

Exercise 8: Boston Home Trends

Intermediate Analytics

Objectives

1. Practice leveraging Tableau’s Analytics pane to summarize data and create custom graphs
2. Apply parameters and tool tips to visualizations
3. Use clustering techniques to group your data

Reference Lines

1. Open the Tableau starter workbook called **Exercise 8: Boston Homes Starter** in the Exercise Starter Workbooks folder. In the Data Source tab notice that all fields in this dataset are continuous measures. Look at the data dictionary below to become familiar with what the field names represent.

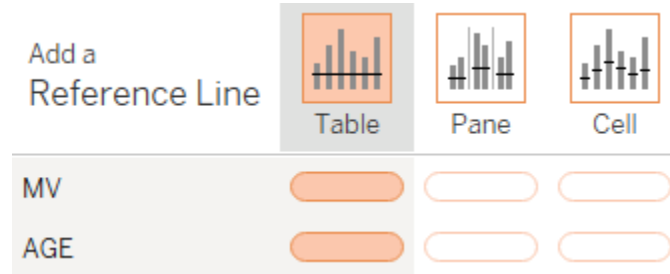
Field	Description
Crim	per capita rate by town
ZN	proportion of residential land zoned for lots over 25,000 sq.ft.
Indus	proportion of non-retail business acres per town
Chas	Charles River dummy variable (= 1 if tract bounds river; 0 otherwise).
NOX	nitrogen oxides concentration (parts per 10 million).
RM	average number of rooms per dwelling.
AGE	proportion of owner-occupied units built prior to 1940.
DIS	weighted mean of distances to five Boston employment centers.
RAD	index of accessibility to radial highways.
TAX	full-value property-tax rate per \$10,000
PT	pupil-teacher ratio by town
Lstat	Lower status of the population (percent)
MV	Median value of owner-occupied homes in the \$1000s

2. Quadrant analysis will be performed on the Boston Homes data to capture crime rate trends for a range of home prices/ages. We will leverage Average lines to get started. Navigate to Sheet 1 and drag **MV** onto columns and **AGE** onto rows. Uncheck **Aggregate Measures** under the analysis tab to display all data points.



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3. Navigate to the Analytics pane and drag **Reference line** to the view. Hover over the table selection and ensure both **MV** and **AGE** are highlighted. This will provide an average for both x and y values, giving the quadrants we were looking for.



4. From the Edit Reference Pane, change label to **value** and select ok.

Notice that Tableau now has generated average values for both Age of home and Market value. One can break this down into four quadrants with a center avg point.

