

Insights for ArcGIS- Intro

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ESRI PETROLEUM GIS CONFERENCE

Agenda

- What's is Insights?
- Getting started with Insights
- Demonstration
- Road Ahead

Powerful analysis made simple

- Visual, intuitive, and interactive

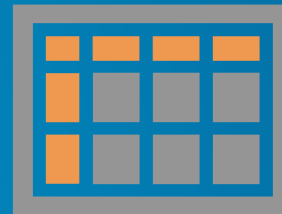
Analysis methods presented as questions

The screenshot shows a software interface for analytics. At the top, there is a blue header with the word 'Analytics' and a close button. Below the header, there are two tabs: 'Find answers' and 'Spatial analysis'. Under the 'Spatial analysis' tab, there is a list of questions: 'How is it distributed?', 'How is it related?', 'What's nearby?', and 'How has it changed?'. Each question is separated by a horizontal line.

This screenshot shows a dashboard with three main options: 'Map', 'Chart', and 'Table'. Below these options, there is a 'Coordinates' input field with a location pin icon and a plus sign. A blue arrow points from this input field towards the map view on the right.

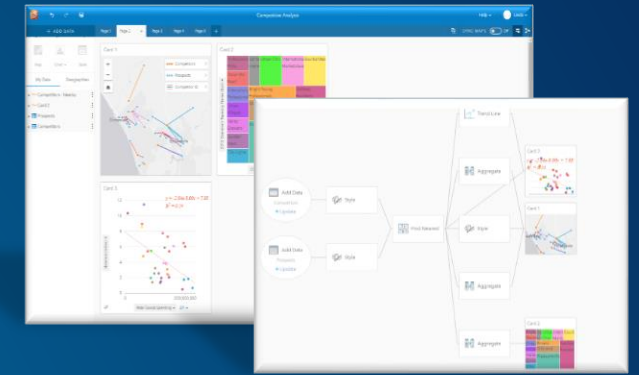
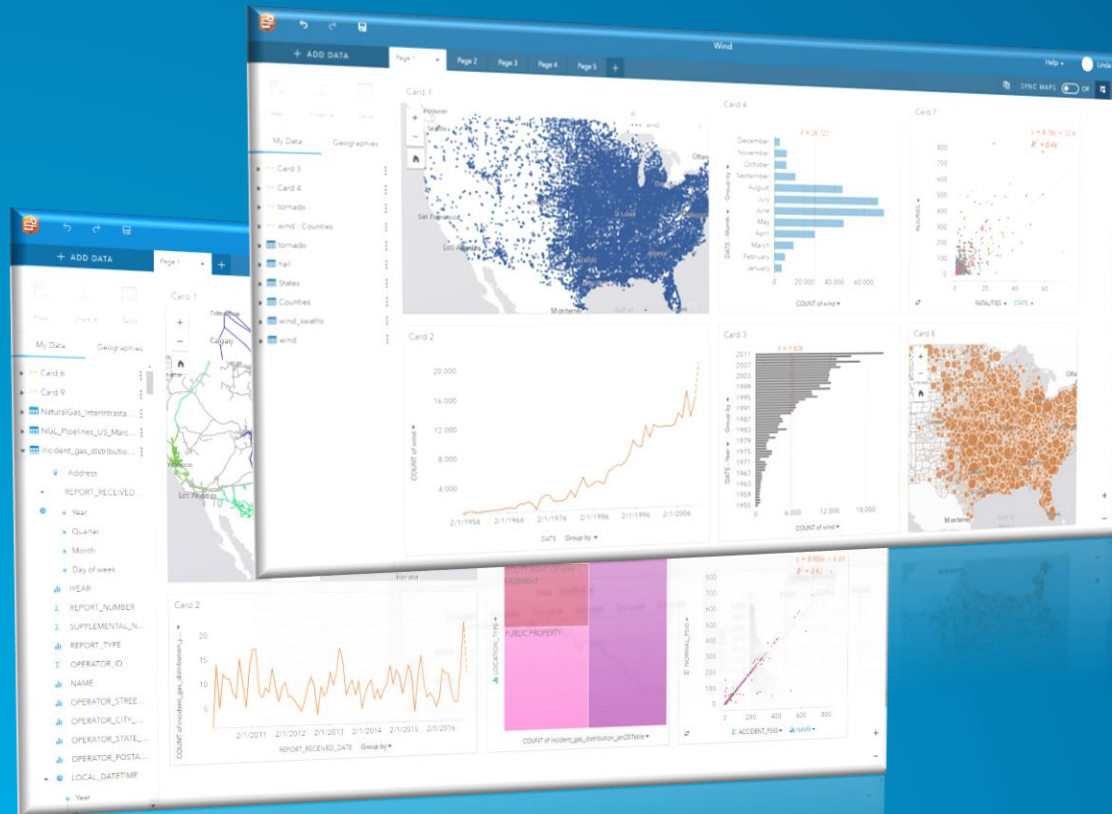
Smart defaults

Drag-n-Drop



This screenshot shows a map view titled '911 Calls by Census Block'. The map displays various census blocks in different colors. There are several analysis options visible: 'Add new layer', 'Coordinates' (with a location pin icon), 'Spatial aggregation', and 'Filter by selected feature'. A blue arrow points from the 'Coordinates' input field in the dashboard above to the 'Coordinates' input field on the map.

