



Infrastructure Mapper - Culinary Facilities

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About Me

- Intern at **Kartoza**
- Bachelor of Engineering, majored in Geodetic Engineering
- Currently exploring GIS with a growing interest in open-source GIS. Passionate about GIS and map styling.

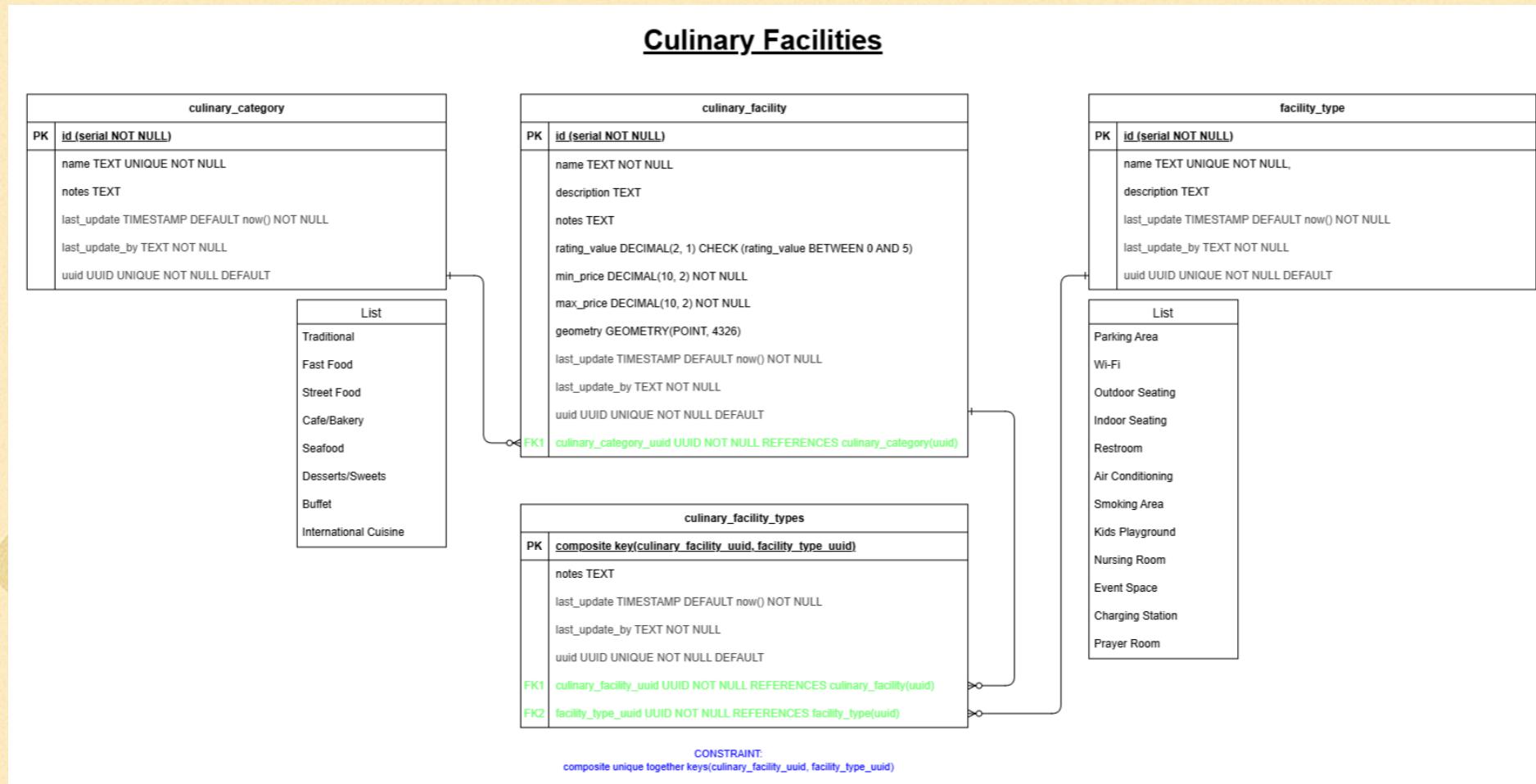


Tools Used

- QGIS
- QFieldCloud
- PostgreSQL
- PostGIS
- pgAdmin
- VS Code
- Marp
- Git
- GitHub



The Model





The Forms

The screenshot displays the Infrastructure Mapper application interface, specifically the 'Form Layout' and 'Relation' configuration panels.

Form Layout: This panel lists the fields for a form. The fields listed are: id, name, description, notes, culinary_category_uuid, rating_value, min_price, max_price, and Culinary_Facility_Types. The 'Culinary_Facility_Types' field is currently selected.

