ArcGIS Online: Enrich Your Maps with Arcade

Paul Barker @barker_pc

Lisa Berry @lisaberry_gis

Anne Fitz

esri THE SCIENCE OF WHERE

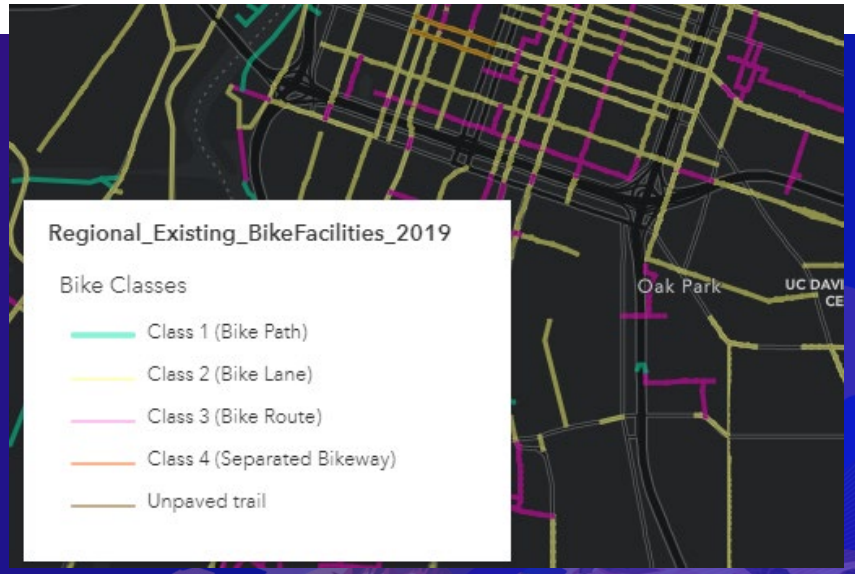
Agenda

- What is Arcade?
- Why use Arcade?
- Basics
- Where to find Arcade
- Beyond the Basics
- Advanced functionality
- Debugging
- What's Next
- Resources

Expression

Test

```
var bikeClass = $feature["BIKE_CLASS"]
When(bikeClass == 0, "Unpaved trail",
    bikeClass == 1, "Class 1 (Bike Path)",
    bikeClass == 2, "Class 2 (Bike Lane)",
    bikeClass == 3, "Class 3 (Bike Route)",
    bikeClass == 4, "Class 4 (Separated Bikeway)",
    null)
```



What is Arcade?

- Lightweight expression language for working with your ArcGIS data
- Works across the ArcGIS platform
  - ArcGIS Pro
  - ArcGIS Online
  - Runtime SDKs
  - JavaScript API

Input values → Arcade Expression → Resulting value

What is Arcade?