Insights for ArcGIS: Explore a new world in your data



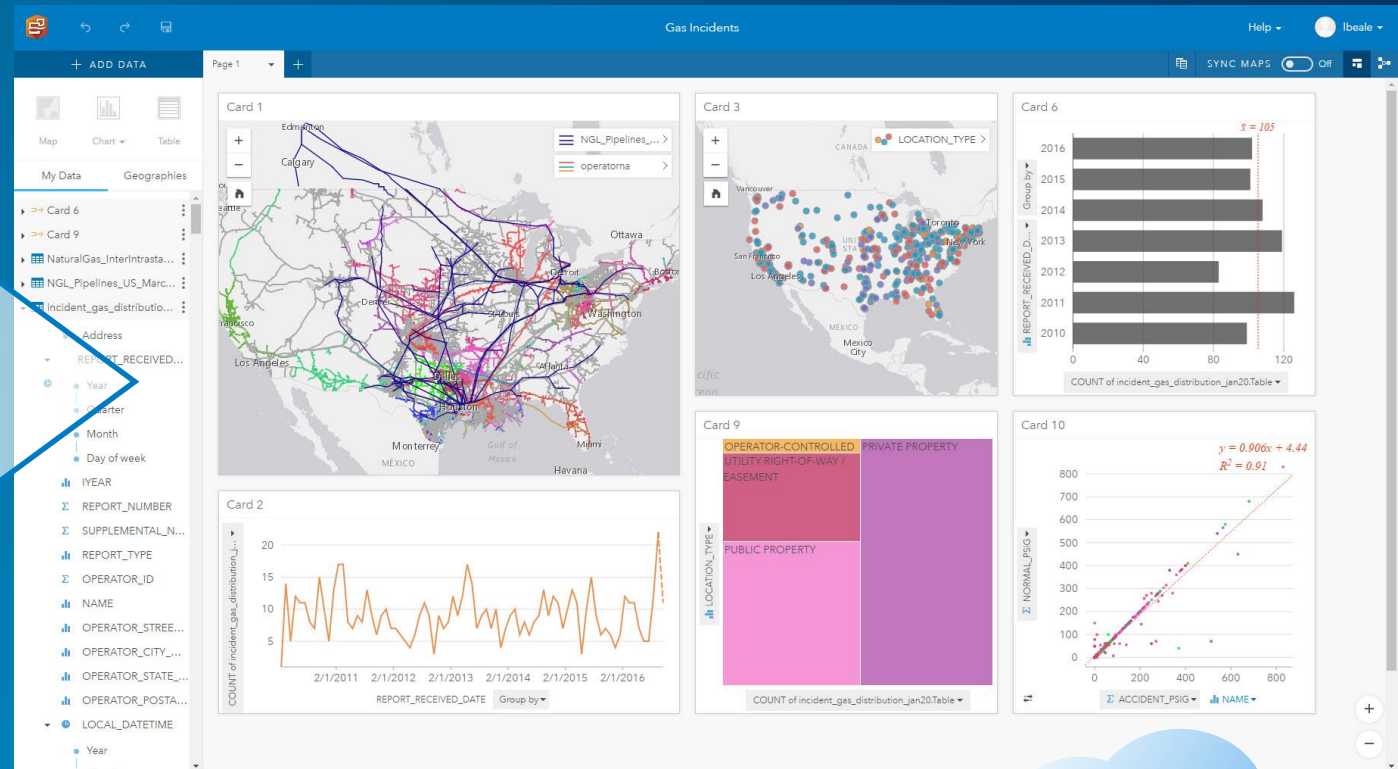
- Discover the power of exploratory analysis
 - Visual and intuitive
- Combine Analysis and Visualization on cards
 - Linked and responsive
- Drive impactful decisions
 - Learn, record, share and collaborate