General: This panel contains settings for the selected field. It includes an Alias (Culinary Category), a Comment (The UUID of the culinary category, referencing the culinary_category table.), and checkboxes for Editable (checked) and Reuse last entered value. There is also a Label on top checkbox.

Widget Type: This panel specifies the type of widget for the selected field. It is set to 'Value Relation'. Under this setting, it requires selecting a layer, key column, and value column. The Layer is set to 'Culinary Category', Key column is 'abc uuid', and Value column is 'abc name'.

Relation: This panel shows the relationship configuration for the selected field. The Cardinality is set to 'Many to one relation'. There is a checkbox for Force hide form on add feature, which is unchecked. The Widget Type is set to 'Relation Editor'. Below this, the 'Project Properties — Relations' table shows a single entry:

Name	Referenced Layer	Referenced Field(s)	Referencing Layer	Referencing Field(s)	Strength
Culinary_Faci...	culinary_facility	uuid	culinary_facility_t...	culinary_facility_...	culinary_f_culina...

An 'Add Relation' dialog box is open, showing the configuration for a new relation:

Referenced (parent)	Referencing (child)
Layer: * culinary_facility	culinary_facility_types
Field 1: 123 ID	123 fid

At the bottom right of the interface, there are buttons for OK, Cancel, and Help.

✓ Add feature on culinary_facility

81

Name

Description

Notes

Culinary Category

Rating Value

Minimum Price

Maximum Price

Culinary_Facility_Types

Description

Notes

Culinary Category

Not NULL

Traditional

Fast Food

✓ Add feature on culinary_facility_types

culinary_facility.uid
12c325e0-0704-4a98-a8de-b5c2de2e785e

facility_type.uid

Parking Area

Wi-Fi

Outdoor Seating

Indoor Seating

Restroom

Air Conditioning

Smoking Area

Kids Playground

Nursing Room

Event Space

Charging Station

Prayer Room

The screenshot displays a user interface for managing culinary facilities. On the left, there's a form with fields for Name, Description, Notes, Culinary Category, Rating Value, Minimum Price, Maximum Price, and Culinary_Facility_Types. On the right, there are two expanded dropdown menus. The top menu, under 'Culinary Category', shows 'Traditional' and 'Fast Food'. The bottom menu, under 'Culinary_Facility_Types', shows various amenities like 'Parking Area', 'Wi-Fi', 'Outdoor Seating', etc. Two red arrows point from the 'Culinary Category' and 'Culinary_Facility_Types' sections in the left panel to their respective dropdown menus in the right panel.



Field Collection

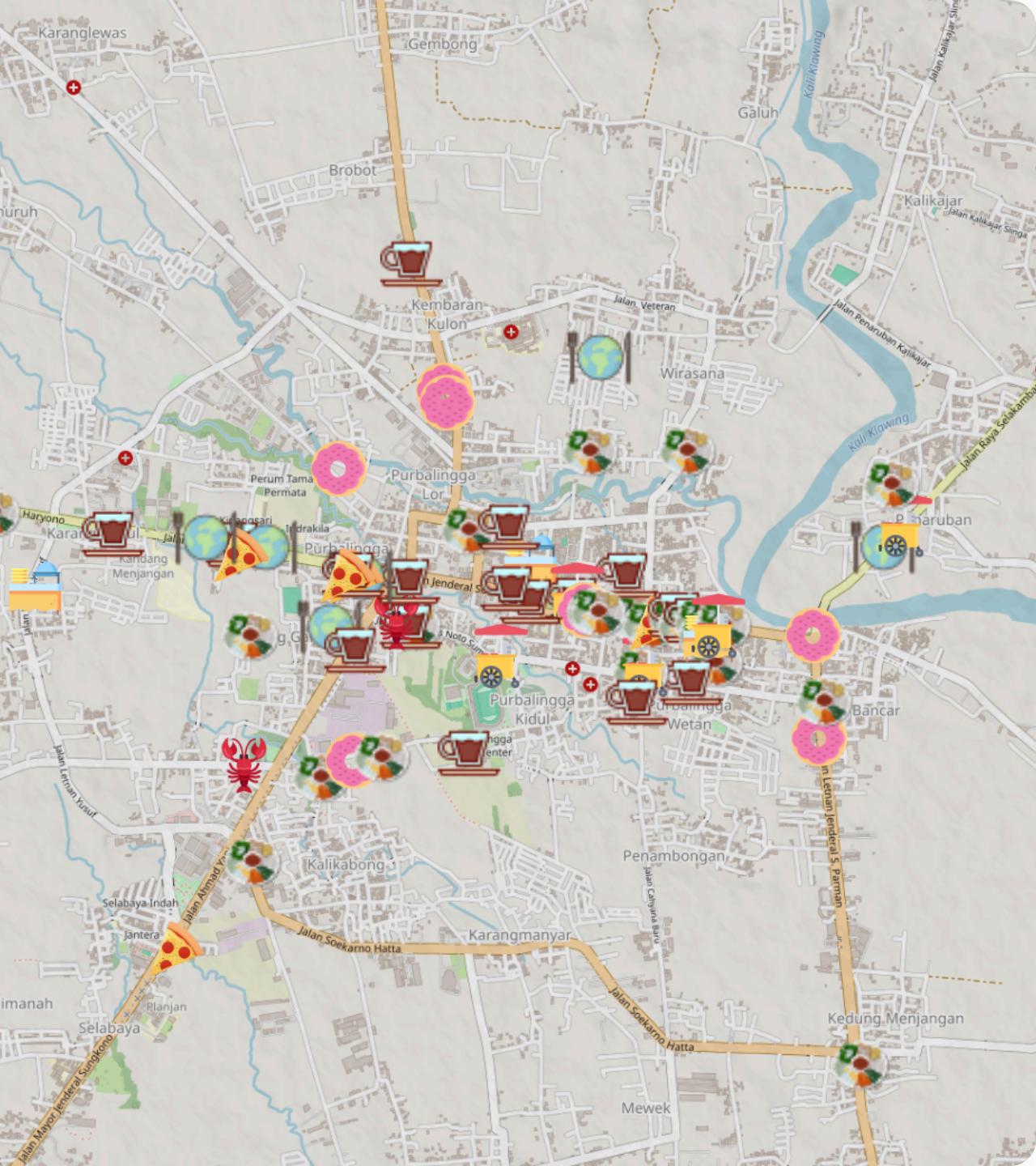
Data collected in the field
using mobile GIS apps and
GPS-enabled devices.