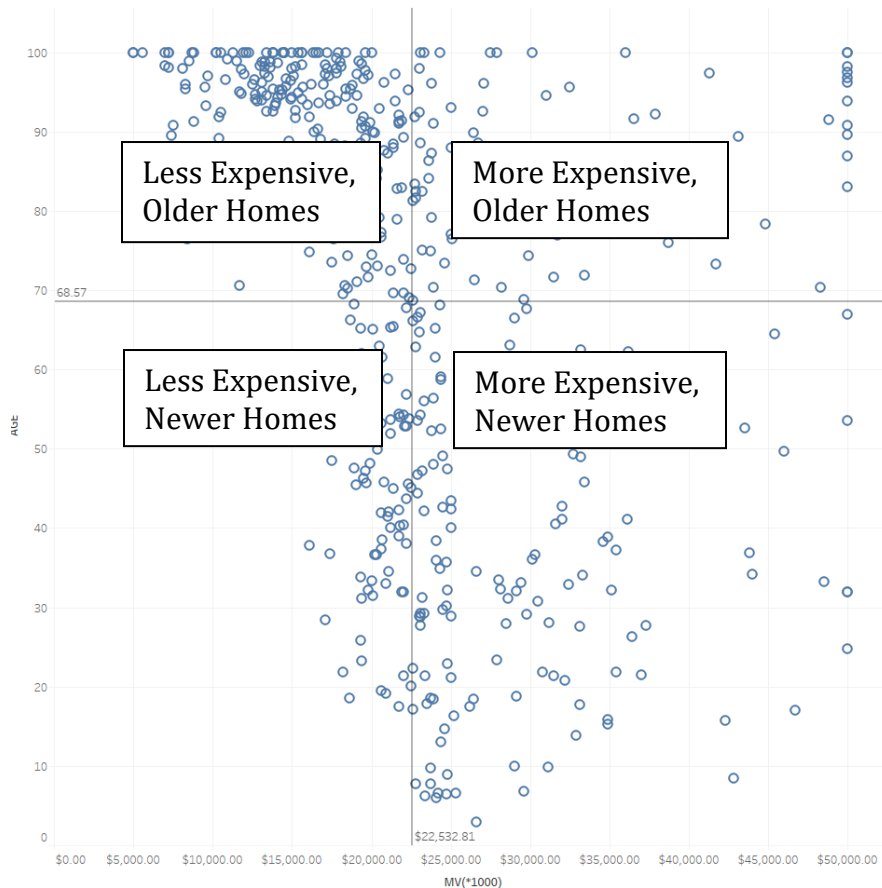


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5. Now let's see the relation between **crime rate** and **housing**. Drag Crim on color. This gives us an indication that higher crime occurs in older homes with less value, but it does not allow us to have any control over this detail.
6. Let's use a Crime **parameter** to give the viz more flexibility! Right click on **Crim** and create a parameter. Click ok and display the **parameter control** for later use.
7. Now, create a **calculation** that will control your crime rate to be =< a selected value on your crime parameter.

