User Guide

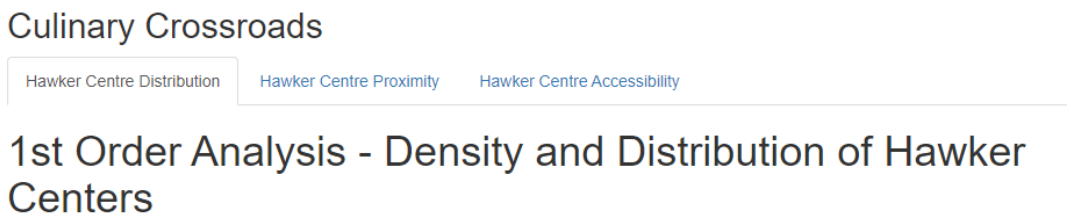
Prepared by Team 5: Culinary Crossroads

Link to our Shinyapp: https://geraldlimjw.shinyapps.io/CulinaryCrossroads/

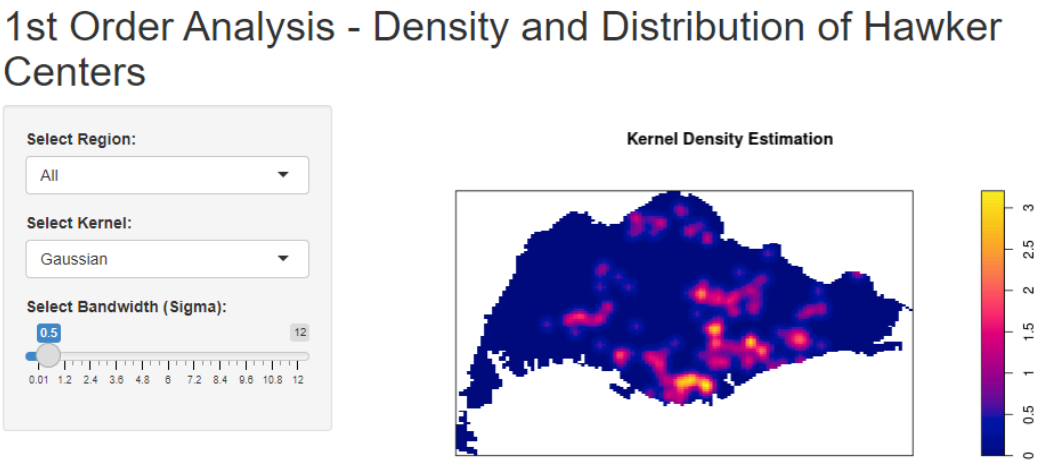
Modules
Module 1: 1st Order Analysis - Density and Distribution of Hawker Centres
Module 2: 2nd Order Analysis - Hawker Centre Proximity
Module 3: Geographic Accessibility Modelling of Hawker Centres

Module 1: 1st Order Analysis - Density and Distribution of Hawker Centres

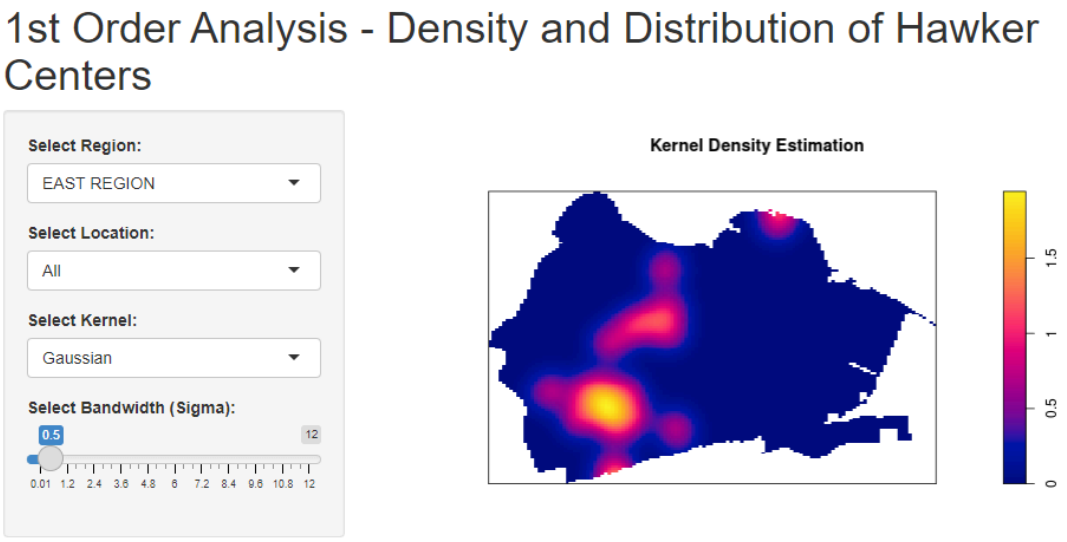
1. Once you have accessed the shinyapp website, you will be able to see the navigation bar at the top of the site.
    a. Select “Hawker Centre Distribution”



