

# User Guide: Visual Analytics of Spending & Kinematics (V-ASK)

A step-by-step guide on how to use Visual Analytics of Spending & Kinematics (V-ASK).

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## 1.0 Spending EDA

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### 1.1 Credit Card Data

Use this tab to explore credit card data.

1. Start by selecting a date range for the transactions. Then, select a bar from the bar chart. Doing so will modify the Credit Cards by Locations heatmap as well as the Transaction Values for Selected Location boxplot.

Exploratory Data Analysis based on Credit Card Data

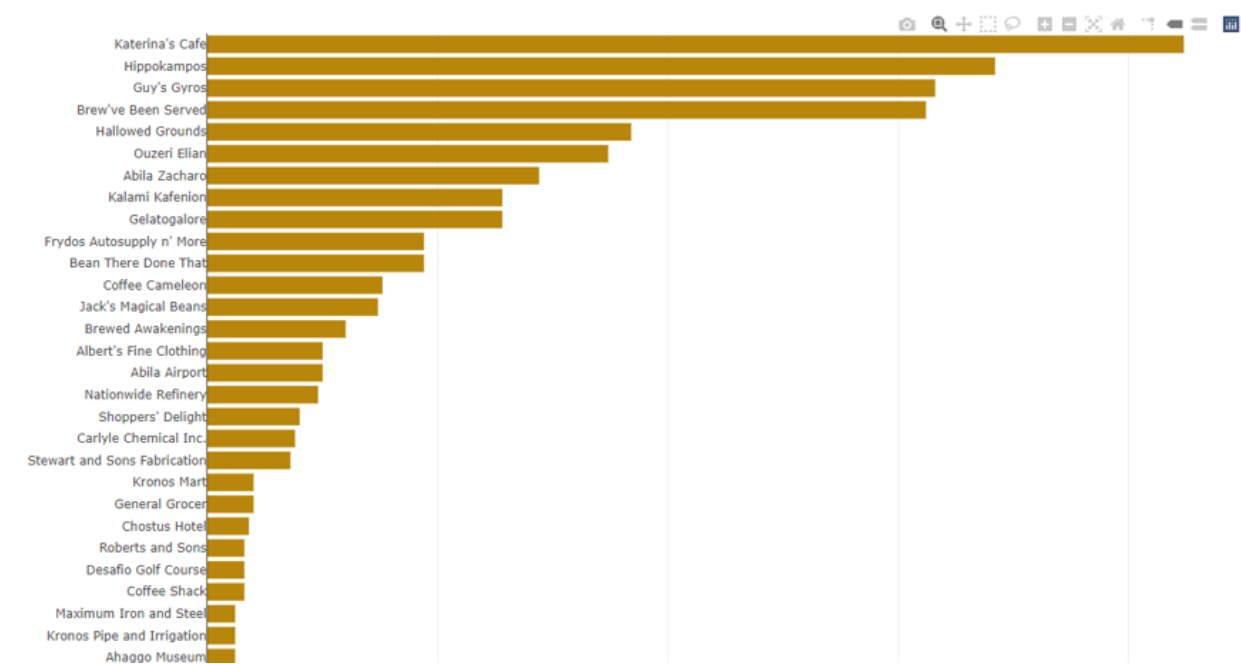
Select Date of Transaction:

06/1/2014

to

19/1/2014

Most Popular Locations by Frequency

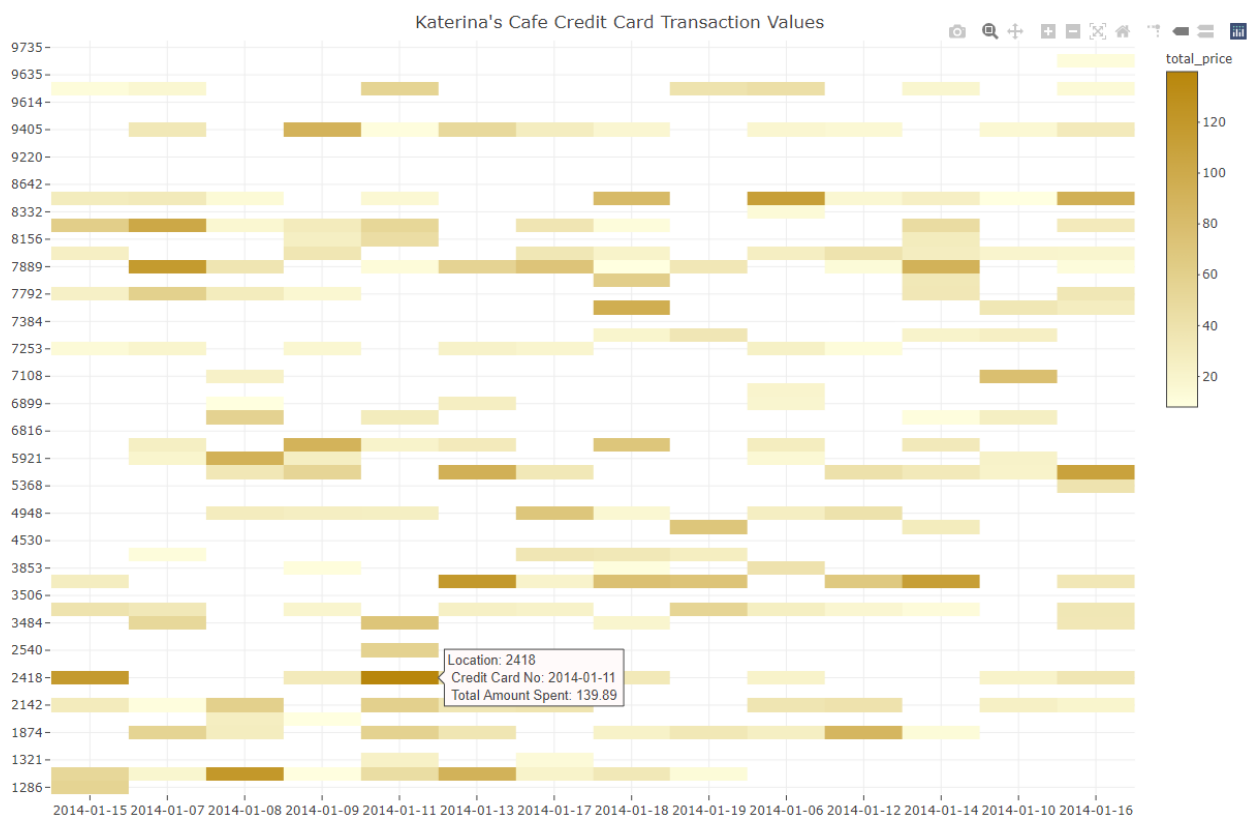




2. The Credit Cards by Locations heatmap will be filtered by the location chosen in step 1. Use the tooltip to explore the transactions in the heatmap.

### Credit Cards by Locations

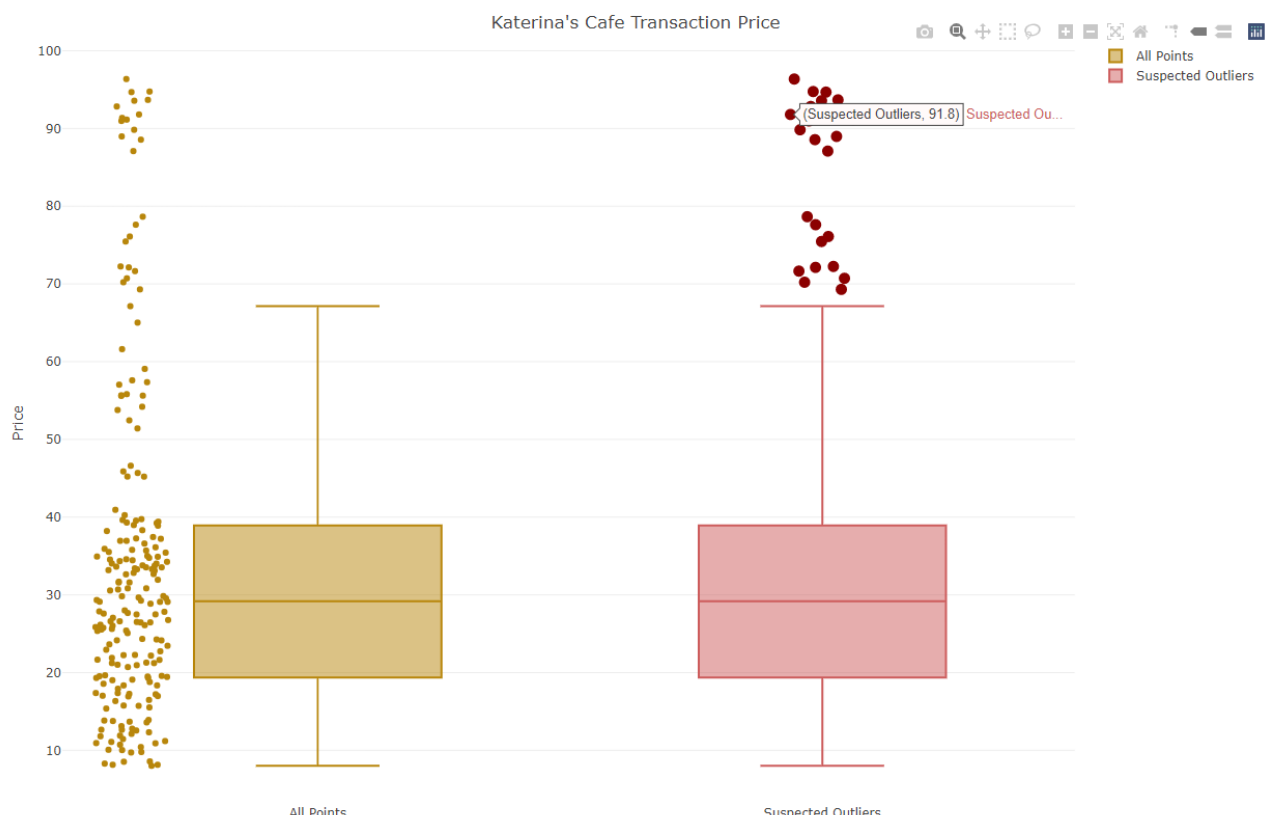
Click on barchart/heatmap location to show the credit card transaction



3. The Transaction Values for Selected Location boxplot will also be filtered by the location chosen in step 1. Check the boxplot for any suspicious transactions.