Crime Rate Control
✕

```
If [Crim] >= [Crim Parameter] THEN 1 ELSE 2 END
```

The calculation is valid.
1 Dependency ▾

8. Drag the new calculation onto **color** and **shape**, allowing these marks to stand out from the rest.

Marks

○□ Automatic ▾

●●● Color	○ Size	T Label
○○○ Detail	□ Tooltip	○□ Shape

●●● Crime Rate Control

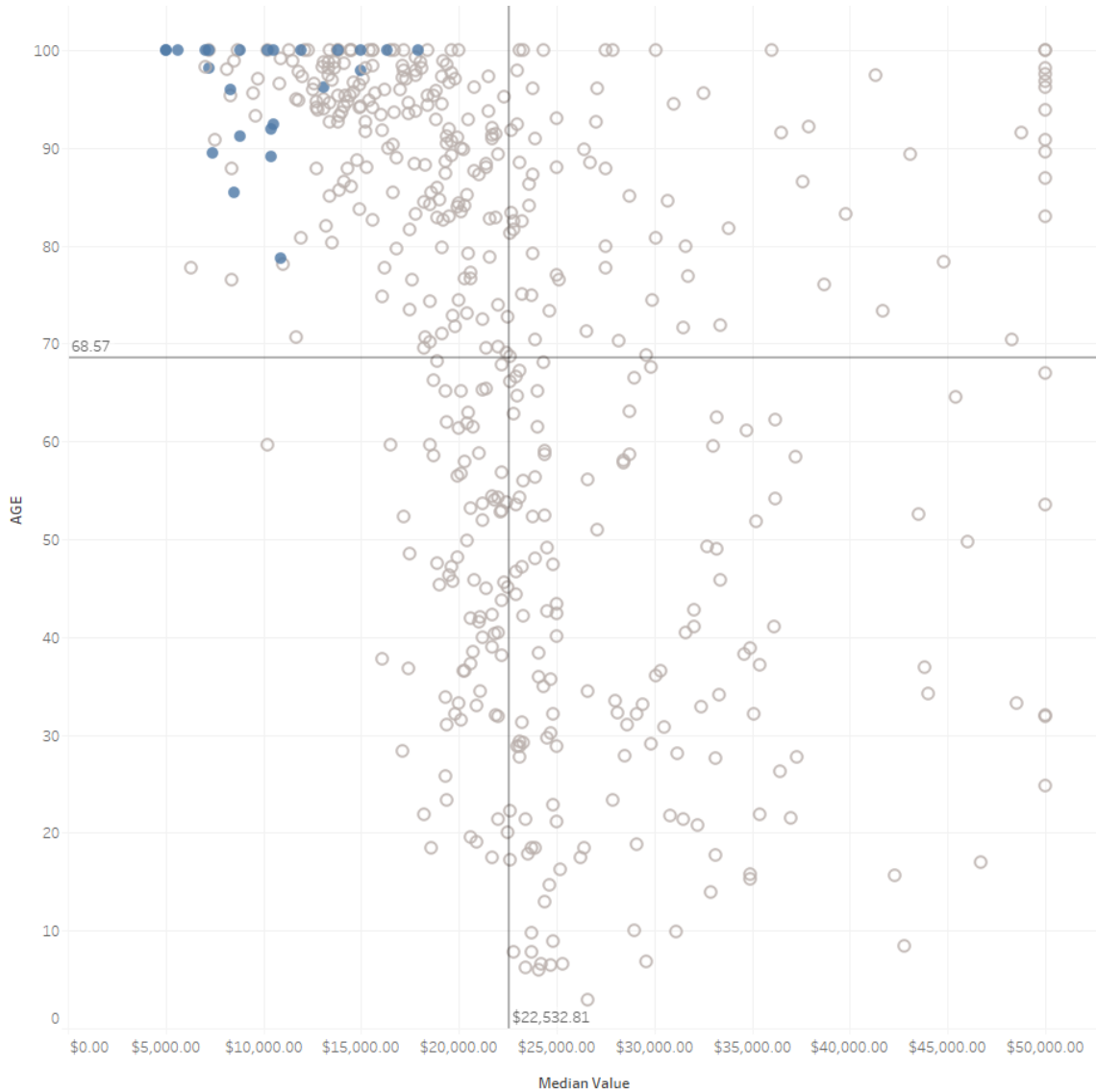
○□ Crime Rate Control

Crim Parameter

2.276186779



Question 1: What conclusion can you make based off the data when setting the crime parameter to 10? How about less than 1? (Hint: toggle between slider and type in for ease of use)



