



HACKEREARTH TEAM NAME - VYSTER\_IIT\_BHU  
HOMEFIRST IDEA SUBMISSION

**Web App for density plots on Point of interests**

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<https://github.com/vyster/Homefirst> Hackathon

# Homefirst Hackathon

## PROBLEM STATEMENT

### **Point of interest (Web App):**

Identify selected set of point of interest and calculate density plots over the map (ATMs, Hospitals, Banks, Hardware Shops, Supermarkets, Schools, Colleges, Two Wheelers Density, 4 Wheeler Density, Gas Connection Providers/ Depots, Grocery Shops, Business Centers, Petrol Pumps, Parking Spaces, Service Centers (Vehicle, Electronics), Stationary Shop, Laundry, Public Transport (Bus, Metro, Train), Airports)

## SOLUTION

After noting points mentioned in the PS :-

For creating a solution we can start by an ideation of making Knowledge Graphs and Taxonomies between entities (point of interests). Heat Maps and Density Visualisations in accordance to Point of Interests

Knowledge graphs can be made by using XLSX/JSON for better SEO to leveraging taxonomy ie. Combining knowledge graphs and machine learning technologies.

We need to explore the naturally occurring structure of **Homefirst's** metadata to come up with an appropriate ontological structure (e.g. creating communities). Using this structure, we should be able to identify patterns in the data that can help us solve use-cases like :-

### **Used cases [Homefirst's PS specific]**

- Develop a new Legacy system to store taxonomies of Customer Behaviour and preferences and give suggestions of a product to customers.
- Recommend Heat maps and plots visualisations.

Graph databases understand the connections in large and varied data sets Ease Visualisation and even help Finding Trilogies Analysis of graph structured data help us to provide invaluable insights about the relationships between entities, as well as enable optimisations over a network of interconnected objects [w.r.t. Conventional Methods] , Much closer to our whiteboard model Calculate best route by certain algorithms [DIJKSHTRA's and other graph Algo] of connected semi structured data.

# HIGH LEVEL SOLUTION ARCHITECTURE

## **Data Transformation**

Here we need to build a process that consumes several jsons and creates a collated json or csv with the relevant features

## **Data Modelling**

We need to build a weighted undirected graph. We should explore the different pros and cons of a sparse or dense graph . Labelled entities in the nodes. The structure should be built in such a way it can help in addressing the set of identified use-cases Other ways to build the ontology other than using just occurrences.

## **Data Operations**

Be able to save the data to a database or in an appropriate file-format, add and delete data from it

Finally we should be able to use it for our use-case by extracting information from it.

# TECHNOLOGY STACK

HOMEFIRST HACKATHON IDEA SUBMISSION

For Development, **JavaScript and Flask** will be used for building the UI and Solution will be built using Python.

**Github** will offer a platform to open source and host the code for reusability and displaying to the Tech team.

✦ **PROGRAMMING LANGUAGES** - PYTHON, C++ AND JS.

✦ **FRAMEWORKS & LIBRARIES** - KERAS, TF AND NODEJS

✦ **SERVERS** - LOCAL AND GCP.

✦ **UI/UX SOLUTIONS** - ADOBE, BOOTSTRAP AND FLASK.

✦ **OTHER TOOLS TO BE USED** - GITHUB, STACK-OVERFLOW AND JUPYTER NOTEBOOK