### Transaction Values for Selected Location

Click on barchart/heatmap location to show the transaction price



## 1.2 Loyalty Card Data

Use this tab to explore loyalty card data.

1. Start by selecting a date range for the transactions. Then, select a bar from the bar chart. Doing so will modify the Loyalty Cards by Locations heatmap.

### Exploratory Data Analysis based on Loyalty Card Data

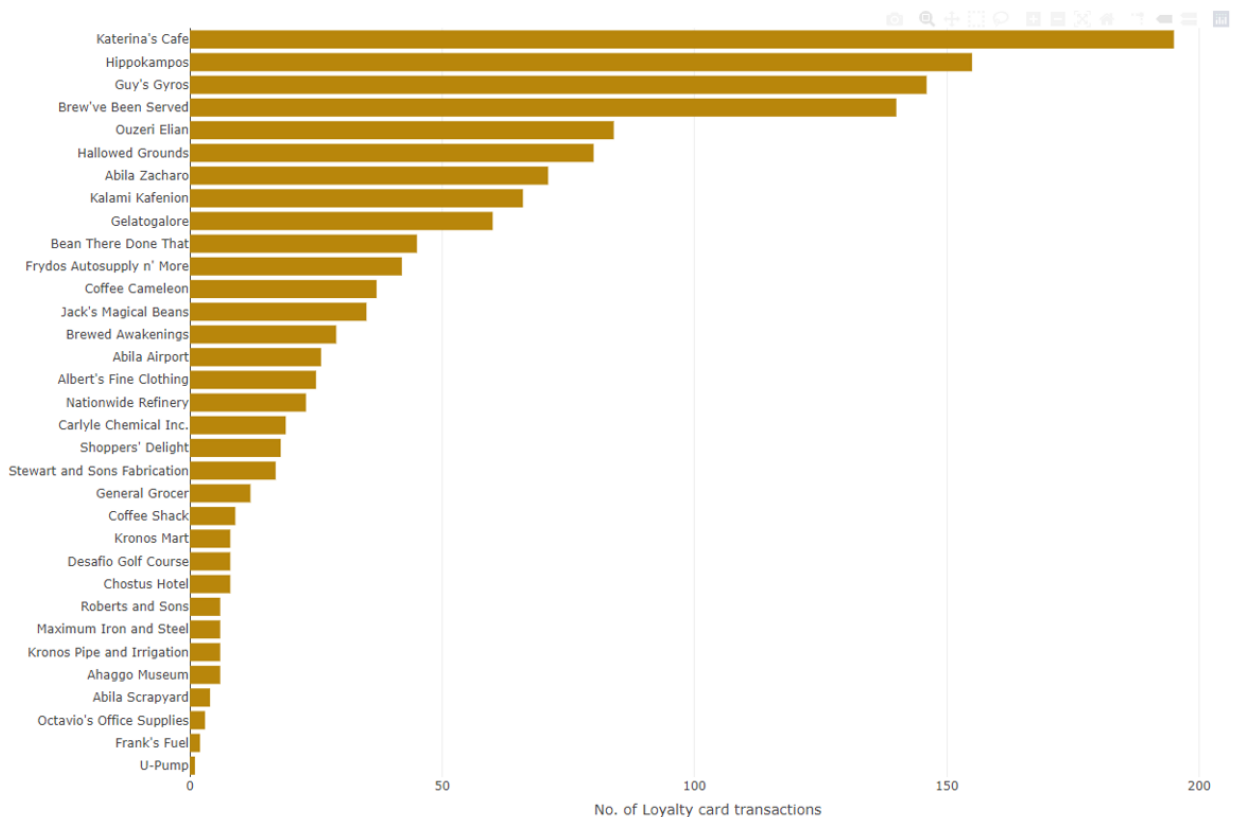
Select Date of Transaction:

06/1/2014

to

19/1/2014

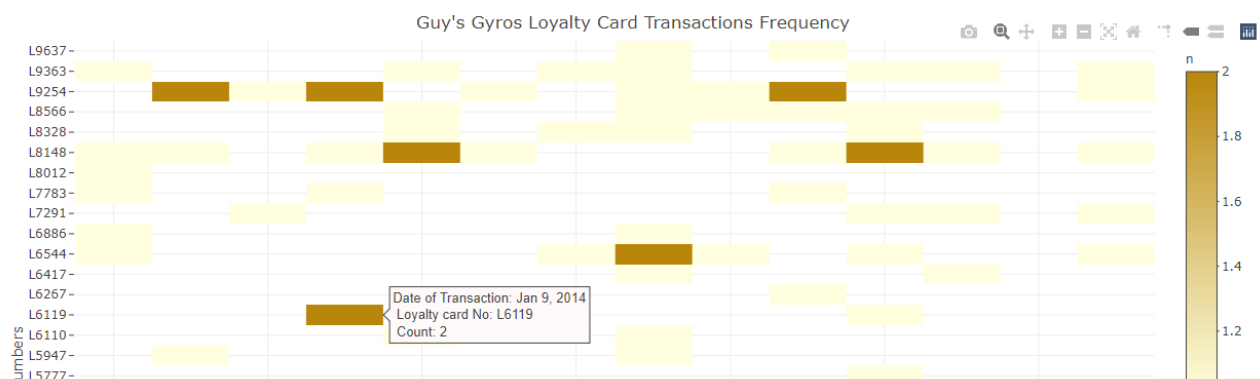
### Most Popular Locations by Frequency

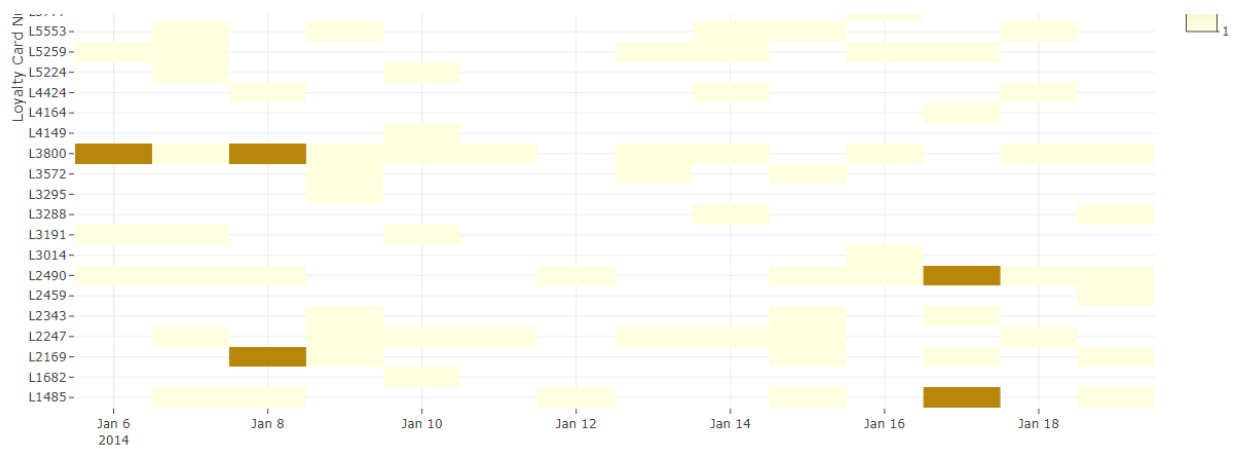


2. The Loyalty Cards by Locations heatmap will be filtered by the location chosen in step 1. Use the tooltip to explore the transactions in the heatmap.

### Loyalty Cards by Locations

Click on barchart/heatmap location to show the loyalty card transaction

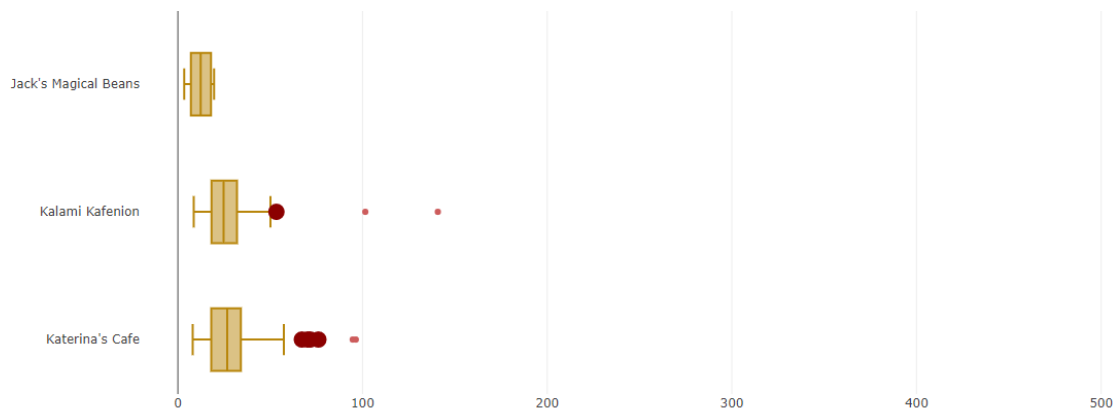




3. The Suspected Outliers for All Locations boxplot is not filtered by location. To see the details of the boxplot, use the zoom feature.

