make requests to the server. The server can then query or modify the database, and send information back to the client.
- 3) This is where we store all of our contact information.

Here I will talk about some of the technologies I used in the different application layers:

The client side uses JavaScript and react.js. React is a JavaScript library for building user interfaces. An entire react application is made up of individually designed components. My application is divided into a component for searching contacts, a component for viewing/modifying and deleting a contact, and a component for creating contacts. Each of these components might be made up of further subcomponents. These components all react to the applications "state," which is basically the application's data. As the application data changes, the UI makes appropriate responses.

The server layer uses JavaScript and node.js. JS can usually only run in the browser, to run JS on a server I needed to use the node.js runtime environment. I used the postgres.js library to connect to my database from the server. I used a PostgreSQL database to store my data.