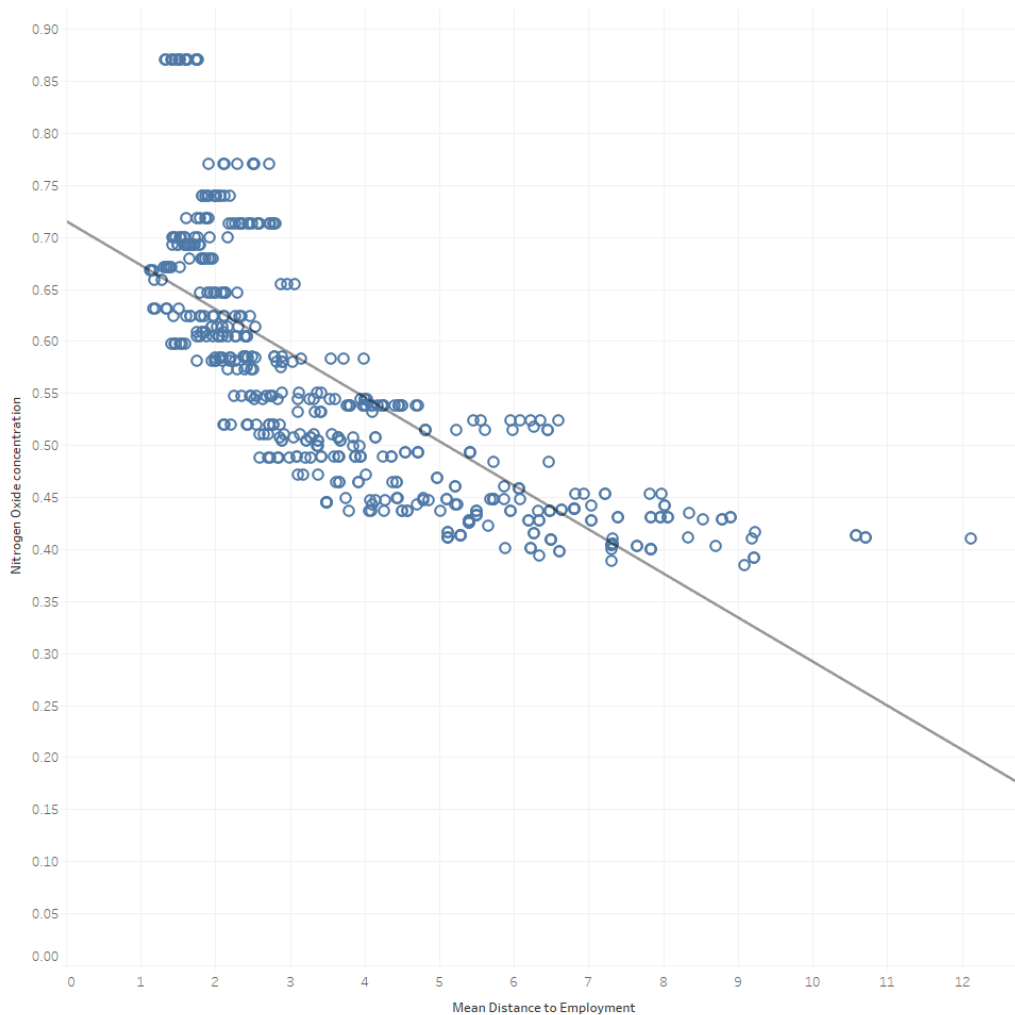
Trends and Box Plots

1. Now let's show the correlation between **pollution** and **distance to workplaces**. First make an x, y scatter with **DIS** on the columns shelf and **NOX** on the rows shelf.



- From the analytics pane under Model drop a trend line to the view.

Question 1: What is the trend between distance to work places and pollution levels? What is the slope of our trend line?



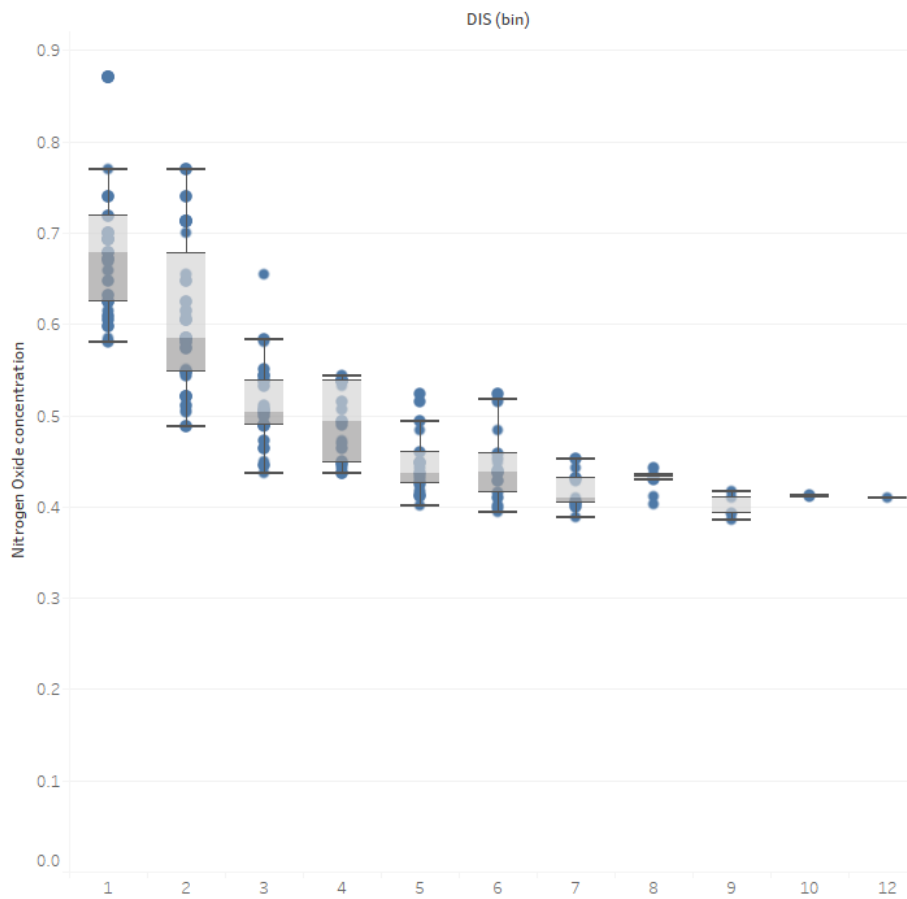
- Now let's show this data as box plots. Box plots give a standardized way to display the distribution of our data. To create a box plot we will need to first separate data into different bins. Bin **Distance** by size of 1 and replace dis on



columns with this new bin field. This gives us a discrete dimension to work with, which is necessary for creating a box plot.

- Now replace the mark type with smaller sized circles and drag over **box plot** from the Custom table on the **analytics pane**.