Portable

- expressions work across the platform

Secure

- expressions do not compromise security

Lightweight

- scripts and expressions execute quickly

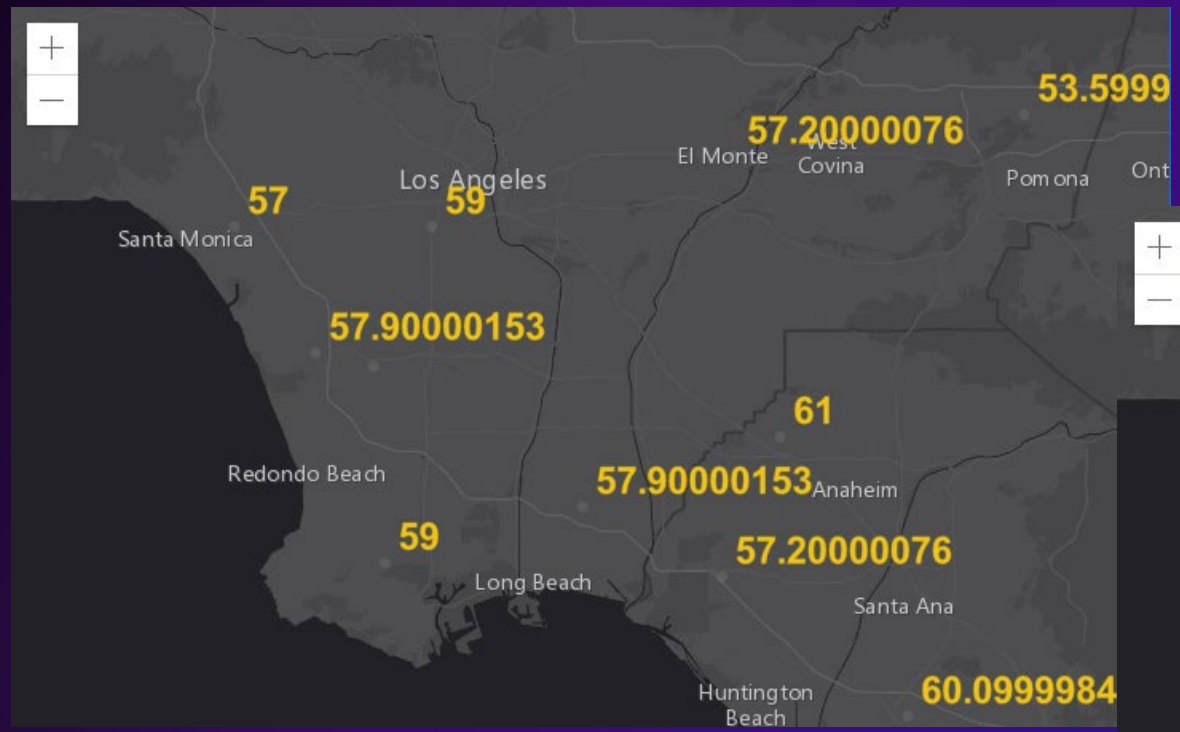
Geospatial

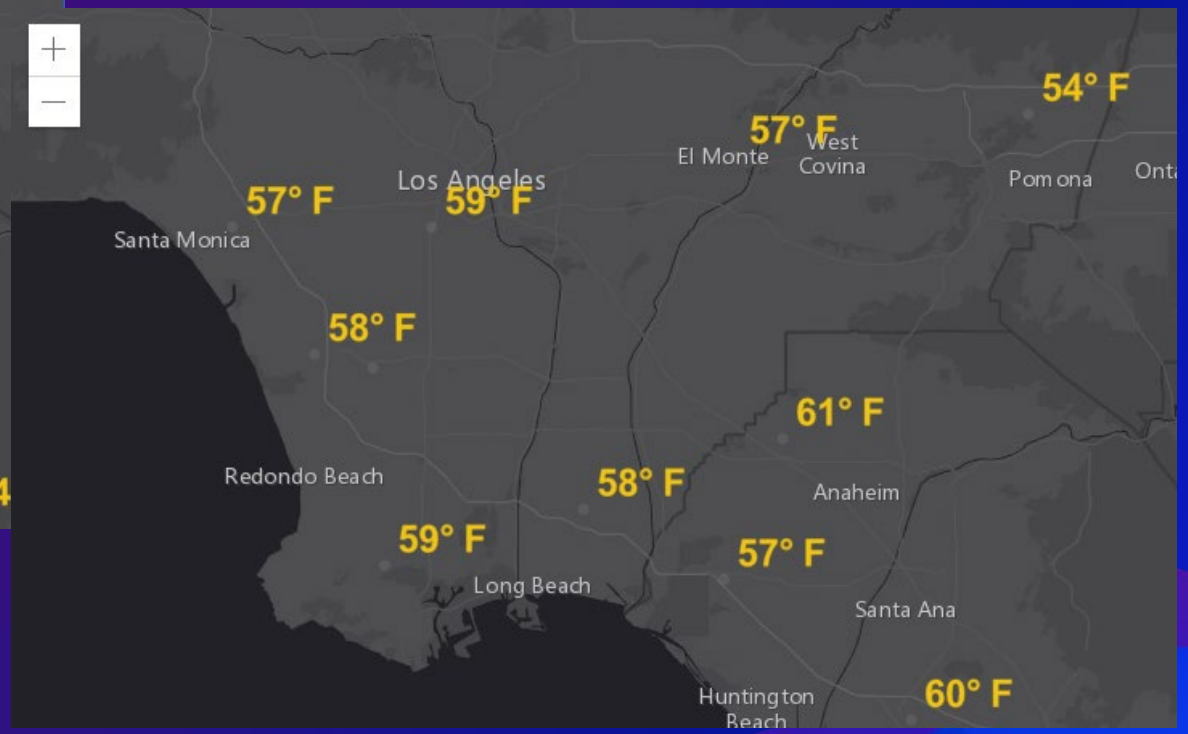
- treat geospatial data as first class members

Why use Arcade?