Collection Results

- **Total features collected:**
 - Points: 80
- **Area covered:** 15 km²



? Analysis Problem

- How can we determine culinary facilities that are reachable within a specific travel time from a central point?
- Which culinary facilities that can be reached within 8 minutes and offer the best combination of **low price, high ratings**, specific **facilities** like Wi-Fi and indoor seating, and specific **category** like Cafe/Bakery?



Methodology

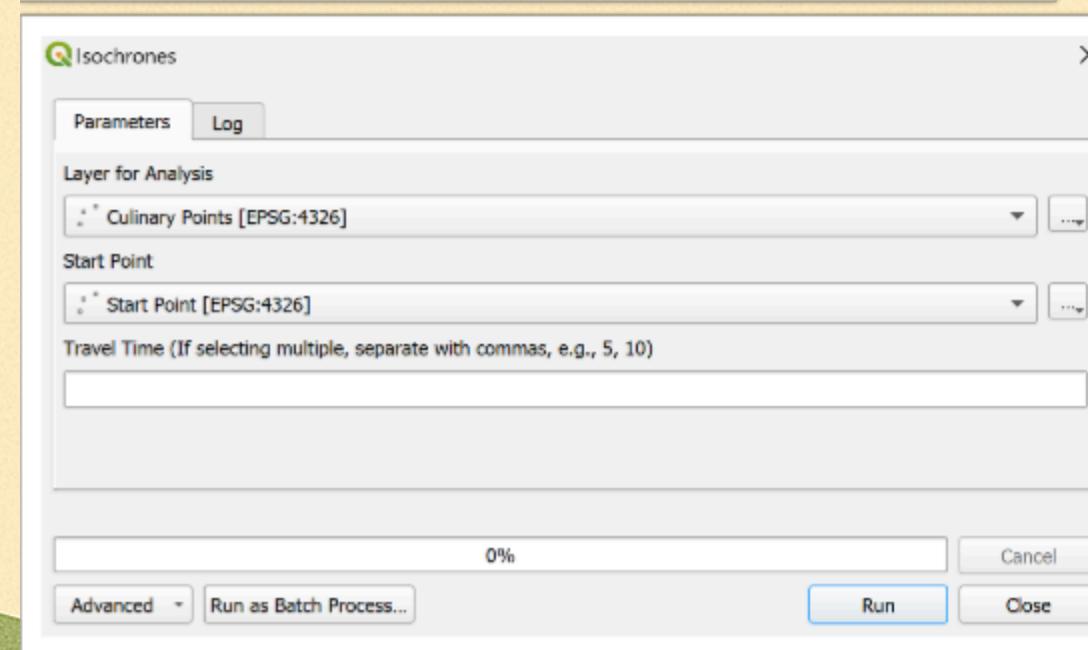
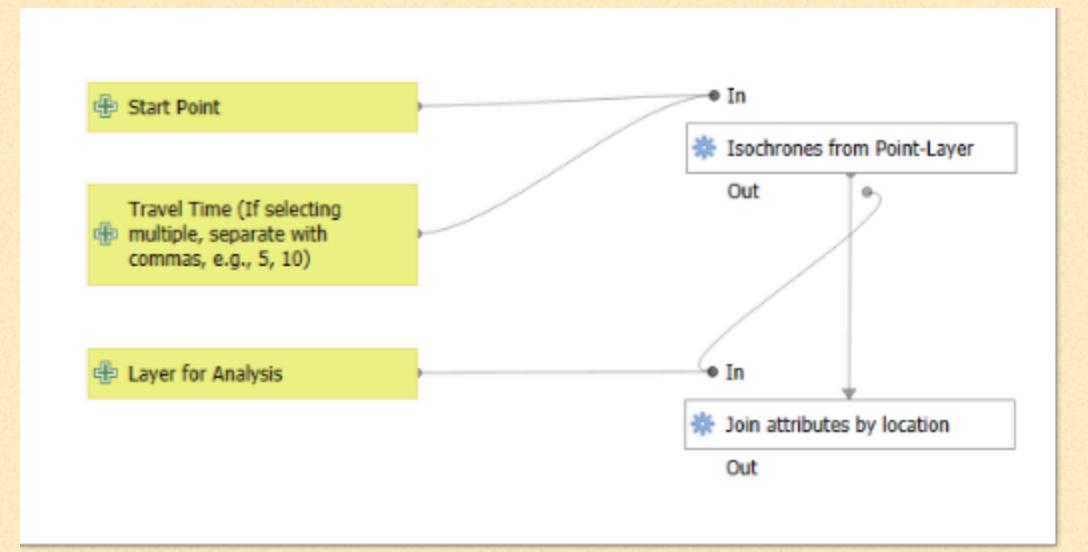
The image shows two QGIS dialog boxes side-by-side:

Isochrones - Isochrones from Point-Layer

- Description: Isochrones from Point-Layer
- Show advanced parameters
- Provider: openrouteservice
- Travel mode: cycling-regular
- Input Point layer: Using model input Start Point
- Input layer ID Field (mutually exclusive with Point option) [optional]: 123
- Dimension: 123 time
- Comma-separated ranges [min or m]: Using model input Travel Time (If selecting multiple, separate with commas, e.g., 5, 10)
- Location Type: start
- Isochrones_Layer_2025-06-27_12:12:50
- ogr:dbname='C:/Users/ACER/QField/cloud/KartozaInterns_KartozaInterns2025/InfrastructureMapper.gpkg' table="Isochrones" (geom)
- Dependencies: 0 dependencies selected

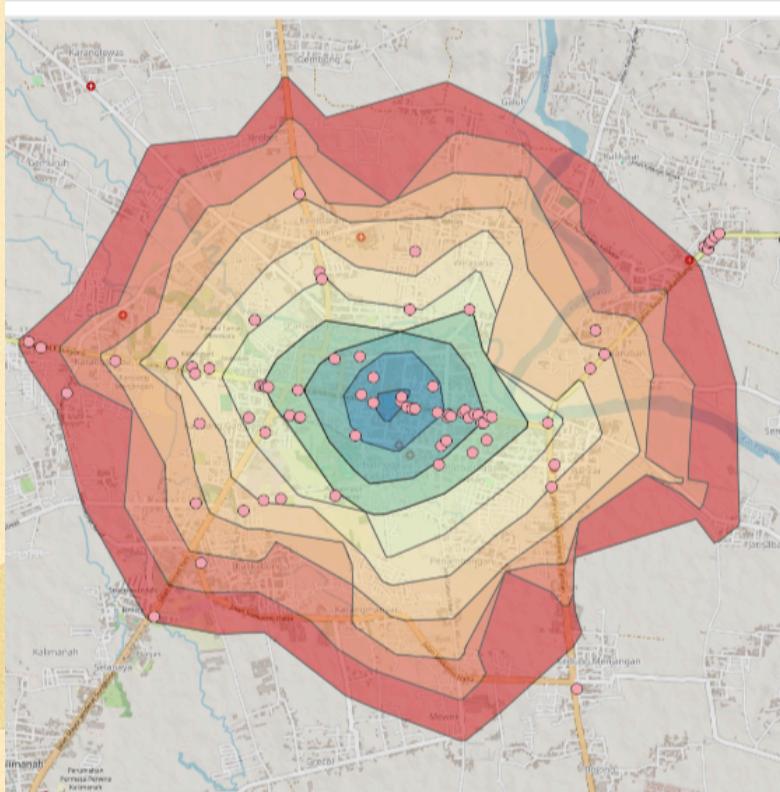
Vector general - Join attributes by location

