Capstone Project

by Jian Zhou

Weather NZ

weather-nz.vercel.app

Objectives

- Express / Node JS backend to provide data CRUD operations.
- Next.js frontend with ReactJS / typescript to cater a full featured UI.
- Authentication for admin users to manage backend data.

Technologies / Tools

- MongoDB / Cloud
- Next JS / React / Typescript
- Tailwind CSS / Elements
- GitHub
- HTML Canvas
- Express / Node JS

Outline

Building a web app for NZ weather forecast

A backend with DB support / Frontend to present it

Express /NodeJS
MongoDB
NextJS
React / Canvas
Authentication

Measurable
Data presented correctly
Responsive UI
Functional for user interactions

Attainable
MVC model with controllers / models / routes for backend

Frontend uses React components and tailwind elements with html canvas

JWT for authentication

App states for heavy canvas computation:

Fetching/Preprocessing/Done/ Processing/other Busy status

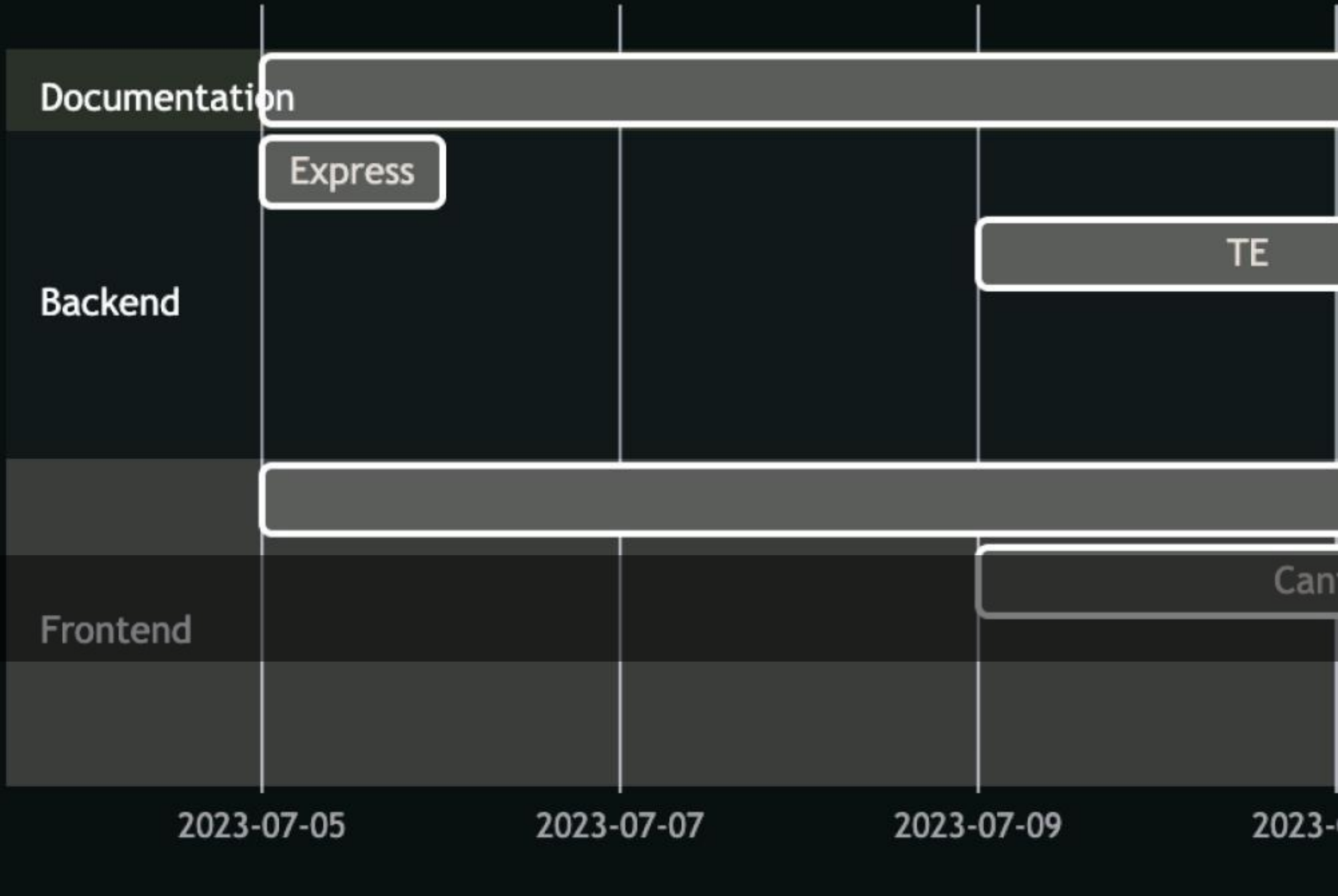
Relevant
The goal's overall alignment with the product