Suspected Outliers for All Locations

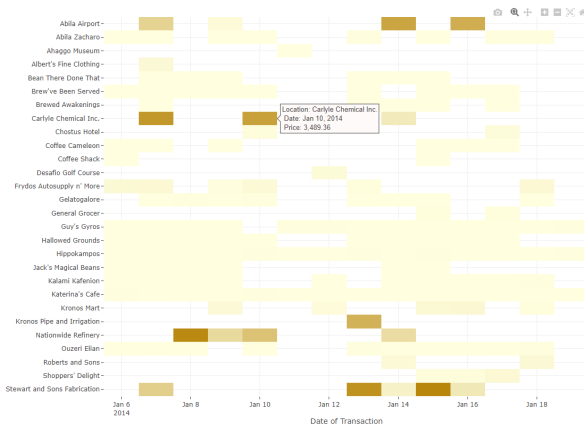




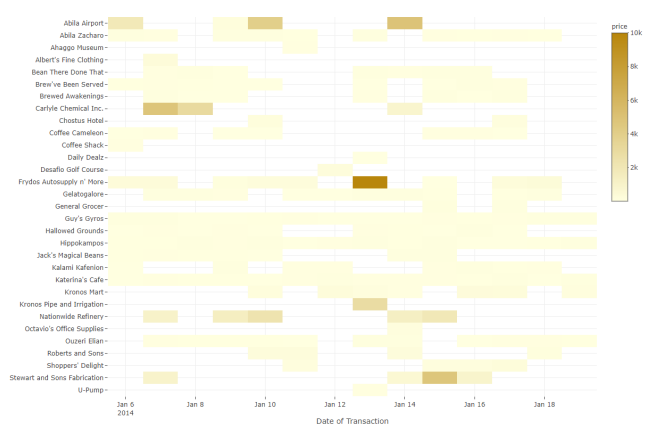
## 1.3 Credit Card + Loyalty Data

Use this tab to see locations and days where credit card and loyalty card transactions could not be matched to its corresponding loyalty card and credit card transaction.

Missing Credit Card Transaction



Missing Loyalty Card Transaction



## 2.0 Patterns of Life Kinematics

### 2.1 GPS Movement

Use this tab to understand patterns of life: where people go, what time, and for how long.

The tab defaults to car ID 1, date range January 6, 2014 - January 19, 2014, and 0:00 to 24:00 hours.

1. Select the car ID(s), date range, and time you want to explore.

GPS MOVEMENT QINNESS IDENTIFICATION CREDIT CARD AND LOYALTY MATCHING

Vehicle Paths and Points of Interest

Set Parameters of GPS Movement Data

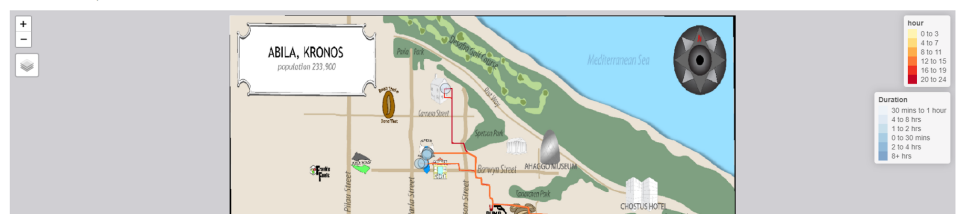
Select Car ID(s):

Select Date:  to

Select Hour of Day:  to

Explore the daily routine of GASTech Employees based on their GPS tracking data

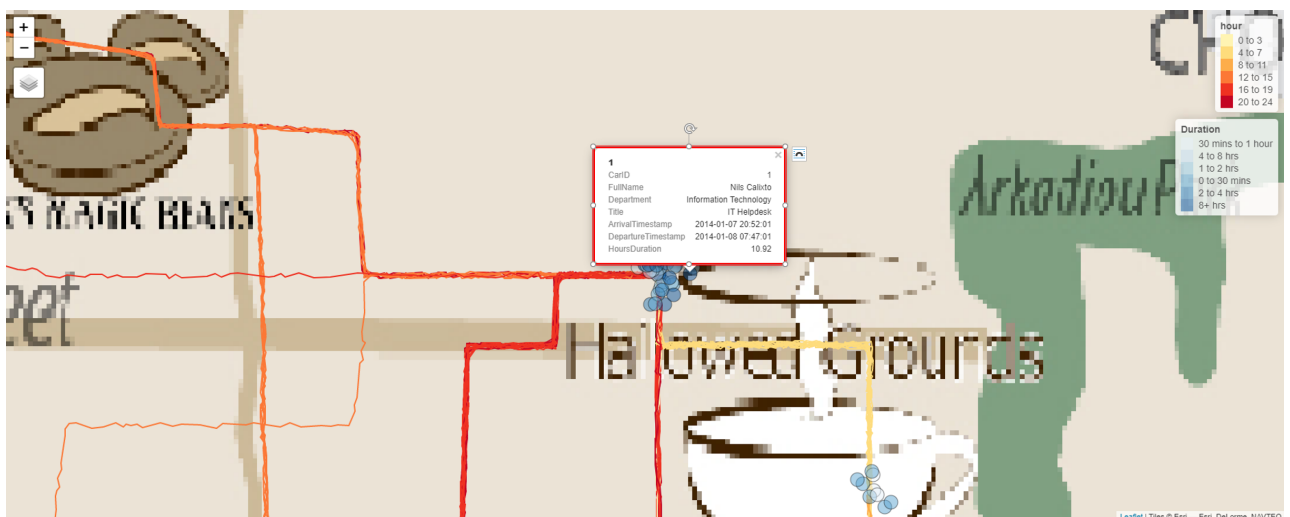
Note that the interactive map takes some time to load





2. Zoom in to see the POIs more closely. By zooming in, you can see the distribution of POIs (whether there's few or many) and the colors of the POIs which indicate duration become more distinct.