Working with data

Data: multiple data sources

Data -
Spatial and
Tabular

Visualization
& Analysis



Insights page in ArcGIS



Working with your data

Data pane

Shape field → Location

Numeric → dc_dist

→ sector

Categorical → dispatch_date_time

Date/time → dispatch_date

Date components → Year, Quarter, Month, Day of month, Day of week, Hour, Minute

→ crime_id

→ address

→ crime_type

→ crime_sub_type

→ point_x

→ point_y

Map Chart Table

Dataset → Retail_Stores

Result dataset → Calculate Density 1 **NEW**

Indicates card-dataset connections →












Hierarchy → Retail_Stores

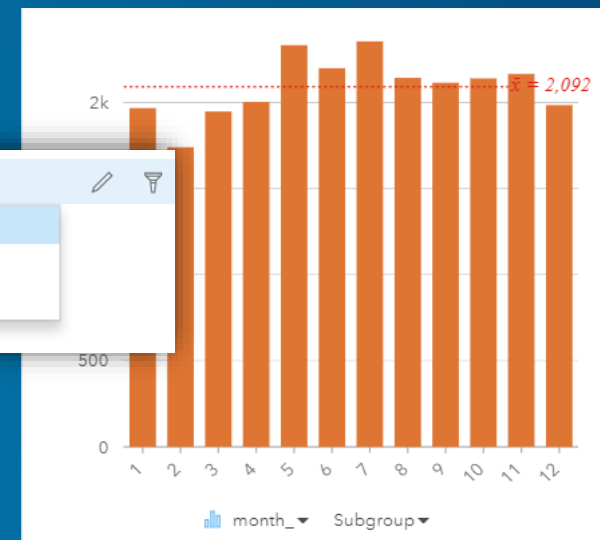
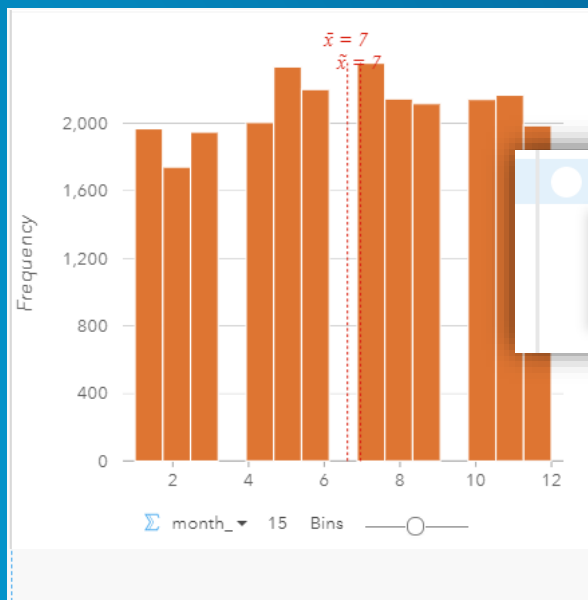
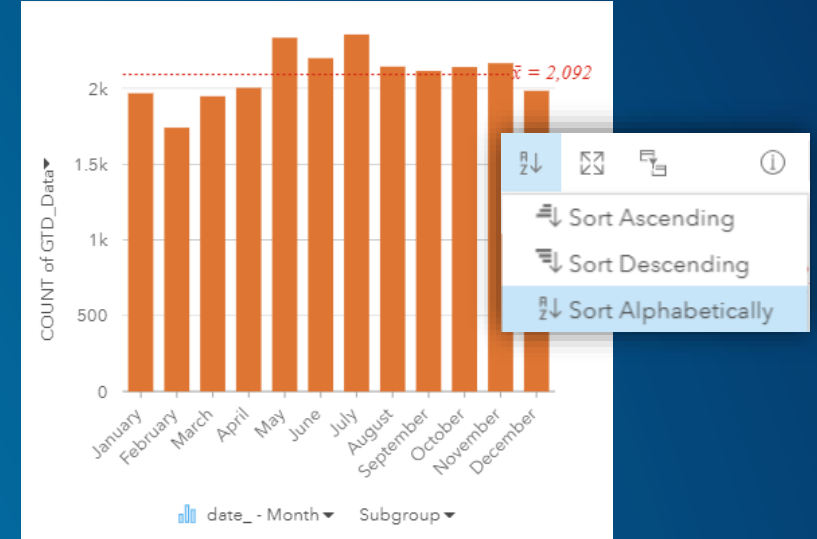
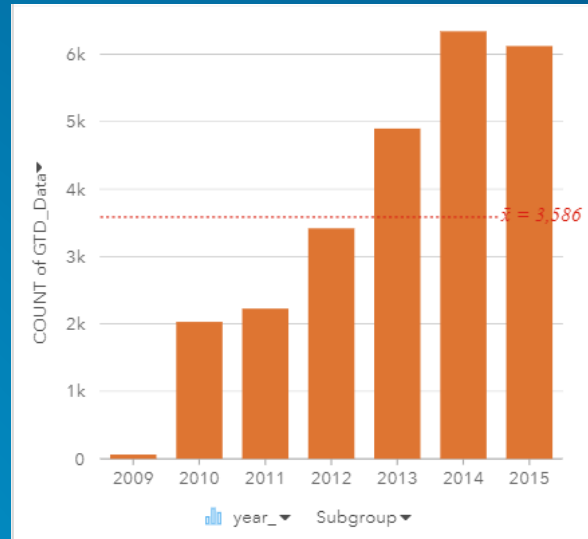
→ Bar Chart 1