Only have 3 weeks to design and implement f better user experienc

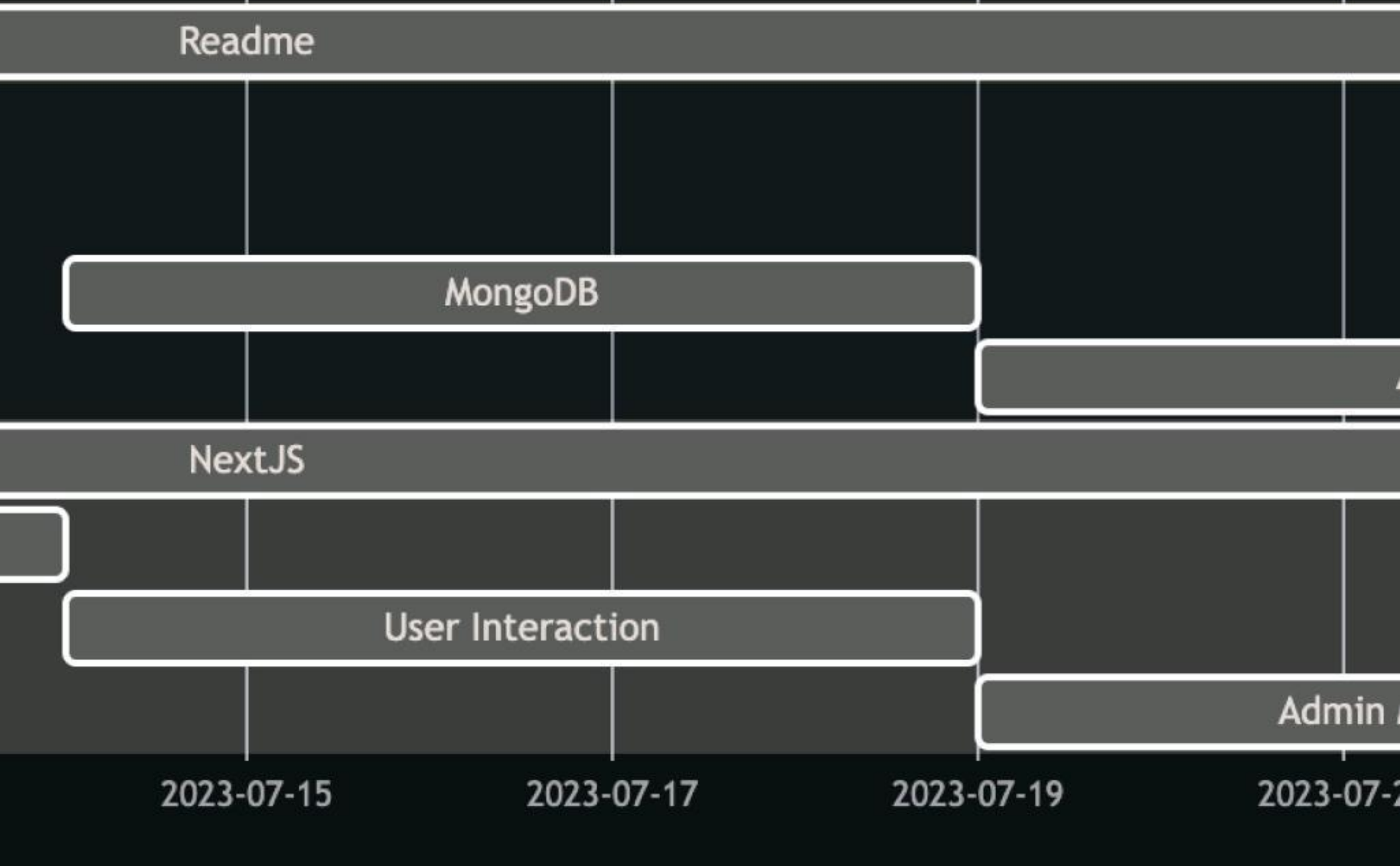
Philosophy and desig patterns:

Minimum network traff and data persistence (expensive and slow)

Maximum data and components sharing (cheap and fast)


Documentation
Express
TE
Backend
Frontend
Can
2023-07-05
2023-07-07
2023-07-09
2023-

nases of The Project



The Backend

- Utilize the weather API and build a backend to cache data for it
- Improve the functionality to facilitate weather checking for New Zealand by incorporating with geographic data.
- Use online data from the United Nations and parse it.
- Adding areas, distance and forced fresh queries for NZ users

Schema

cities

_id	*objectId*	NN	
name	*string*	NN	
area	*string*	NN	
coordinates	*string*	NN	
__v	*double*	NN	

weathers

_id	*objectId*	NN	
city	*string*	NN	
content {}	*object*	NN	
date	*date*	NN	
__v	*double*	NN	

content {} NN

city	*string*	NN	
coordinates	*string*	NN	
latitude	*double*	NN	
longitude	*double*	NN	
generationtime_ms	*double*	NN	
utc_offset_seconds	*double*	NN	
timezone	*string*	NN	
timezone_abbreviation	*string*	NN	
elevation	*double*	NN	
daily_units {}	*object*	NN	
daily {}	*object*	NN	
temperature	*string*	NN	
wind	*string*	NN	
description	*string*	NN	
forecast[{}]	*object*	NN	

daily_units {} NN

time	*stri*
weathercode	*stri*
temperature_2m_max	*stri*
temperature_2m_min	*stri*
uv_index_max	*stri*
showers_sum	*stri*
snowfall_sum	*stri*
windspeed_10m_max	*stri*

daily {} NN

time[ ]	*s*
weathercode[ ]	*do*
temperature_2m_max[ ]	*do*
temperature_2m_min[ ]	*do*
uv_index_max[ ]	*do*
showers_sum[ ]	*do*
snowfall_sum[ ]	*do*
windspeed_10m_max[ ]	*do*