- Easy to get started
- On the fly calculations
  - Map will stay up to date even if your data changes!
- Expressions can be used in downstream applications
- Arcade can be used to…
  - Add a field
  - Update the data type
  - Perform calculations
  - … and much more!

Why use Arcade?





Profiles

Field Calculate

Labeling

Popup

Visualization

Constraint

Built in functions

Globals | Functions | Constants | Existing

Filter by Name

- Abs
- Acos
- Angle
- Area
- AreaGeodetic
- Array
- Asin
- Atan

Expression

```
1 Angle(pointA,pointB)
```

Globals | Functions | Constants | Existing

← Return to function list

Angle (pointA , pointB) returns { Number }

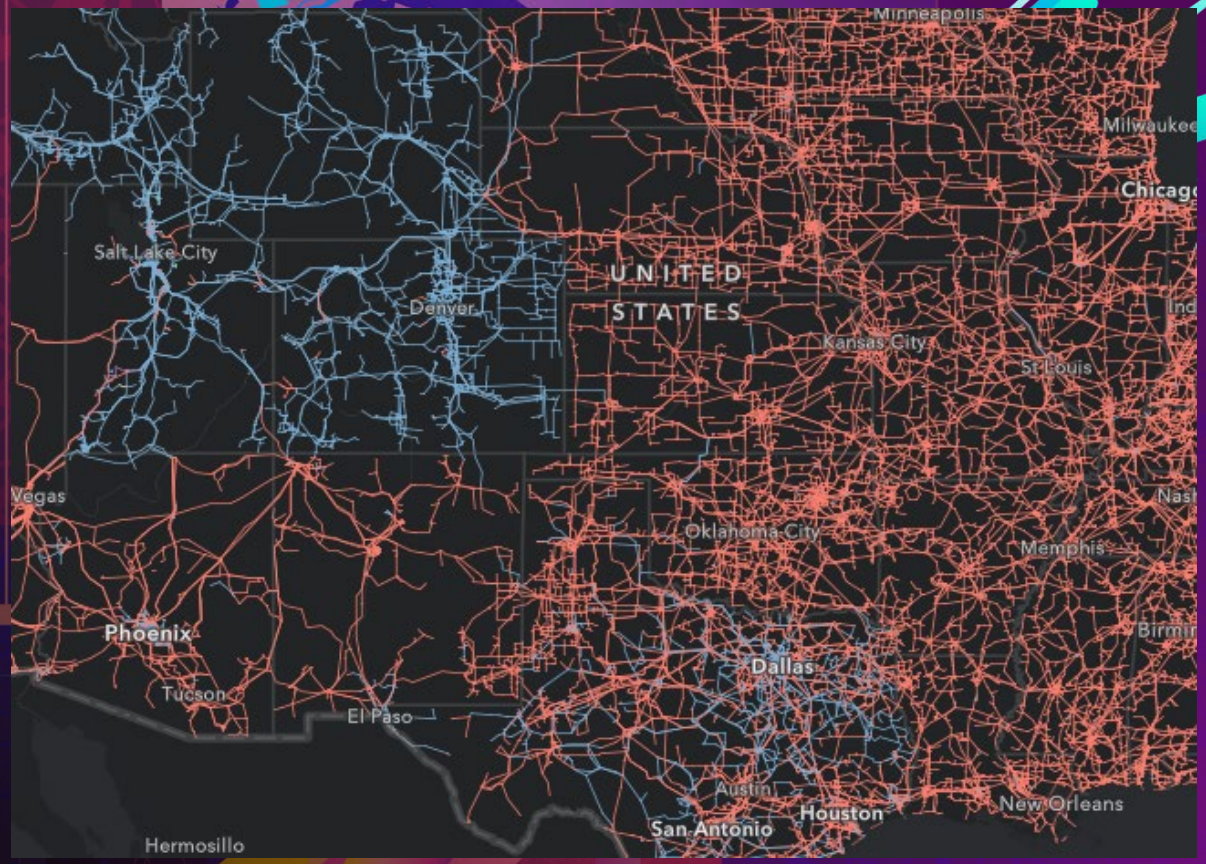
Returns the arithmetic angle of a line between two points in degrees (0 - 360). The angle is measured in a counter-clockwise direction relative to east. For example, an angle of 90 degrees points due north.