→ Calculate Density 1



Working with dates

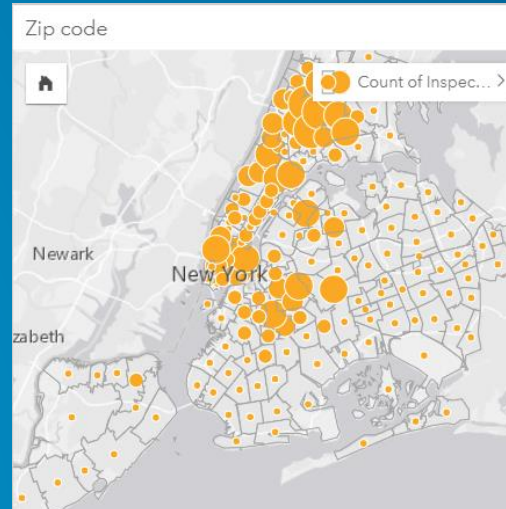
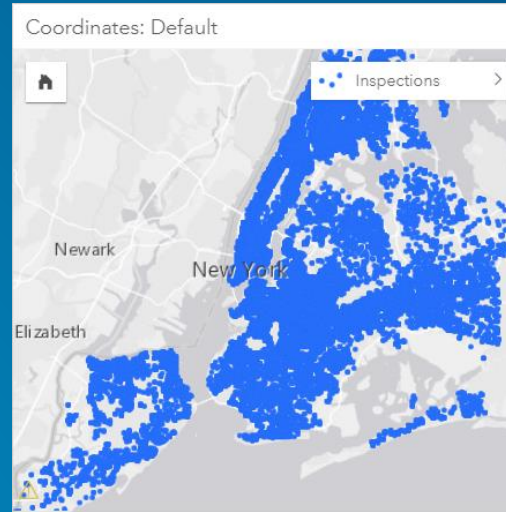
-  year_ - - - - ->
-  month_ - - - - ->
-  day_ - - - - ->
-  date_ - - - - ->
-  Year
-  Quarter
-  Month
-  Day of month
-  Day of week
-  Hour
-  Minute



Multiple spatial fields

Shape fields

- Coordinates
- USA_ZIP_Code
- INSPECTION_TYPE
- JOB_TICKET_OR_WORK_O...
- JOB_ID
- JOB_PROGRESS



Layer options

Style by

- inspectdate - Quarter
- inspectdate - Month
- inspectdate - Day of month
- inspectdate - Day of week
- inspectdate - Hour
- inspectdate - Minute
- Inspections

COUNT of Inspections



Create Relationships

INCIDENT_DATE - Year ↓↑	AIRPORT_ID ↓↑	COUNT of WILDLIFE STRIKES ↓↑
1990	CYYZ	4
	D09	1
	EDDF	1
	EDDN	1
	EDDT	2
	EGKK	1
	H20	1
	KABE	1
	KABI	1
	KABQ	1
	KABR	1

DATE - Year ↓↑	AIRPORT_ID ↓↑	TOTAL_OPERATIONS SUM ↓↑
1989	KABQ	56,569
	KADW	34,542
	KATL	189,901
		46,038
		63,299
		110,748
		5,122
		1,254
		1,311
		3,302
		6,838
		7,833

Create Relationships

My Data

- ✓ Strike by year and airport
- ✓ Total operations by air...
- ✓ AIRPORTS
- STRIKE_REPORTS
- OPERATIONS

Strike by year and ... X

- AIRPORT_ID
- INCIDENT_DATE - Year

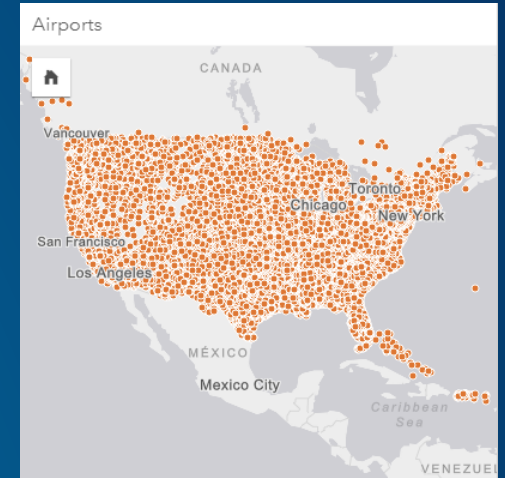
Total operations b... X

- AIRPORT_ID
- DATE - Year

AIRPORTS X

- AIRPORT_ID

Finish Cancel



Relationships

Create Relationships

My Data

- ✓ well_production
- ✓ well_attributes

well_production

well_attributes

API

Edit Relationship

Choose Relationship Type

Relationship type determines the way data is combined.