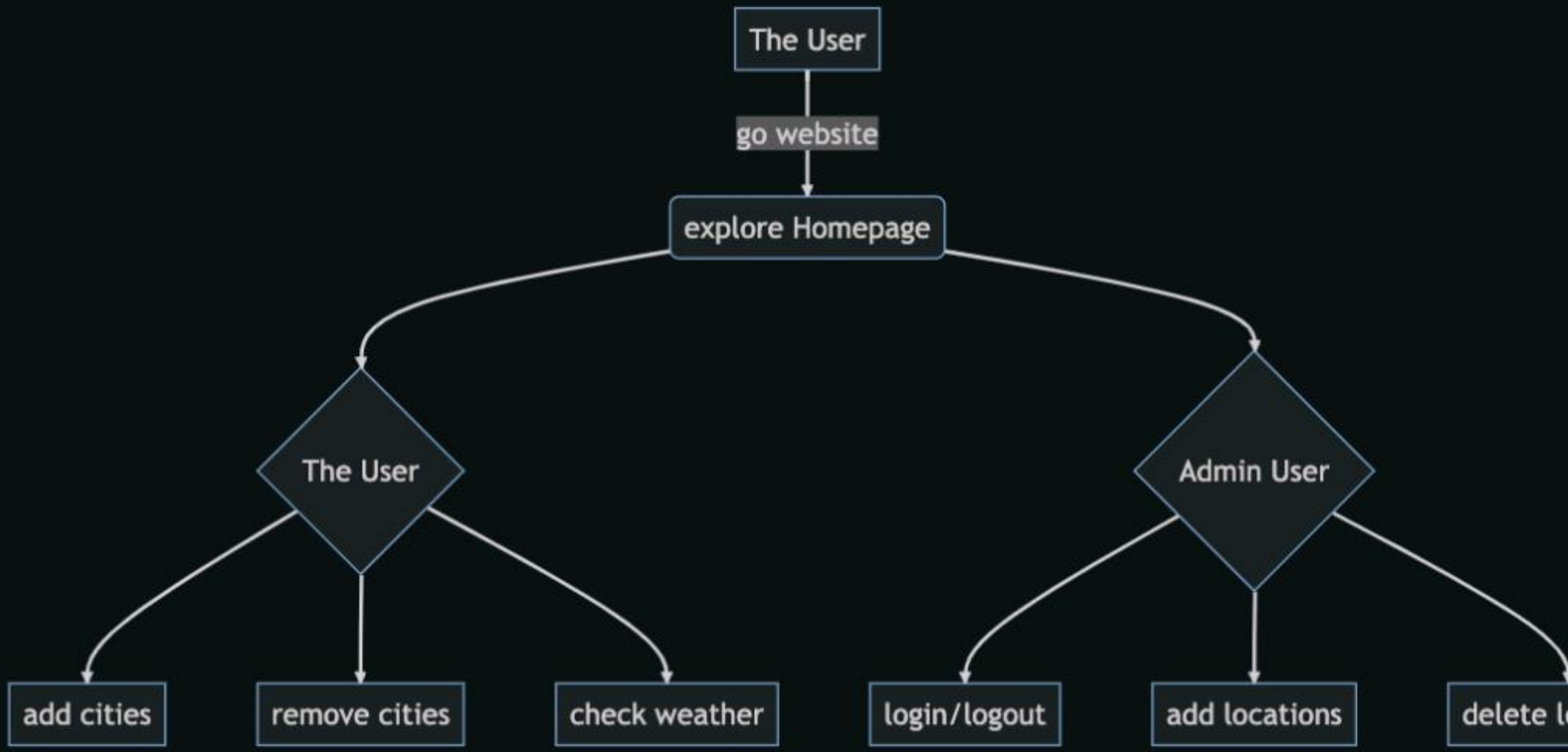
forecast [{}] NN

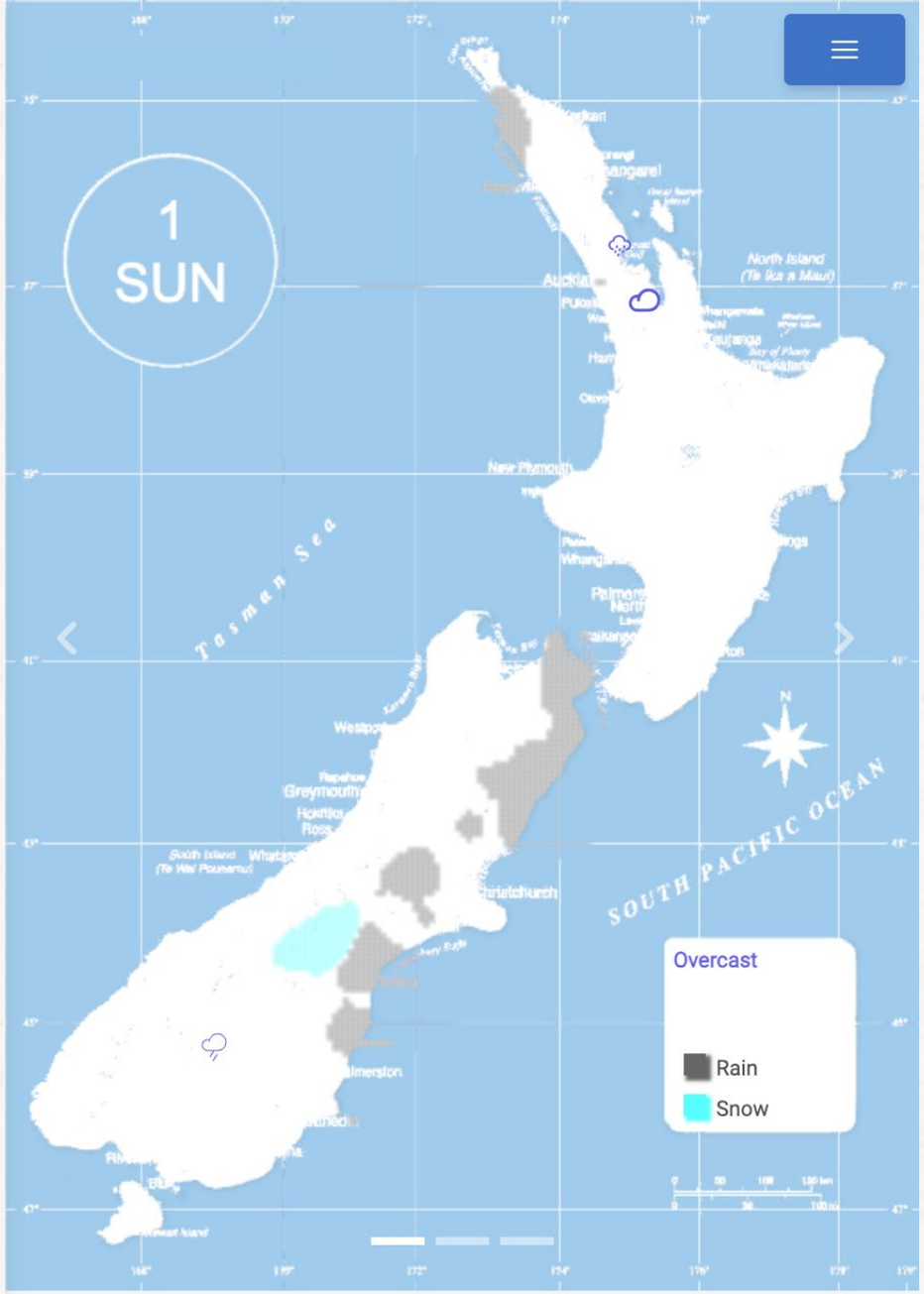
day	*string*	NN
temperature	*string*	NN
wind	*string*	NN

Frontend

onsive design

Workflow


The User
go website
explore Homepage
The User
add cities
remove cities
check weather
Admin User
login/logout
add locations
delete l



OPEN WEATHER API

Free access for non-commercial use.

CONTACT

wood.azure@gmail.com

+ 64 212 355 546

Weather NZ

- Weather 7 Days
- My Cities
- Clear Cache
- Admin
- About

ial use.

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Search
welli

Wellington WGN

Mount Wellington AUK

Wellsford

Mount Wellington

Queenstown

Wellington

WGN

Set Home Remove

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Queenstown OTA

2023-07-22	Mainly clear			SAT
°C	km/h	mm	cm	
4	10	0	0	2.25
2023-07-23	**Overcast**			**SUN**
°C	km/h	mm	cm	
5	6.6	0	0	1.8
2023-07-24	**Overcast**			**MON**
°C	km/h	mm	cm	
8	5.3	0	0	0.9
2023-07-25	**Rain showers: Slight**			**TUE**
°C	km/h	mm	cm	
6	13	0.9	0	1.75
2023-07-26	**Snow showers slight**			**WED**
°C	km/h	mm	cm	
5	13.6	0.3	0.21	1.95
2023-07-27	**Rain: Slight**			**THU**
°C	km/h	mm	cm	
5	7.1	0	0	0.45
2023-07-28	**Fog**			**FRI**
°C	km/h	mm	cm	
3	4.1	0	0	2.5