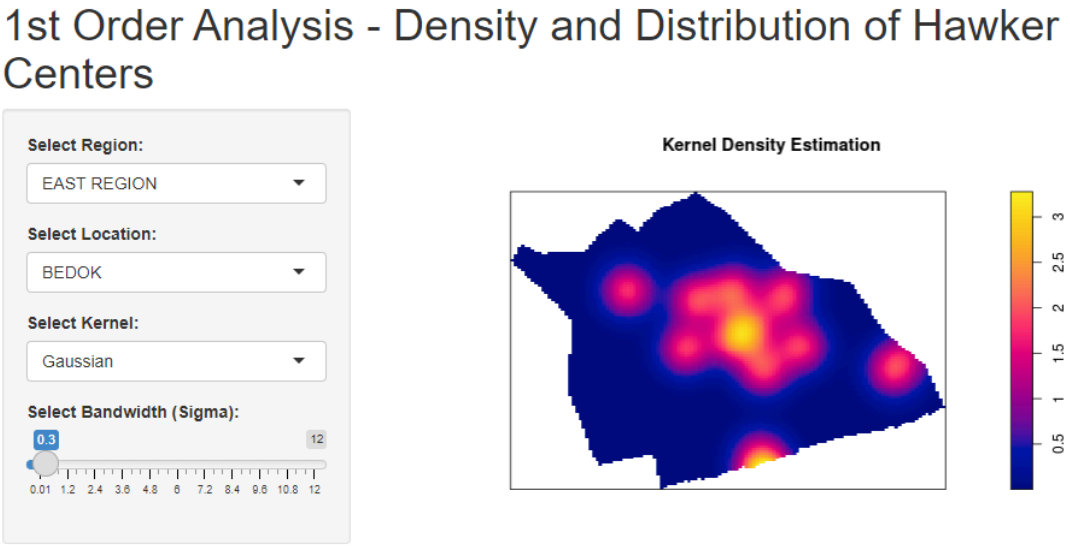
2. Within the “1st Order Analysis - Density and Distribution of Hawker Centers” tab, you would see the Kernel Density Estimation (KDE) of the whole Singapore.
    a. By default, the settings for the 1st Order Analysis will be set to:
        i. “All” for Region
        ii. “Gaussian” for Kernel
        iii. “0.5” for Bandwidth.
    b. The map will be shown on the right side of the site
    c. You may choose to change the Kernel type or the Bandwidth



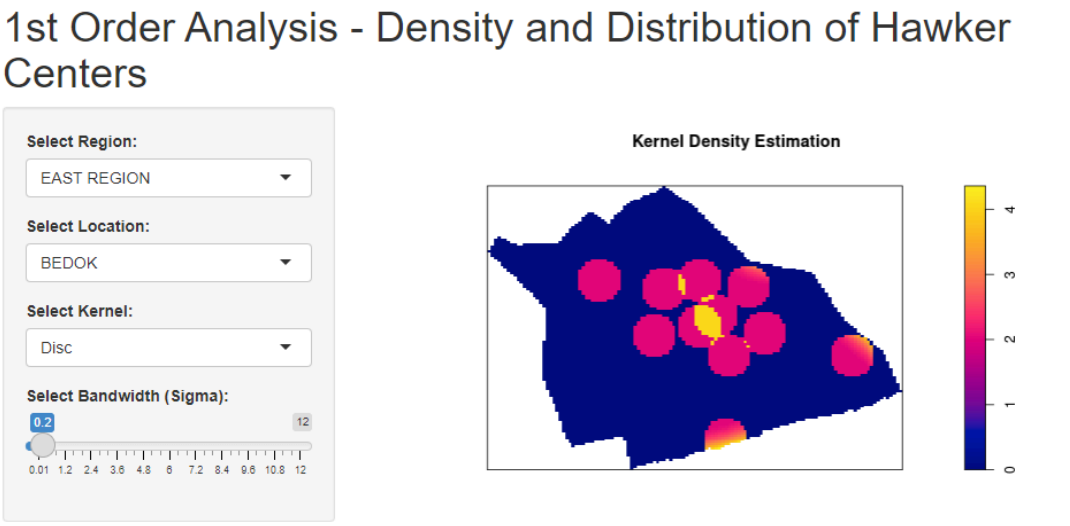
3. To look into the distribution of the hawker centres in a specific region
    a. Choose a region (e.g. CENTRAL REGION / EAST REGION)
    b. In the example below, we set the Region to “EAST REGION”, while keeping the Kernel and Bandwidth to the default value