Only the x-y plane is considered for the measurement. Any z-coordinates are ignored. Point features can be used instead of any or both Point geometries. *If the points are identical, then an angle of 0 degrees is returned.*

See bearing.

Name	Type	Description
`pointA`	Point / Feature	The first point used to calculate the angle.
`pointB`	Point / Feature	The second point used to calculate the angle.

View the complete function reference at
https://developers.arcgis.com/arcade/function-reference/

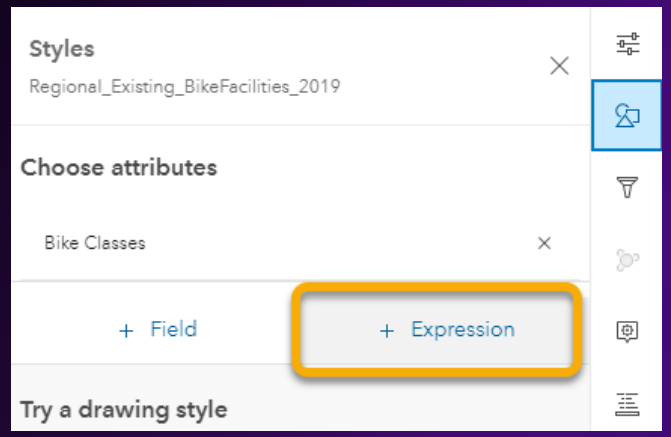