What can you now determine using a box plot that wasn't possible with the previous scatter plot? _____



Clustering

- Clustering is a great way to **group** continuous dimensions. Let's create crime rate clusters over distance to workplaces. First make an x, y scatter with **DIS** on the columns shelf and **Crim** on the rows shelf. Be sure to uncheck aggregate data under the analysis tab.
- Double click on **cluster** under Model on the Analytics pane. By default Tableau includes all fields applied to the x, y in the cluster and assigns a

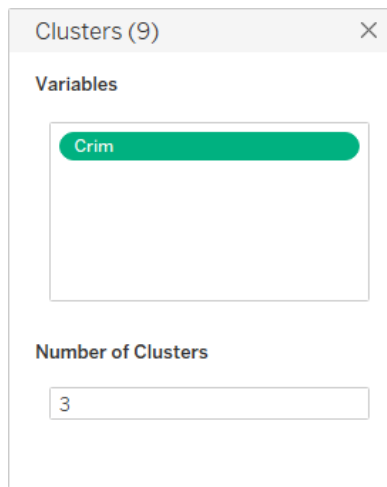



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default number of clusters. For this exercise, break out crime rate into **three** different categories

- Cluster 1: Low Crime Rate
- Cluster 2: Mid Crime Rate
- Cluster 4: High Crime Rate

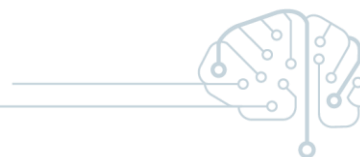
3. Edit Tableau's default clustering and take **DIS** out of the variables box. Now, Under number of clusters type **3**.

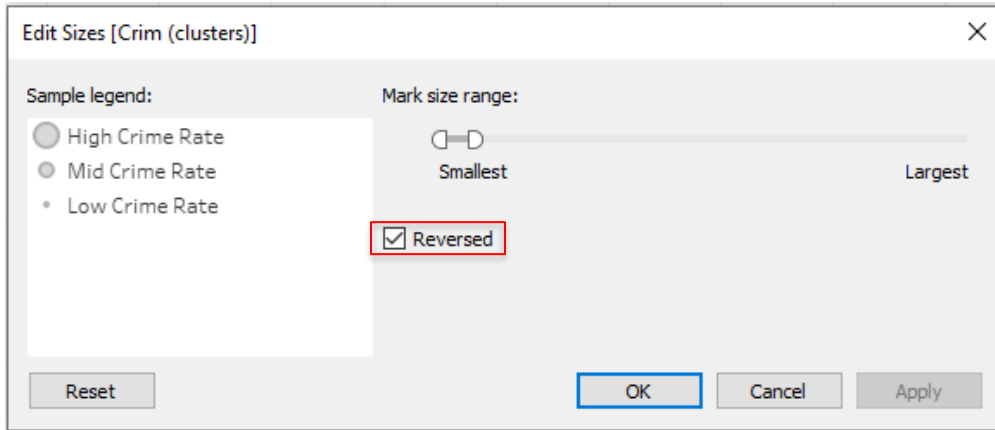


4. Now drag clusters from the Marks card to the **Dimensions pane**. Notice how Tableau handles clusters. 
5. Apply the new **Crim (cluster)** to color and size on the marks card.



6. You now can edit the cluster **Aliases** to match corresponding crime rate names and reverse the size from the Crime Cluster **size legend**.





Custom Tool Tips

- Let's use the cluster coloring scheme to create a custom tool tip. A tooltip best practice is to have your data displayed in sentence form. Start by creating the following tool tip.

<Crim (clusters)>

With a **<Crim>** crime rate at a **<DIS>** mean distance.