3. Hover over individual POIs to see details about the person, their arrival, departure, and time spent at that location.

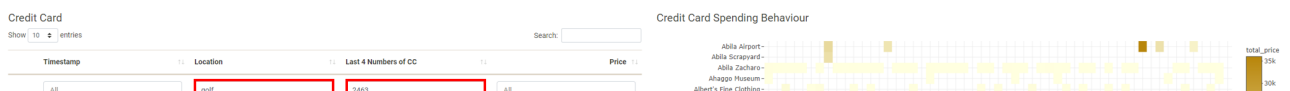


## 2.2 Owners Identification

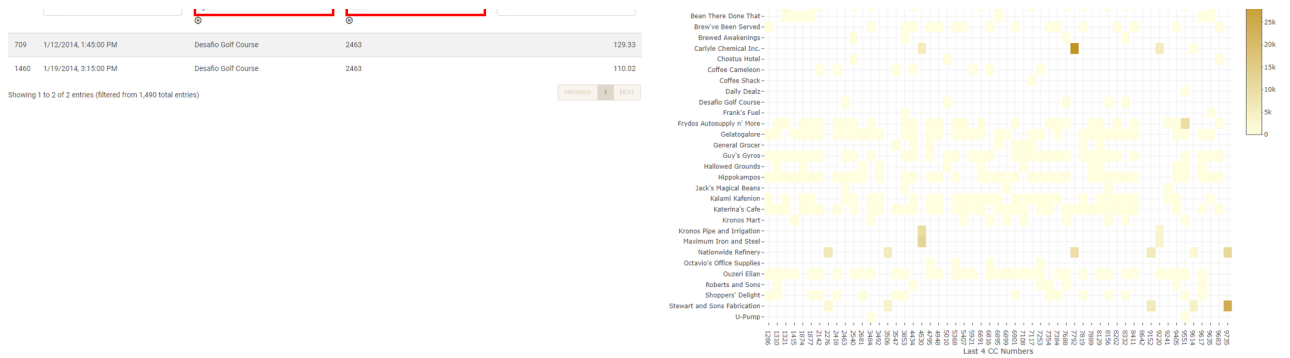
Use this tab to identify the likely owners of each credit card.

1. There are several ways to start. We will walk through one approach that has worked well for us. First, filter for one credit card using the data table filter. Second, filter for a location using the data table filter. Locations that are less popular work best. The heatmap is useful for finding the best locations to use.

Step 1:  
Explore the credit card transaction and take note of the timestamp



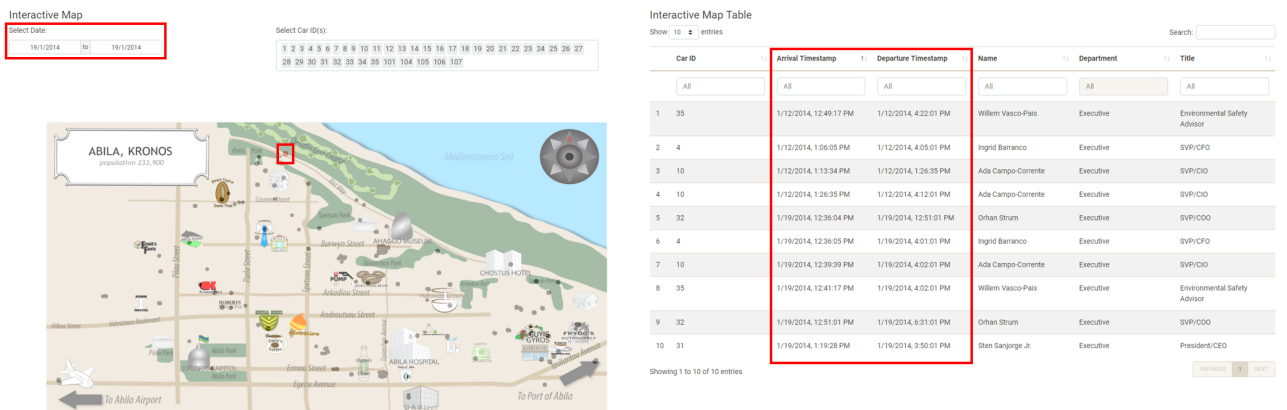




2. Use the date filter for the map to narrow down the POIs that match the date of the transaction from step 1. Use the lasso selection tool to select the POIs near the location from step 1. The data table on the right will surface the details of POIs selected.

Step 2:

Based on the credit card number and timestamp, use the date filter to narrow down the transactions. Use the 'Lasso Select' to focus on particular location which will then update the Interactive Map Table.