Get Started with Arcade

Anne Fitz

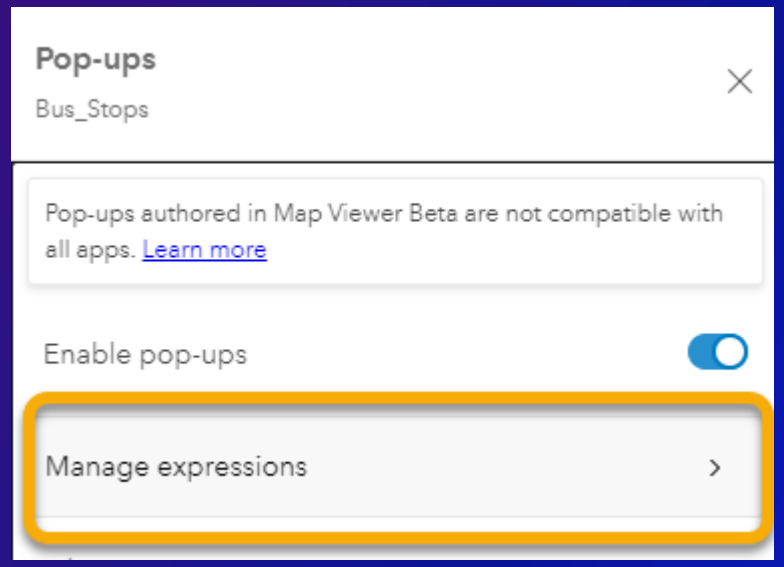
Where to find it in Map Viewer

Symbology

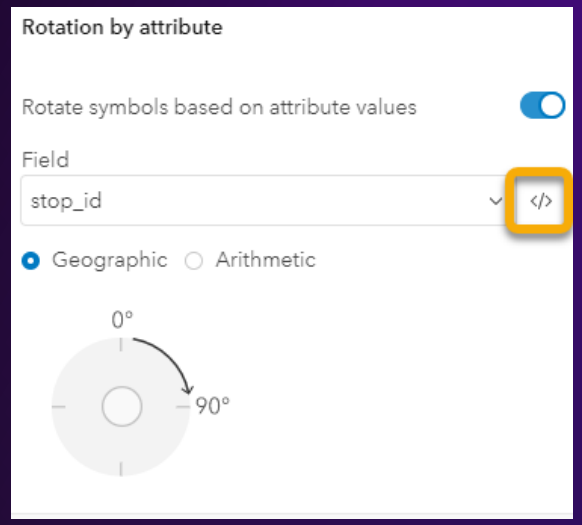


Transparency

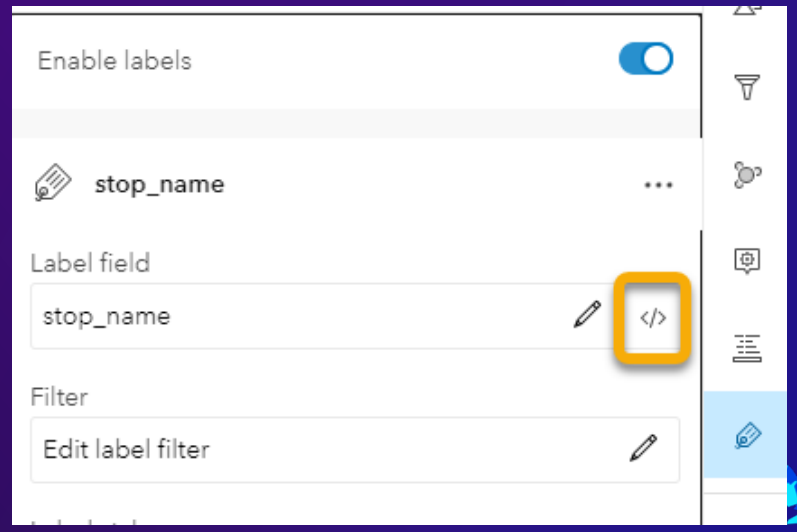
Pop-up Configuration



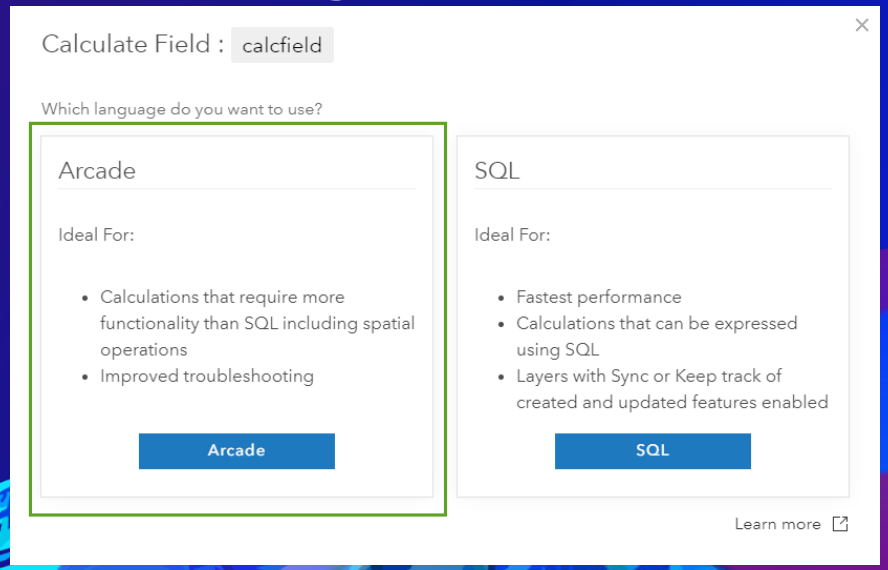
Rotation



Labels



Calculating Field Values



Beyond the Basics

- Variables

```
var totalPopulation = $feature["TOTALPOP"]
var youthPopulation = $feature["YOUTH"]
var percentYouth = (youthPopulation/totalPopulation)*100

return percentYouth
```