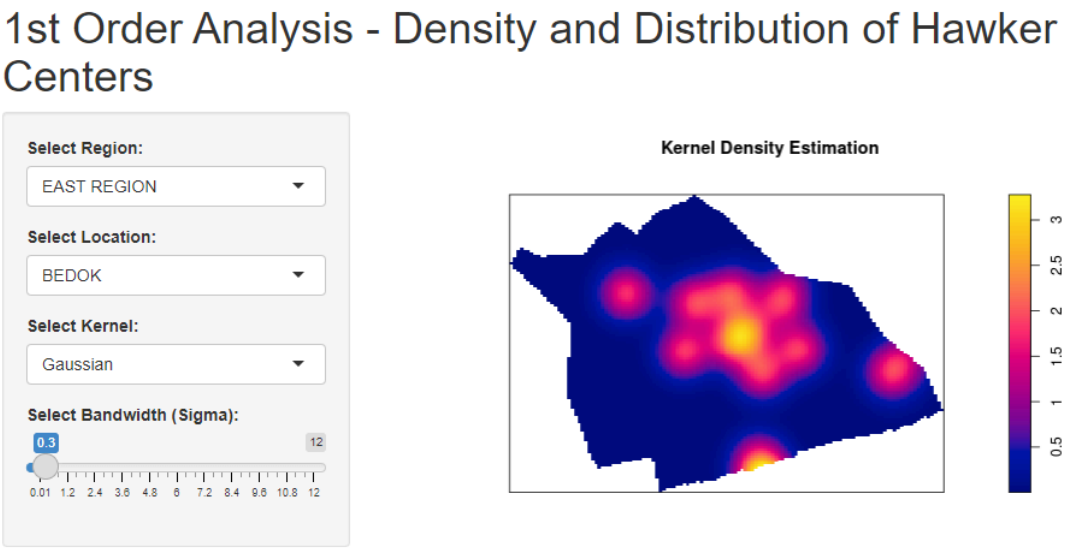
4. To look even deeper into the distribution of the hawker centres in a specific location within a region
    a. Choose a region (e.g. CENTRAL REGION / EAST REGION / NORTH REGION / NORTH-EAST REGION / WEST REGION)
    b. Choose a location (e.g. BEDOK, PASIR RIS, TAMPINES)
    c. In the example below, we set the Region to “EAST REGION” and the Location to “BEDOK”. We will also change and Bandwidth default value of 0.5 to 0.3



5. If we were to change the Kernel type and Bandwidth, it will provide a different view as per the changes.
    a. For the example below, if we set the Kernel type to “Disc” and Bandwidth to “0.2”



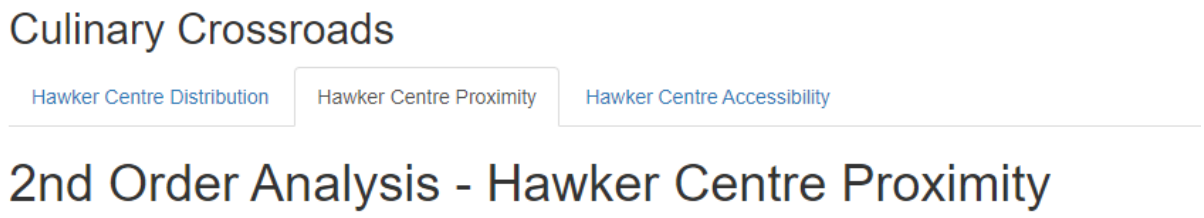
    b. Compare it to another example below, when we set the Kernel type to “Gaussian” and Bandwidth to “0.3”



    c. Based on the comparison, you would see that there is a difference in the way it presents the density on the map, depending on the Kernel and Bandwidth values.