Intersect All Left Right

Choose Fields

Choose the fields you want to base the relationship on.

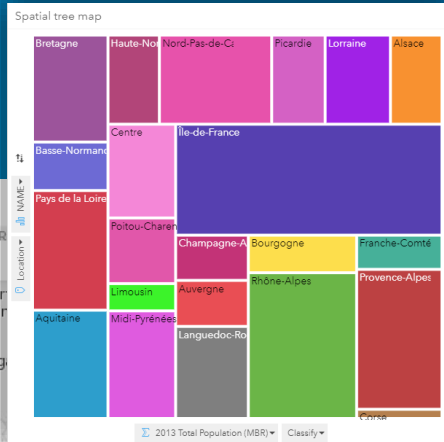
API — API

+

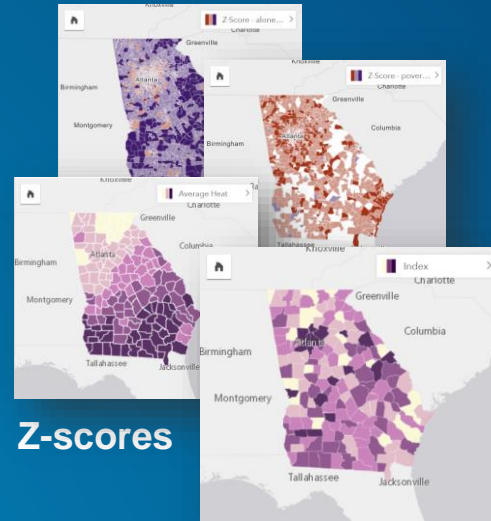
Cancel Finish

Working with Analysis

Work in Cards



Spatial tree map



Z-scores

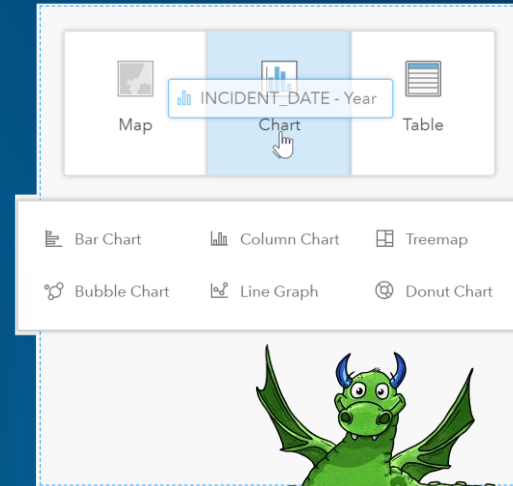
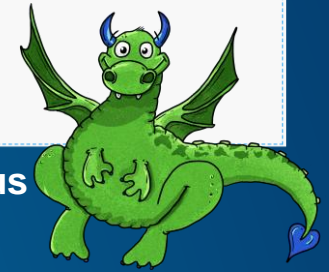
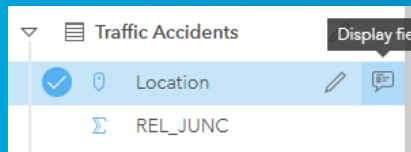