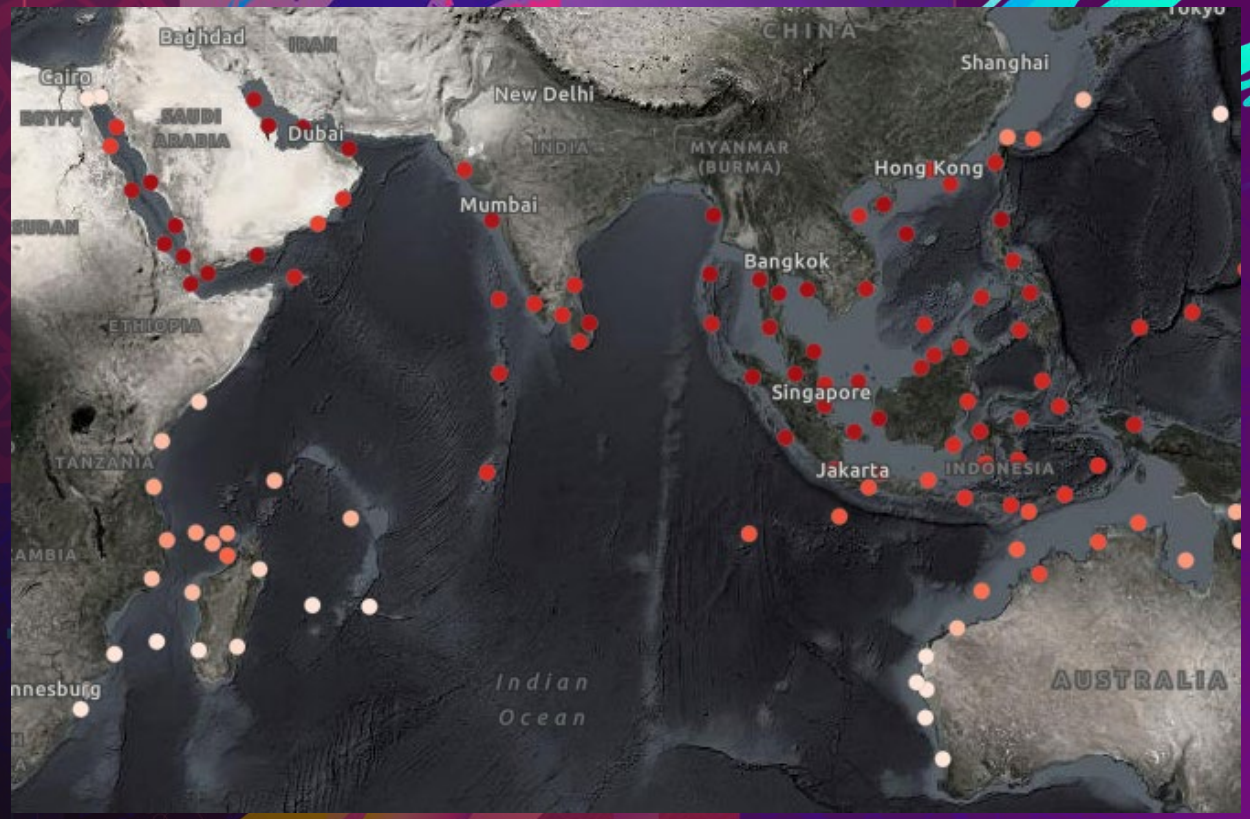
- Return statements

- Logical statements
  - If/else
  - Iif()
  - When()

```
if(x > 2){
    return "High"
}
else{
    return "Low"
}
```

```
When(x > 2 && x < 10, "Medium",
    x <= 2, "Low",
    "High")
```

```
IIf(x > 2, "High", "Low")
```



Arcade Basics

Lisa Berry

Advanced functionality

- FeatureSets
- Build your own functions
- Objects
- GroupBy
- Data functions

```
var treeBuff = Buffer($feature, 100, 'foot')
var treesWithin = Intersects(treebuff, $layer)
return Round(Average(treesWithin, "height"),2)
```