Module 2: 2nd Order Analysis - Hawker Centre Proximity

1. Once you have accessed the shinyapp website, you will be able to see the navigation bar at the top of the site.
    a. Select “Hawker Centre Proximity”

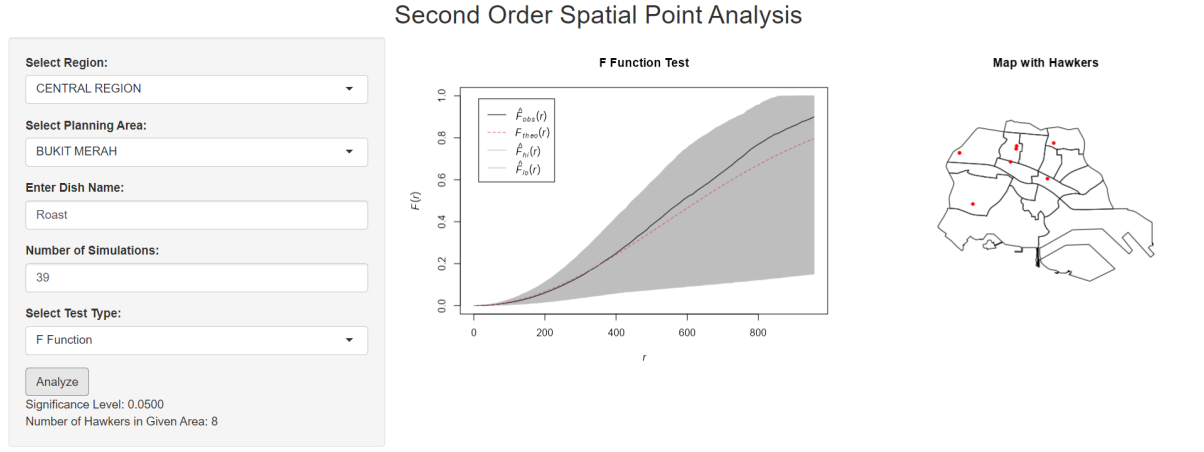


2. This module would allow you to filter distances between different stalls for a particular delicacy by region and planning area. One could conduct statistical tests to gauge potential clustering in different areas. To get things started, add the following settings

a. Select Region: Central Region
b. Select Planning Area: Bukit Merah
c. Enter Dish Name: Roast
d. Number of Simulations: 39 (Default setting, p-value = 0.05)
e. Select Test Type: F-Function

3. Click on the “Analyze” button upon entering the following inputs. It should display an output like the image below:

Figure 1: F-Function Test: Second-order spatial point analysis



On the right, a map would be displaying the location of all roasted meat stalls in Bukit Merah corresponding to which on the left panel, one could view the number of roasted-meat stalls in Bukit Merah as well as the significance level of statistical testing (This could be adjusted by increasing / decreasing the number of simulations)

The graph in the centre displays the graph of the F-function test comparing how f-function values increase with distance

Interpretation of different functions:

The F Function, also known as the Empty Space function, measures the distribution of distances from an arbitrary location (not necessarily a point) to its nearest observed point.

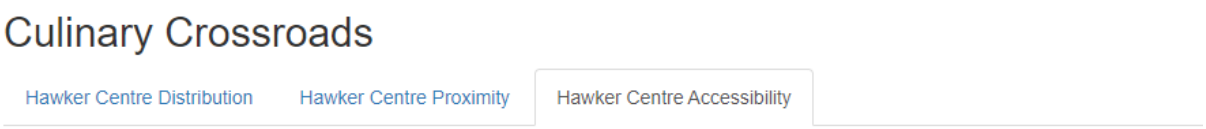
A monte-carlo simulation is conducted on the data to gauge complete spatial randomness in the data points. The maximum and minimum values obtained from the simulation are used to determine the confidence interval for the significance level as depicted by the grey area in the graph.