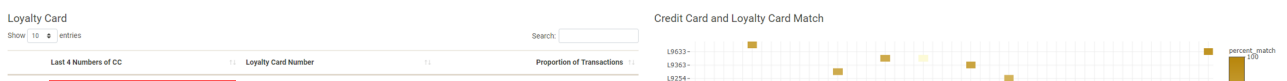


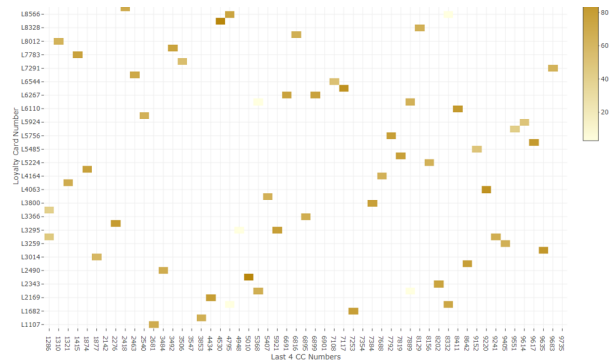
3. To match the credit card with the POI, compare the transaction time with the arrival and departure times. The transaction time should fall between the arrival and departure times. It is possible that multiple people meet this condition. They are candidates for possible owners of the credit card. To further narrow down the list of candidates, iterate through steps 1 and 2 using different transactions. The last candidate is the likely owner of the credit card.

4. The last step is to match the credit card with the loyalty card. Use the data table filter to filter for the credit card. The data table will show the loyalty card(s) that match based on a joined table using transaction details (date and price).

Step 3:

Use the table below to identify the best match Credit Card and Loyalty Card





## 2.3 Credit Card and Loyalty Card Matching

This tab has the matching results from Owner Identification module.

# 3.0 Relationship Networks

## 3.1 Organizational Chart

Use this tab to explore the organizations and employees in GASTech.

- 1. Click on any node in the tree to expand it.
- Official Relationships of GASTech Employees based on Company Organization Chart
- Explore the Relationship of GASTech Employees according to Department and Title



2. The table is interactive with the tree. To hide the table, click on the checkbox.

Selected Nodes:

Click the nodes to select

```
$Title
[1] "Perimeter Control"

$Department
[1] "Security"
```

☒ Check to view Company Details

Show 10 entries

Search: Perimeter Control

CarID	Department	Title	FullName
16	Security	Perimeter Control	Isia Vann
21	Security	Perimeter Control	Hennie Osvaldo
24	Security	Perimeter Control	Minke Mies
34	Security	Perimeter Control	Edvard Vann

Showing 1 to 4 of 4 entries (filtered from 44 total entries)

PREVIOUS 1 NEXT

## 3.2 Spending Habits

Use this tab to explore unofficial relationships between GASTech employees.

1. There are several filters on this view: date, hour, day of week, and department. We recommend starting with the default filters to get a high level view and using the filters to hone in on specific relationships.

Unofficial Relationship of GASTech Employees based on Credit Card Data

Set Parameters of Credit Card Data

Select Date of Transaction:

06/1/2014 to 19/1/2014

Select Hour:

0 3 6 9 12 15 18 21 24

Select Day of the Week:

Mon Tue Wed Thu Fri Sat Sun

Select GASTech Employee Department

Select Department:

Executive Engineering Facilities  
Information Technology Security  
Unknown

Department Color Legend

Executive

Explore the Relationship of GASTech Employees according to Purchase Location

Select Network Layout:

layout\_with\_fr

Select by id



Engineering  
Facilities  
Information Technology  
Security  
Unknown



2. Select the network layout to use. Play around with this setting to see how your network is visualised. We recommend testing layout\_with\_fr and layout\_nicely.

Unofficial Relationship of GASTech Employees based on Credit Card Data

Set Parameters of Credit Card Data

Select Date of Transaction:

06/1/2014 to 19/1/2014

Select Hour:



Select Day of the Week:

Mon Tue Wed Thu Fri Sat Sun

Select GASTech Employee Department

Select Department:

Executive Engineering Facilities  
Information Technology Security  
Unknown

Department Color Legend

Executive

Engineering

Facilities

Information Technology

Security

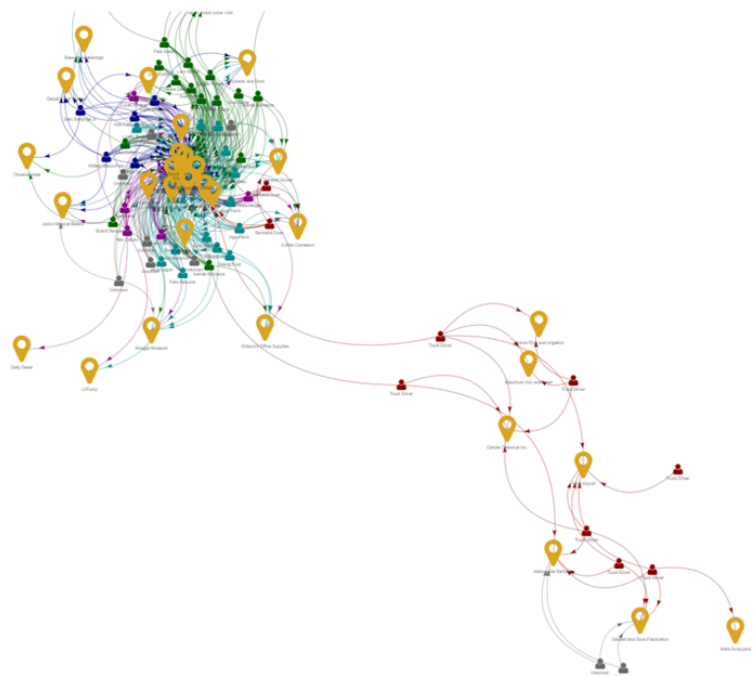
Unknown

Explore the Relationship of GASTech Employees according to Purchase Location

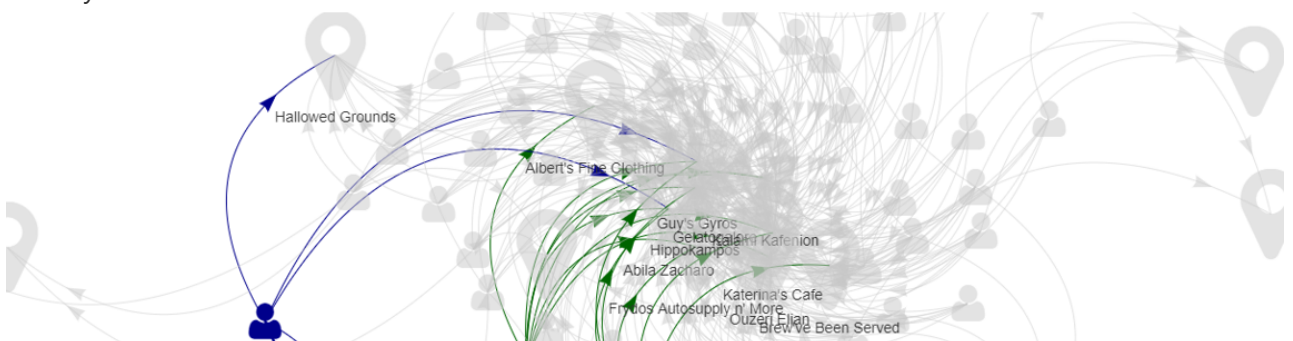
Select Network Layout:

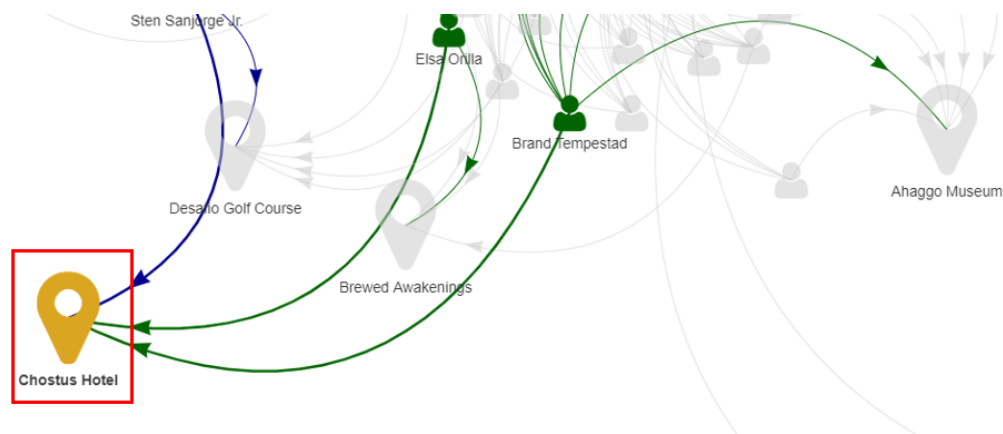
layout\_with\_fr

Select by id



3. To interact with the network graph, use the select by id drop down or click on the network graph directly.





4. Interacting with the graph will generate a data table with details of the transactions that occurred at that location.

Employee Name	Title	Timestamp	Day	Location	Last 4 CC Numbers	Price
Elsa Orilla	Drill Technician	1/8/2014, 12:56:00 PM	Wed	Chostus Hotel	2540	107.51
Brand Tempestad	Drill Technician	1/8/2014, 1:19:00 PM	Wed	Chostus Hotel	9683	111.89
Brand Tempestad	Drill Technician	1/10/2014, 1:08:00 PM	Fri	Chostus Hotel	9683	133.25
Elsa Orilla	Drill Technician	1/10/2014, 1:11:00 PM	Fri	Chostus Hotel	2540	197.41
Elsa Orilla	Drill Technician	1/14/2014, 1:17:00 PM	Tue	Chostus Hotel	2540	109.54
Brand Tempestad	Drill Technician	1/14/2014, 1:21:00 PM	Tue	Chostus Hotel	9683	113.08
Brand Tempestad	Drill Technician	1/17/2014, 1:49:00 PM	Fri	Chostus Hotel	9683	114.22
Elsa Orilla	Drill Technician	1/17/2014, 1:54:00 PM	Fri	Chostus Hotel	2540	159.62
Sten Sanjorge Jr.	President/CEO	1/18/2014, 12:03:00 PM	Sat	Chostus Hotel	5010	600

Showing 1 to 9 of 9 entries (filtered from 1,540 total entries)