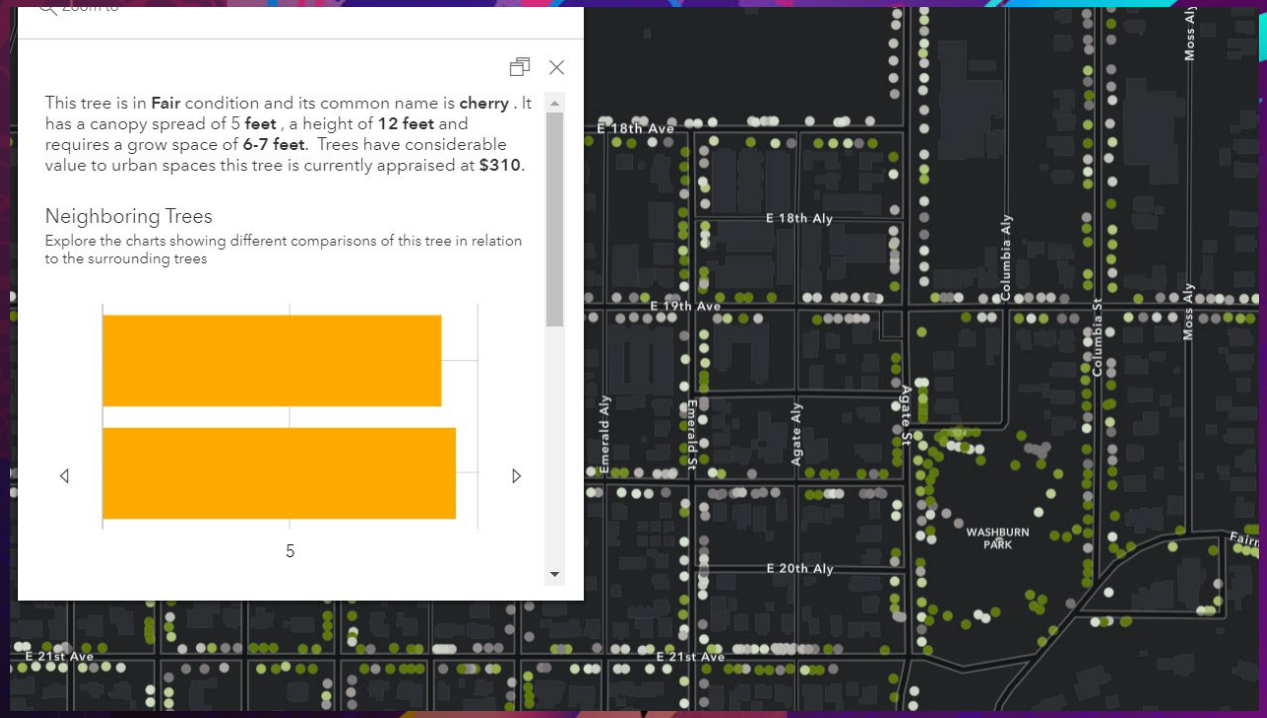
```
var intersectPrecinct = Intersects(FeatureSetByName($datastor
var crimeList = groupBy(intersectPrecinct, 'ucrdesc',
                {name:'count', expression:'ucrdesc' , statist

var topFeature = First(OrderBy(crimeList, 'count DSC'))
return topFeature.ucrdesc + "(" + topFeature.count + ")"
```

```
var intersectPrecinct = Intersects(FeatureSetByName($datasto
var distinctList = Distinct(intersectPrecinct,'ucrdesc')
var list = ""

for (var l in distinctList) {

    list += l.ucrdesc + TextFormatting.NewLine

}
return list
```

Setting yourself up for success

- Plan things out ahead of time. Think about the logic your expression will use
- Take advantage of the test button to try different values for your conditional logic
- For long expressions factor out logic into functions
- Log information out to the console to help troubleshoot

- If you’re expression is slow keep the following in mind
  - FeatureSets can be expensive queries so only request what you really need
  - Combine multiple expressions into one when possible



FeatureSet Demo

Paul Barker

What’s Next

- New Arcade editor
- More flexible options when formatting arcade expressions results for different locales
- Access to EXIF data for attachments
- Length3D()
- More flexibility in pop-ups

Untitled Expression

```
var intersectNeigh = Intersects(FeatureSetByName($map,"Collisions"), $feature)
var accidentList = groupBy(intersectNeigh, 'TOTAL_COLLISIONS * 0',
    [{name:'totCount', expression:'TOTAL_COLLISIONS' , statistic:'SUM'},
    {name:'cycCount', expression:'CYCLIST_COLLISIONS' , statistic:'SUM'},
    {name:'pedCount', expression:'PEDESTRIAN_COLLISIONS' , statistic:'SUM'}])
var stats = First(accidentList)

return "In " + $feature.Name + " there have been " + stats.totCount +
      " accidents of those accidents " + stats.cycCount + " have been cyclist related" +
      "and " + stats.pedCount + " have been pedestrian related"
```

Resources: https://esriurl.com/UC2021_Arcade

- **Help doc: https://developers.arcgis.com/arcade/**
- **Learn Path: https://learn.arcgis.com/en/paths/try-arcade/**
- **Blogs: https://www.esri.com/arcgis-blog/?s=#arcade**
- **Your Arcade Questions Answered: https://www.esri.com/arcgis-blog/products/arcgis-online/data-management/your-arcade-questions-answered/**
- **Story Map (What is Arcade and why use it?): https://storymaps.arcgis.com/stories/2240af05fbfc45ddbf421e7d50b05333**
- **GitHub Examples: https://github.com/esri/arcade-expressions**

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