a. Ensure that both curves the one for a theoretical distribution (Ftheo(r)) and the one for actual observations (Fobs(r)) both are within the grey area (Ensures that we filter all statistically significant findings. All values being statistically significant implies that the distribution of Roasted Meat Stalls in Bukit Merah is not random.

b. If the observed F Function follows a concave upwards curve (increases slowly at first, then more rapidly at longer distances), it is imperative that the roasted meat stalls follow a clustered pattern. However, if the observed F function follows a concave downwards curve (increases rapidly at first, then more slowly at longer distances), we can say that the roasted meat stalls in Bukit Merah follow a more dispersed pattern.

Module 3: Geographic Accessibility Modelling of Hawker Centres

1. Once you have accessed the shinyapp website, you will be able to see the navigation bar at the top of the site.
    a. Select “Hawker Centre Accessibility”

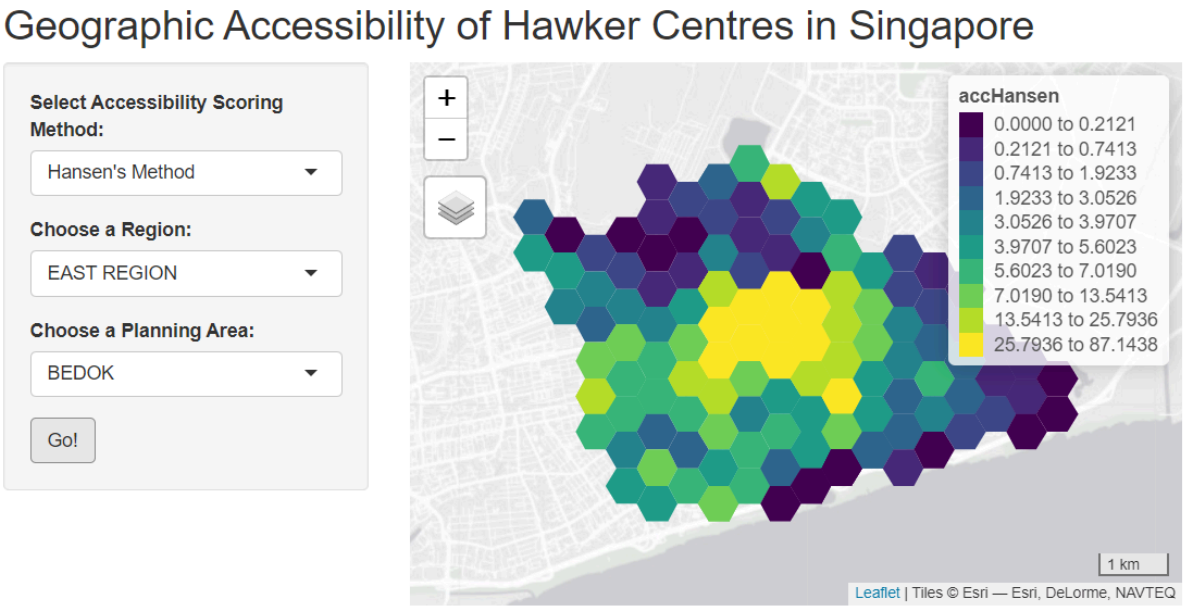


2. Begin by selecting the type of accessibility scoring method from the first dropdown (defaults to Hansen’s Method).

3. You can then select a specific region of Singapore on which to focus on, or you can select ‘ALL’ to see a complete map plot (regions defined by Singapore Master Plan; refer to Urban Redevelopment Authority website).

4. You can further specify a planning area (also defined by URA) corresponding to the region (filtered automatically), or choose ‘ALL’ to see a map plot of the whole region. You need not select a region before a planning area, though you will not see a filtered list of planning areas if a region is not first selected.

5. Pressing the “Go!” button will initialise the plot of hexagons for the selected query (defaults to ‘ALL’ for region and planning area). The scoring metric is displayed as a colour where dark blue represents a low score while bright yellow represents a high score, with high scores indicating greater accessibility of that location to a hawker centre/centres.



*Selecting “**Hansen’s Method**”, “**EAST REGION**” & “**BEDOK**”*

6. The plot will automatically update itself if different choices are selected from the dropdown lists.