- Description: Join attributes by location
- Join to features in: Using model input Layer for Analysis
- Features they (geometric predicate): 123 intersect
- By comparing to: Using algorithm output "Isochrones_Layer_2025-06-27_12:12:50" from algorithm "Isochrones from Point-Layer"
- Fields to add (leave empty to use all fields) [optional]: 123 AA MINS
- Join type: 123 Create separate feature for each matching feature (one-to-many)
- Discard records which could not be joined: 123 Yes
- Joined field prefix [optional]: 123
- Joined layer [optional]: 123 ogr:dbname='C:/Users/ACER/QField/cloud/KartozaInterns_KartozaInterns2025/InfrastructureMapper.gpkg' table="Selected Features by Travel Time" (geom)
- Unjoinable features from first layer [optional]: 123 [Enter name if this is a final result]
- Dependencies: 1 dependency selected

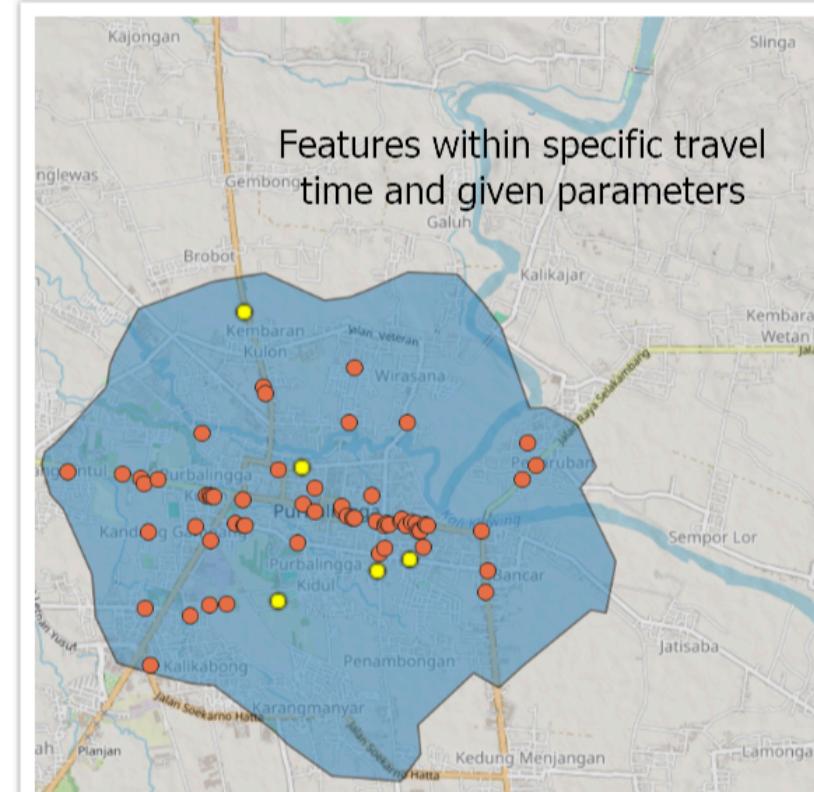




Results



Isochrones Result



Features within specific travel time and given parameters

Price Range: 1.000-50.000
Rating: above 4.5
Facilities: Indoor Seating, Wi-Fi
Category: Cafe/Bakery
Travel Time: 8 minutes



Insights

- Top Categories with High Ratings

fid	category_name	avg_rating
1	Desserts/Sweets	4.6125
2	International Cuisine	4.583333333333333
3	Buffet	4.55

- Most common facility: Parking Area (70)
- Most common category: Traditional (28)



Further Research

If I had more time, I would:

- Develop a specific travel mode for motorcycles to better represent real conditions, possibly using custom routing technology.
- Improve the model so users can select facilities and categories using dropdowns connected to the lookup table, ensuring updates are reflected automatically.
- Increase the study area and collect more data to improve the analysis



My Internship Experience

Highlights

- Mastered QGIS and explored various GIS tools and workflows
- Contributed to impactful projects
- Improved problem-solving, adaptability, and critical thinking
- Enhanced time management while balancing multiple tasks and responsibilities
- Improved English communication skills through professional and collaborative engagements



Contact Me

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Prompt: Create a GIS related image for the Analysis Problem slide