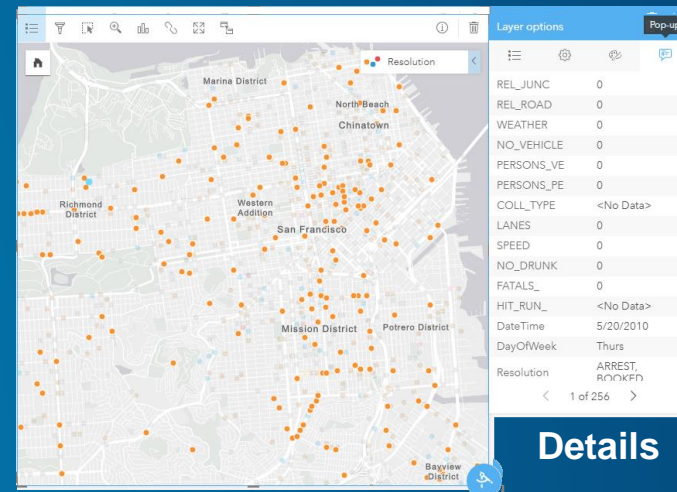
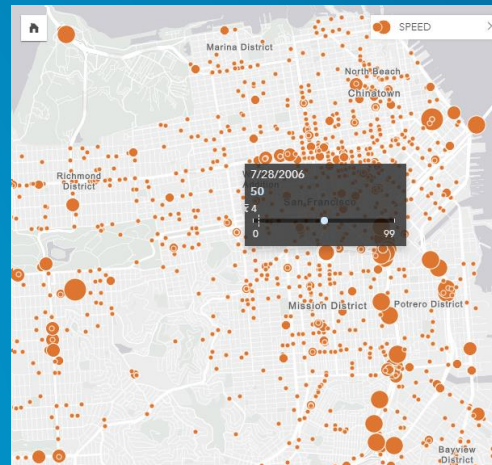
Chart menus



Add a second piece of information to the pop-up



Pop-ups

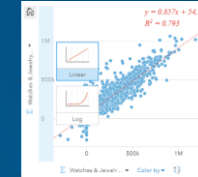
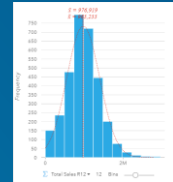
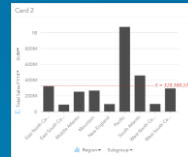
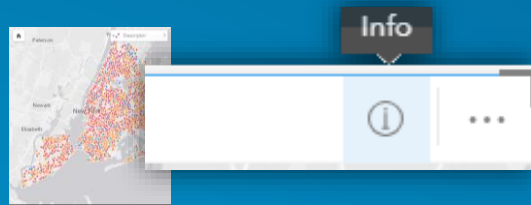


Details

Some important things to know



Statistics on cards



Layer options

Descriptor	Count
Condition Attracting Rodents	7,945
Mouse Sighting	4,994
Rat Sighting	19,437
Signs of Rodents	3,189

Card 2

Description

Summarize your analysis activity...

Statistics

Name	Value	Updated
Column Chart 1		12 second(s) ago
Count	9	
Mean	328,360,539	
Median	267,501,487	
Upper Quartile	322,850,870	
Lower Quartile	97,060,785	

Description

Summarize your analysis activity...

Statistics

Name	Value	Updated
Retail_Stores		49 second(s) ago
Count	3,156	
Mean	976,919	
Median	965,255	
Upper Quartile	1,226,544	
Lower Quartile	710,181	
Standard Deviation	424,187	
Skewness	0.37	

Card 3

Description

Summarize your analysis activity...

Statistics

Name	Value	Updated
Retail_Stores		5 minute(s) ago
Count	3156	
Mean Watches & Jewels	210,815	
Median Watches & Jewels	195,779	
Upper Quartile Watches & Jewels	234,780	
Lower Quartile Watches & Jewels	776,560	

Rodent complaints

Description

Summarize your analysis activity...

Statistics

Name	Count	Updated
Descriptor	35,565	28 minute(s) ago
Condition Attracting Rodents	7,945	
Mouse Sighting	4,994	
Rat Sighting	19,437	
Signs of Rodents	3,189	

Attribution

Esri, HERE, Garmin, NGA, USGS, NPS | Esri, HERE, NPS

Chart Statistics

- Mean
- Median
- Upper Quartile
- Lower Quartile
- Custom

Chart Statistics

- Mean
- Median
- Normal Distribution

Chart Statistics

- None
- Linear
- Exponential
- Polynomial 2



A window into the steps of analysis

Map Chart Table

- AIRPORTS
- STRIKE_REPORTS
- OPERATIONS

Add Data
OPERATIONS
+ Update

Aggregate

Aggregate

- WEB-REPORT-24829_c752...
- SUM total_operations
- Group by: year_date,airpor...

Add Data
STRIKE_REPORTS
+ Update

Aggregate

Aggregate

- STRIKE_REPORTS_43c89ab
- COUNT esri_oid
- Group by: year_incident_d...