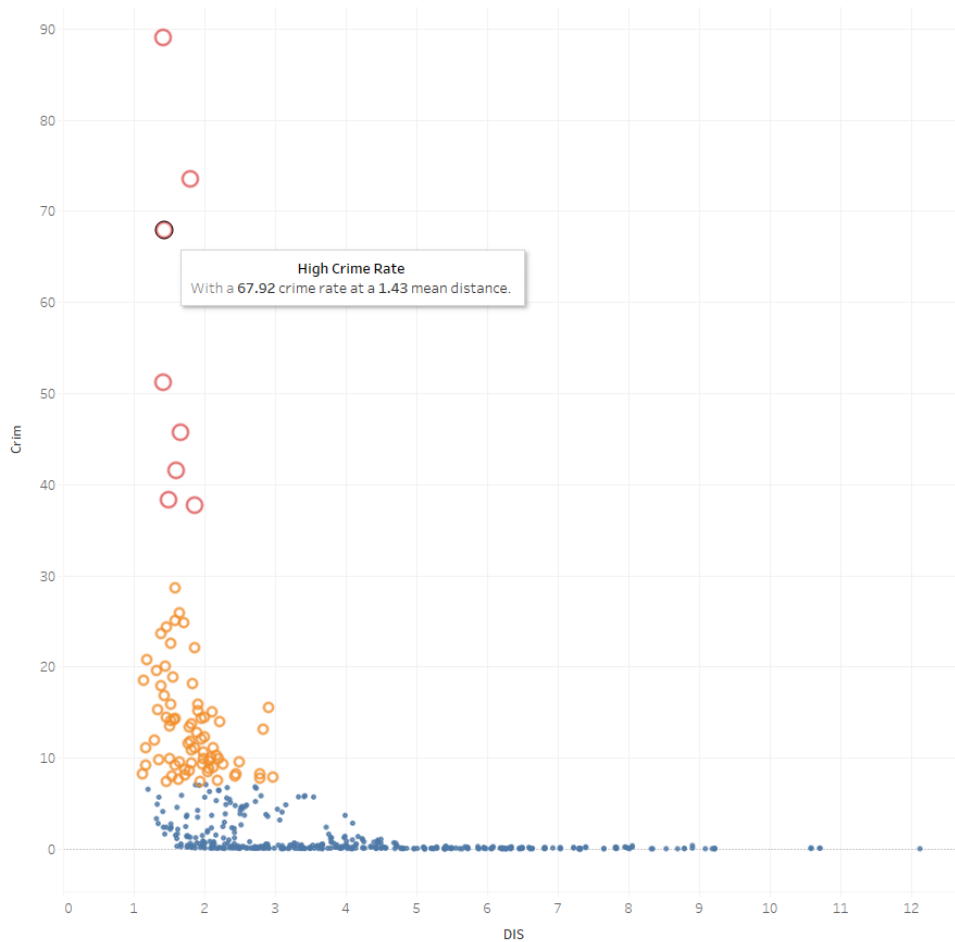
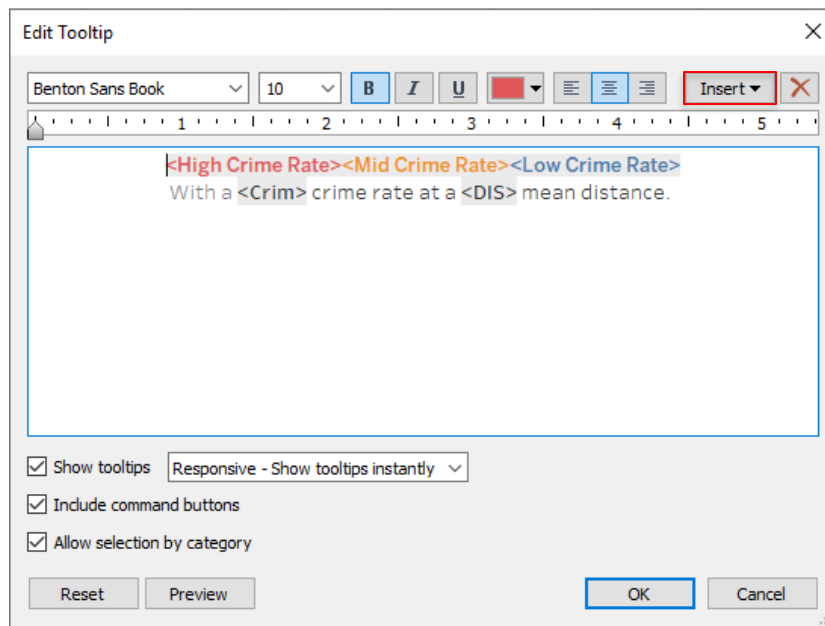


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- To have custom colors depending on what cluster we are hovering over, if statements will need to be created.

Create the following **calculated field** for all **three** crime rates:
 IF [Crim (clusters)] = "High Crime Rate" THEN [Crim (clusters)] END

- To access these fields from your tooltip edit box, you will need to add the calculated fields to the view. Drag these calculations to either **Detail** or **Tooltip** in the marks card. Tooltips only allow you to insert fields that have been added to the current view.
- From the edit tool tip window select the **insert** drop down and add the three calculated fields to the tool tip view. Now color code them based off the cluster colors.



Hover over a mark in the x, y grid and see your new tooltip in action.



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