Android App for Generating Station

Working of the Present Powerplant App

The installed smart meters read the relevant data and uploads or stores it on a central server in the powerplant. This server and the smart meters are connected on a common network. The meters uploads the data and the server stores it in the form of a JSON file which can be visualised as a simple file containing variables and their values.

The app, presently running on the server then displays the required data. Any calculations that are required (to find out the value of a variable) are performed on the server itself.

The Android app fetches the data through an API hosted on the AWS server. The data is being manipulated in a see-saw manner, i.e, every second the data is being pushed on the AWS server, and at the same moment, it is being pulled by the Retrofit API. Retrofit API helps in fetching the data through the “GET” request.

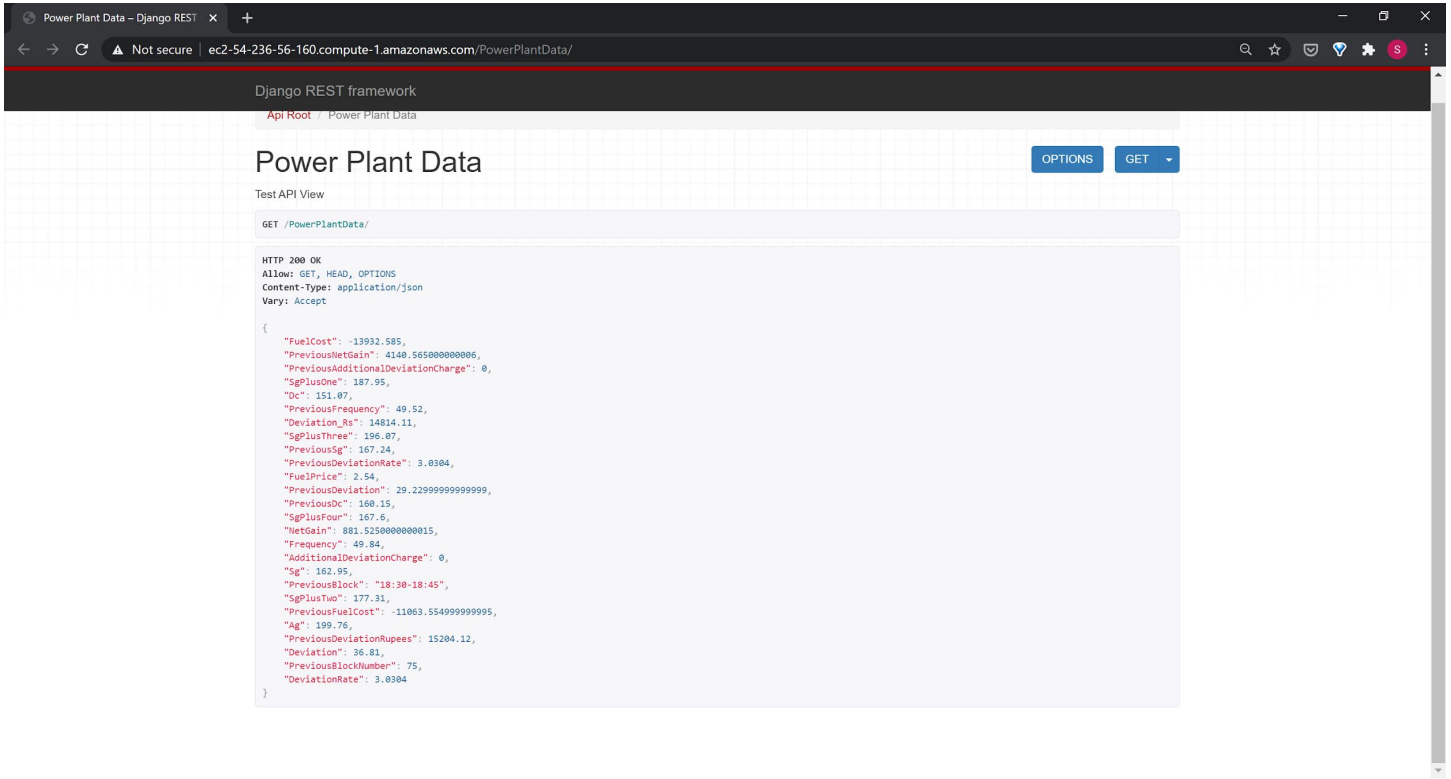
Working of our application

We have managed to replicate the present powerplant system. We've hosted the data on an AWS (Amazon Web Services) server. This data is randomized within the respective ranges and dynamically updated for every time block (15-minute interval) and any required calculations are performed on the server itself. This frees up the resources on the user's device and makes the app faster.