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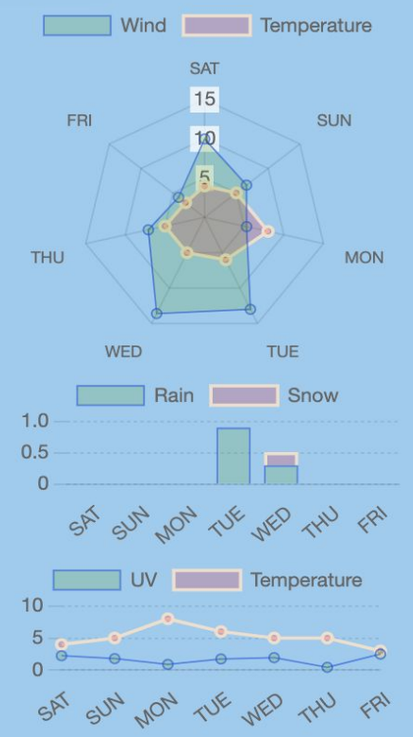
Queenstown OTA



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Please login to your account

Username
zhouj

Password
••••••••••••

LOG IN

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Home > Locations

Select Region
AUK

Add a new location

Name

Area
AUK

Coordinates

SUBMIT

Mangere Mansion House Manukau City
Matakana Matiatia Bay Metroport/Auckland
Moerewa Mount Wellington New Lyn
Newton North Shore City Northcote
Onehunga (Manukau Harbour) Orakei Oratia
Orewa Otahuhu Pakatoa Island
Pakuranga Panmure Papakura
Parnell Penrose Point Chevalier
Pokeno Ponsonby Port Fitzroy
Pukekohe Saint Heliers Silverdale
Surfdale Takanini Takapuna
Tamaki Titirangi Torbay Tryphena
Waiheke Island Waitakere Waiuku
Warkworth Western Springs Weymouth
Whangaparaoa Whangaparapara Whenuapai

Home > Locations

Select Region
GIS

Add Gisborne GIS 01 GIS 02

Edit a location

{"result":200,"data":{"_id":"64b7dc32c05f7fc3dc40eaa5","name":"test","area":"GIS","coordinates":"nonesense","__v":0}}