Add Data
AIRPORTS
+ Update

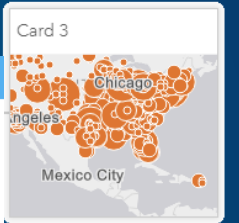
Join

Join

- WEB-REPORT-24829_1afc1...
- STRIKE_REPORTS_7d3e605
- AIRPORTS_e5156db
- Type: INNER
- Fields: airport_id, airport_id
- Type: INNER
- Fields: year_date, year_inci...
- Type: INNER
- Fields: airport_id, airport_id

Aggregate

- WEB-REPORT-24829_7f8f841
- SUM esri_oid_count
- Group by: shape



DATE - Year	AIRPORT_ID	TOTAL...
1989	KABQ	56,569
	KADW	34,542
	KATL	189,901
	KBDL	46,038
	KBNA	63,299
	KBOS	110,748
	KBWI	75,122
	KCLE	64,254
	KCLT	111,311
	KCVG	68,302
	KDAY	46,838
Total		1,616,307,833

INCIDENT...	AIRPORT_ID	COUNT of ...
1990	1G3	1
	3CK	1
	3MY	1
	6K5	1
	C62	1
	C66	1
	CYEG	1
	CYOW	1
	CYUL	1
	CYYC	2
	CYYZ	4
Total		178,665



Regression Analysis

Create Regression Model

1 Choose a layer
Leaks

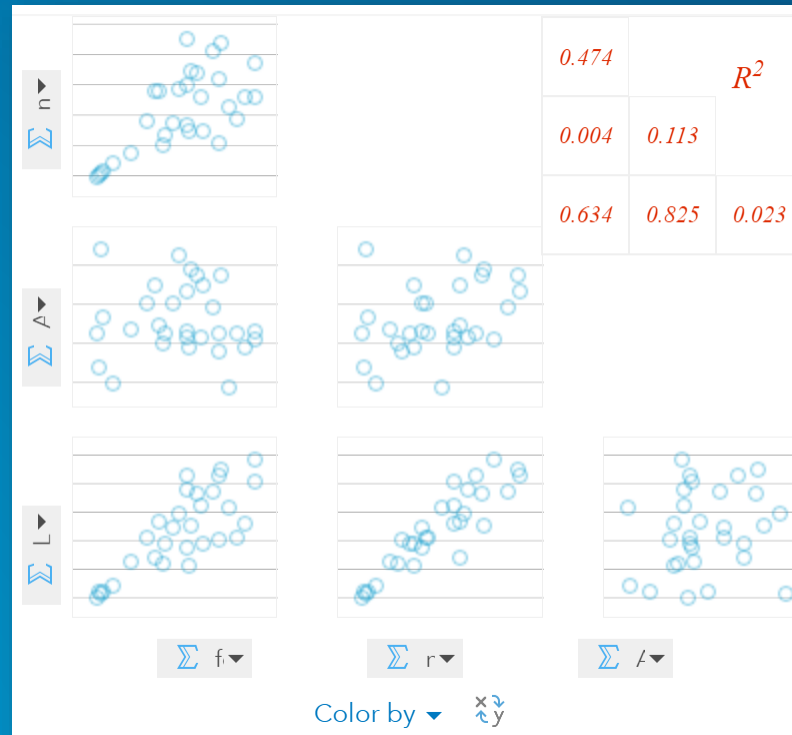
2 Choose a dependent variable
Σ Leaks

3 Choose explanatory variables
 Σ Avg Diameter
 Σ Avg Roughness
 Σ Sum of lengthmiles

Visualize

Run

Regression model statistics
Y = 114 + 0.000823feet_pipe + ...
R²: 0.88529513
Adjusted R²: 0.87205995
Durbin-Watson Test: 1.35857756



Function in the Data pane

fx Regression Model 1

Regression model statistics

Y = 114 + 0.000823feet_pipe + ...

R²: 0.88529513

Adjusted R²: 0.87205995

Durbin-Watson Test: 1.35857756



Road Ahead

New Home Screen

Insights ?

Home

ANALYSIS

- Workbooks
- Models

DATA

- Datasets
- Connections

PRESENTATION

- Pages
- Themes

Welcome Tester!

RECENT WORKBOOKS

- JANUARY 25, 2019
JoseWorkbook
- JANUARY 25, 2019
Darnell
- JANUARY 25, 2019
Automated Tests
- JANUARY 25, 2019
48399dfa

PULSE

Last 15 days

Sharing summary

Total: 444

- Private
- Shared with groups
- Shared with the organization
- Shared with everyone

FAVORITES

- Untitled Workbook
- Untitled Workbook
- ek saas Page 1

Support for Open Data Sciences

- **Take advantage of existing open data science infrastructure**
 - Use Python or R Kernels and any library you have access to
 - Use Insights datasets and attributes as inputs to Python Scripts
 - Use results from your Python or R outputs in Insights
 - Data
 - Graphs
- **Save work done within Insights as .py, .r or Notebook**
- **Use “Magic Command(s)” to simplify working between Insights and your kernels**