The server is accessed through the app by providing a link. While running the app on the powerplant, this link can be modified to access data from the powerplant's server and the app would function in the same way.

The hosted data is shown in the next slide.

Hosted Data on the Server



Links to access the data

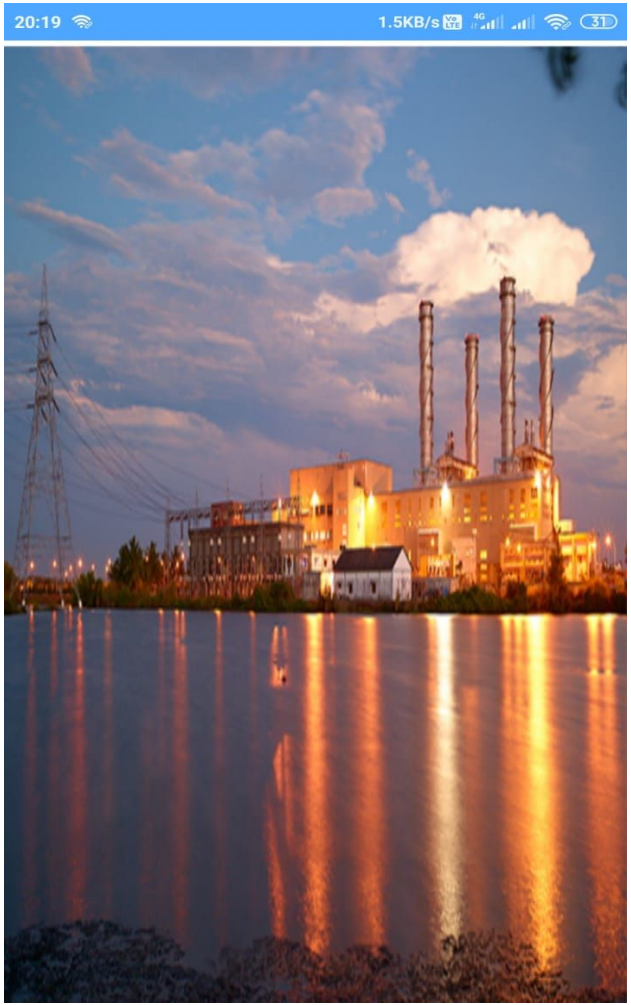
- http://ec2-54-236-56-160.compute-1.amazonaws.com/PowerPlantData/
- http://ec2-54-236-56-160.compute-1.amazonaws.com/TimeData/

Working of the app

The following slides present the working of the app

Loading Screen

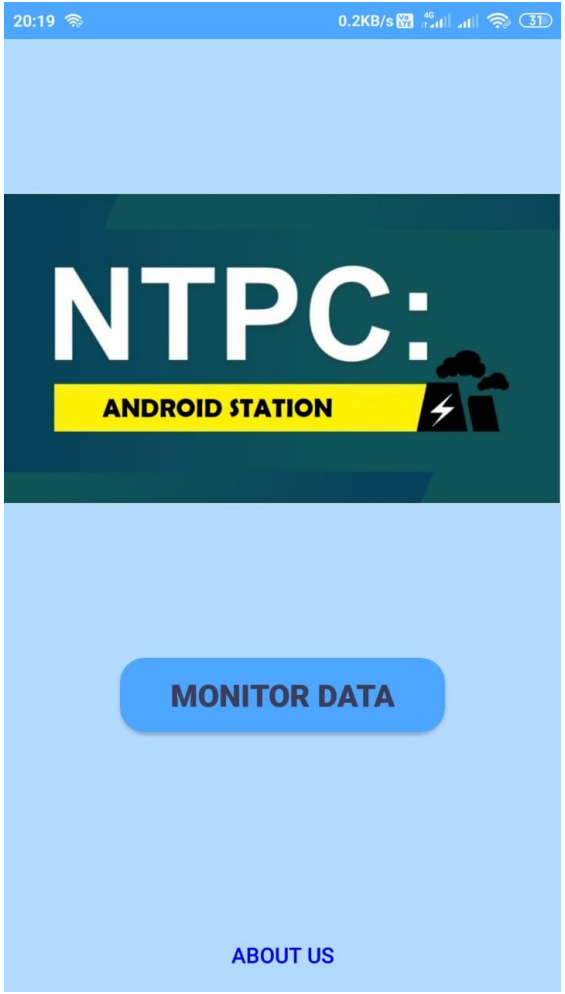
On launching the app, the following loading screen appears. The required data in the app is loaded in the background and the user is then redirected to the menu activity (in the next slide).