Name
test

Area
GIS

Coordinates
nonesense

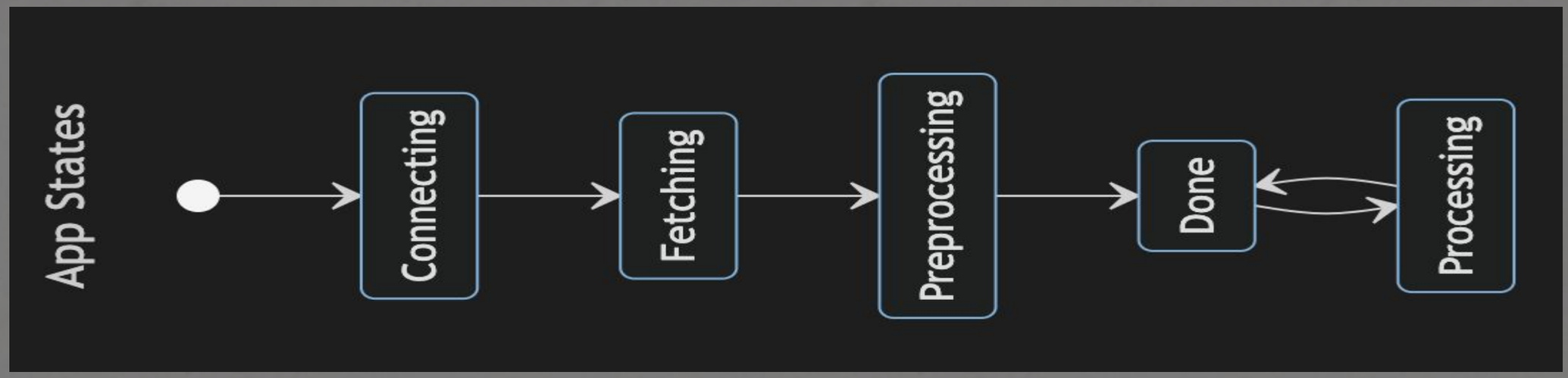
SUBMIT

CONTACT

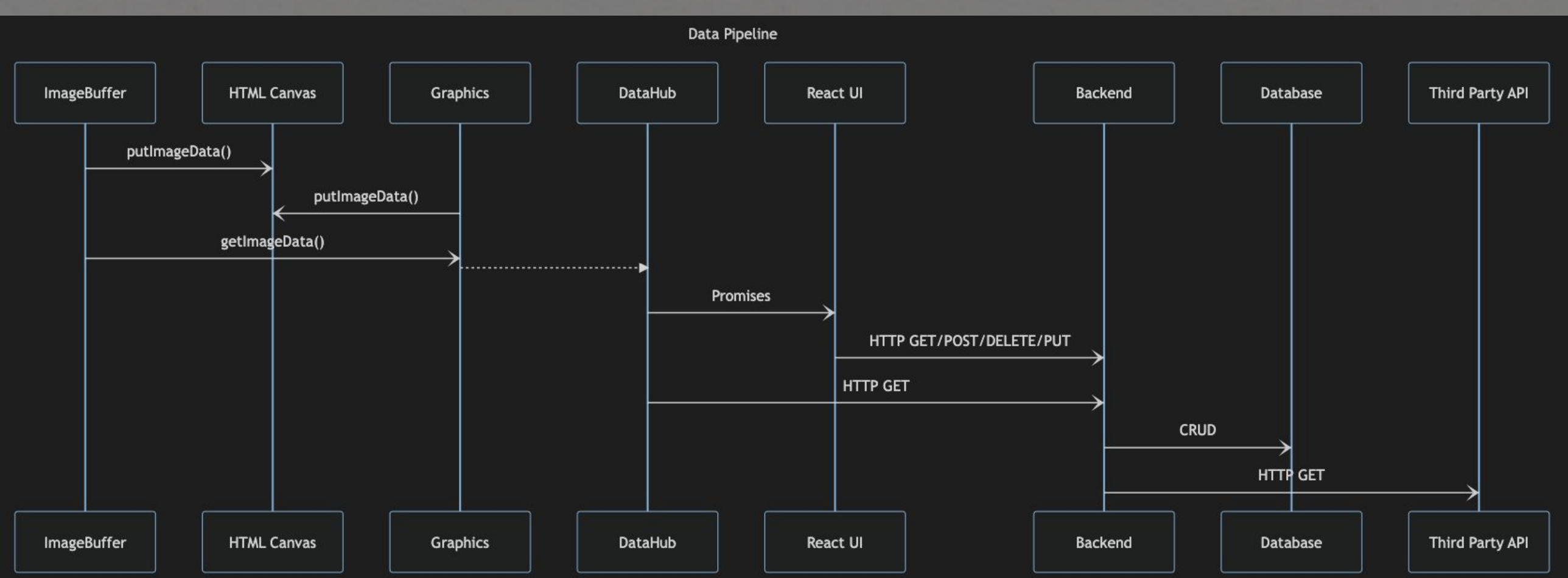
ail.com

355 546

- Frontend State Management



- Backend/Frontend Data Pipeline



Summary

- Stakeholders
- Frontend State Management
- Conceptual Ideas
- Design Patterns
- DevOps Strategic Alignment

Thank you!

Please visit https://weather-nz.vercel.app/