Python & R in Insights

The screenshot shows the Microsoft Insights dashboard interface. At the top, there's a navigation bar with 'Insights' and a '+ ADD' button. Below it, a 'Page 1' tab is active, showing a 'Card 1' with a map of Canada and a 'Data table' button. A 'Jupyter kernel gateway' dialog box is open, prompting the user to 'Select kernel' with a callout that says 'Click here to view and select a kernel.' Below this, another 'Jupyter kernel gateway' dialog is shown with 'Python 3' selected. The main workspace displays a Python 3 kernel with the following code:

```
In [0]: def plot_with_std(x, y, stds, ax, title, y_label):  
        ax.fill_between(x, y - stds, y + stds, alpha=0.2)  
        plot(x, y, ax, title, y_label)  
  
fig, (ax1, ax2) = plt.subplots(ncols=2)  
title = 'Increase in mean and std Fortune 500 company %s from 1955 to 2005'  
stds1 = group_by_year.std().profit.as_matrix()  
stds2 = group_by_year.std().revenue.as_matrix()  
plot_with_std(x, y1.as_matrix(), stds1, ax1, title % 'profits', 'Profit  
(millions)')  
plot_with_std(x, y2.as_matrix(), stds2, ax2, title % 'revenues', 'Revenue  
(millions)')  
fig.set_size_inches(14, 4)  
fig.tight_layout()
```

The output shows a 3D surface plot with a color gradient from blue to red, representing the data over time. The plot is titled 'Increase in mean and std Fortune 500 company %s from 1955 to 2005'. The x-axis represents years, and the y-axis represents profit and revenue in millions. The z-axis represents the standard deviation. The plot shows a clear upward trend in both profit and revenue over time, with the standard deviation also increasing. The plot is titled 'Increase in mean and std Fortune 500 company %s from 1955 to 2005'. The x-axis represents years, and the y-axis represents profit and revenue in millions. The z-axis represents the standard deviation. The plot shows a clear upward trend in both profit and revenue over time, with the standard deviation also increasing.

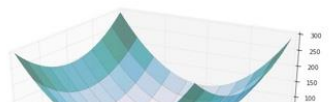
In [1]: |

Cells 2; Lines: 15

```
Python  
In [0]: def plot_with_std(x, y, stds, ax, title, y_label):  
        ax.fill_between(x, y - stds, y + stds, alpha=0.2)  
        plot(x, y, ax, title, y_label)  
  
fig, (ax1, ax2) = plt.subplots(ncols=2)  
title = 'Increase in mean and std Fortune 500 company %s from 1955 to 2005'  
stds1 = group_by_year.std().profit.as_matrix()  
stds2 = group_by_year.std().revenue.as_matrix()  
plot_with_std(x, y1.as_matrix(), stds1, ax1, title % 'profits', 'Profit  
(millions)')  
plot_with_std(x, y2.as_matrix(), stds2, ax2, title % 'revenues', 'Revenue  
(millions)')  
fig.set_size_inches(14, 4)  
fig.tight_layout()  
Data = { Hospitals X, Hospitals X, Hospitals X }
```

Cells 1; Lines: 14

```
Python  
In [0]: ax.fill_between(x, y - stds, y + stds, alpha=0.2)  
        plot(x, y, ax, title, y_label)  
  
fig, (ax1, ax2) = plt.subplots(ncols=2)  
title = 'Increase in mean and std Fortune 500 company %s from 1955 to 2005'  
stds1 = group_by_year.std().profit.as_matrix()  
stds2 = group_by_year.std().revenue.as_matrix()  
plot_with_std(x, y1.as_matrix(), stds1, ax1, title % 'profits', 'Profit  
(millions)')  
plot_with_std(x, y2.as_matrix(), stds2, ax2, title % 'revenues', 'Revenue  
(millions)')  
fig.set_size_inches(14, 4)  
fig.tight_layout()
```

Out [0]: 

Cells 2; Lines: 15

2019 Roadmap



More analysis & visualization methods



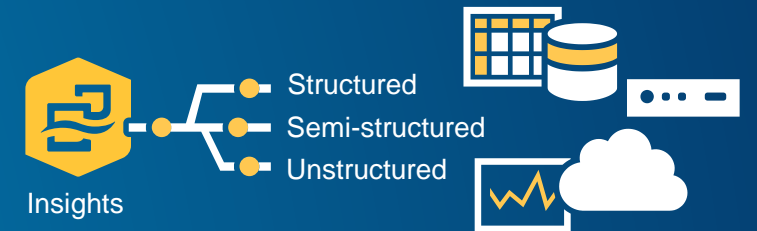
Desktop
Mac and Windows PC



Big data analytics
& visualizations



Python & R Integration



More data connectors
& connector extensibility



esri

THE
SCIENCE
OF
WHERE