Main Menu

This is the main menu layout of the app which gives the user the option to enter the address of the server (where the data is stored).

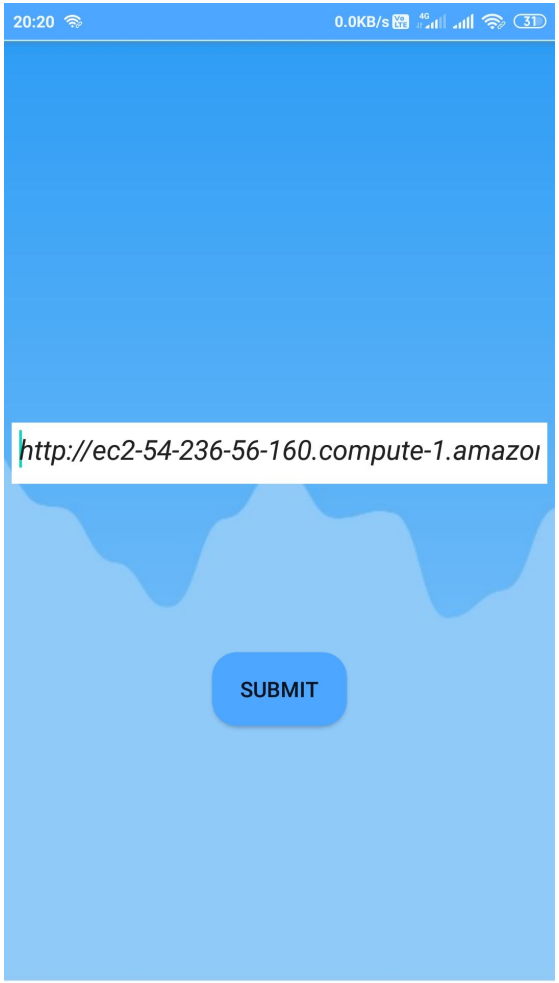
The About Us button shows a brief description of the powerplant.



Monitor Data

This allows the user to enter the address of the server where the data is stored. By default, it uses the address of the mock server where we've stored the data.

Upon clicking submit, we're taken to the following screen (next slide).



Data

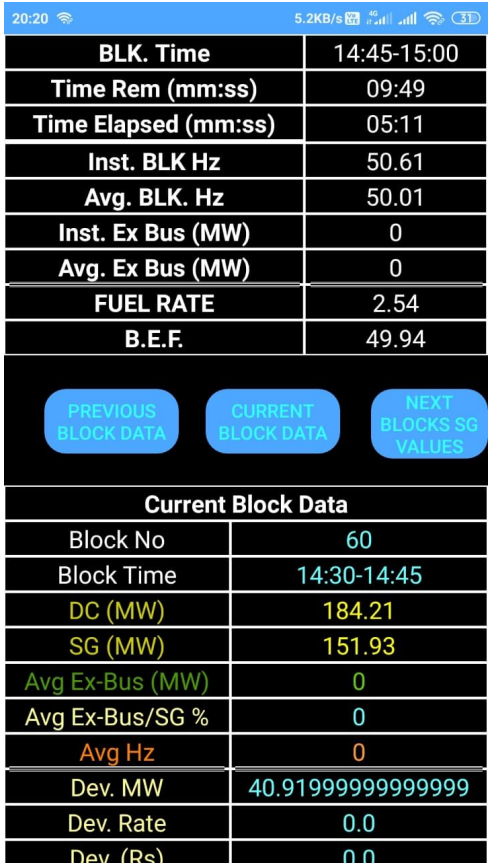
This screen shows the data for the current time block. There are also three tabs below which, upon clicking, show the data for the previous, (additional data) for the current and SG values for the next four blocks.

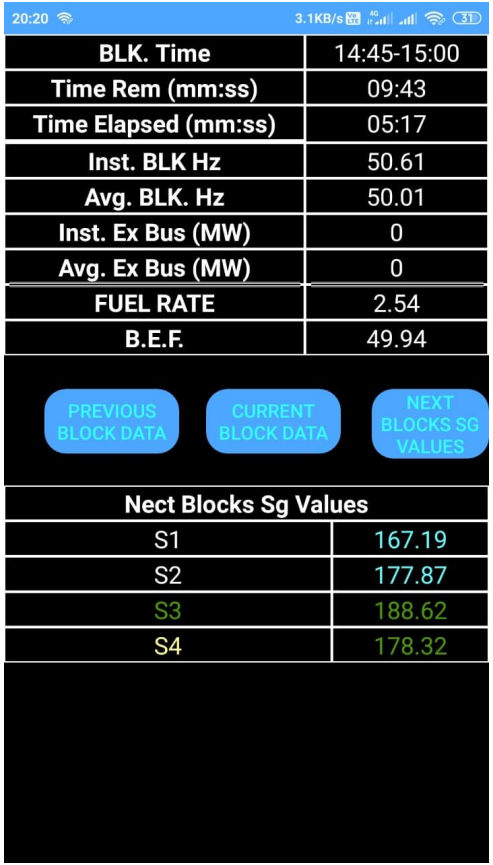
We've used mock data, i.e. we've used randomized values based on appropriate ranges for each data.

The following slide shows the screen on clicking the three tabs:

Note: The discrepancy between the device time and the block time shown on the app is because the server's (which is based in the US) time is used. We've tested the app and it doesn't affect the working of the app.


20:20
1.7KB/s
BLK. Time 14:45-15:00
Time Rem (mm:ss) 09:52
Time Elapsed (mm:ss) 05:08
Inst. BLK Hz 50.61
Avg. BLK. Hz 50.01
Inst. Ex Bus (MW) 0
Avg. Ex Bus (MW) 0
FUEL RATE 2.54
B.E.F. 49.94
PREVIOUS BLOCK DATA
CURRENT BLOCK DATA
NEXT BLOCKS SG VALUES
Previous Block Data
Block No 59.0
Block Time 00:00
DC (MW) 167.86
SG (MW) 188.91
Avg Ex-Bus (MW) 0
Avg Ex-Bus/SG % 0
Avg Hz 50.77
Dev. MW 1.5999999999999943
Dev. Rate 0.0


20:20
5.2KB/s
BLK. Time 14:45-15:00
Time Rem (mm:ss) 09:49
Time Elapsed (mm:ss) 05:11
Inst. BLK Hz 50.61
Avg. BLK. Hz 50.01
Inst. Ex Bus (MW) 0
Avg. Ex Bus (MW) 0
FUEL RATE 2.54
B.E.F. 49.94
PREVIOUS BLOCK DATA
CURRENT BLOCK DATA
NEXT BLOCKS SG VALUES
Current Block Data
Block No 60
Block Time 14:30-14:45
DC (MW) 184.21
SG (MW) 151.93
Avg Ex-Bus (MW) 0
Avg Ex-Bus/SG % 0
Avg Hz 0
Dev. MW 40.91999999999999
Dev. Rate 0.0


20:20
3.1KB/s
BLK. Time 14:45-15:00
Time Rem (mm:ss) 09:43
Time Elapsed (mm:ss) 05:17
Inst. BLK Hz 50.61
Avg. BLK. Hz 50.01
Inst. Ex Bus (MW) 0
Avg. Ex Bus (MW) 0
FUEL RATE 2.54
B.E.F. 49.94
PREVIOUS BLOCK DATA
CURRENT BLOCK DATA
NEXT BLOCKS SG VALUES
Nect Blocks Sg Values
S1 167.19
S2 177.87
S3 188.62
S4 178.32

Future Work

We'll work on optimizing the UI of the app and fixing bugs, if any.

As part of our coursework this semester, we will be developing a machine learning model to predict the scheduled generation values. We will try to implement it in the android application as well. Again, the server will perform the necessary calculations in order to take the load off the user's device (phone).