Arcade Across the Platform

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Esri Southeast User Conference

ArcGIS Arcade: An Introduction

- ArcGIS Arcade
  - What is ArcGIS Arcade?
  - Arcade profiles, expressions, and workflow
  - The Arcade expression language
- How Arcade is used
  - Maps
  - Apps
  - APIs

ArcGIS Arcade is…

"…a portable, lightweight, and secure expression language written for use in ArcGIS."

Portable --- Write, share, and execute expressions across ArcGIS

Lightweight --- Runs in ArcGIS with minimal impact

Secure --- No executable code

Expression language --- Write statements that ArcGIS can execute

For use in ArcGIS --- Developed by Esri for use in ArcGIS

Arcade profiles

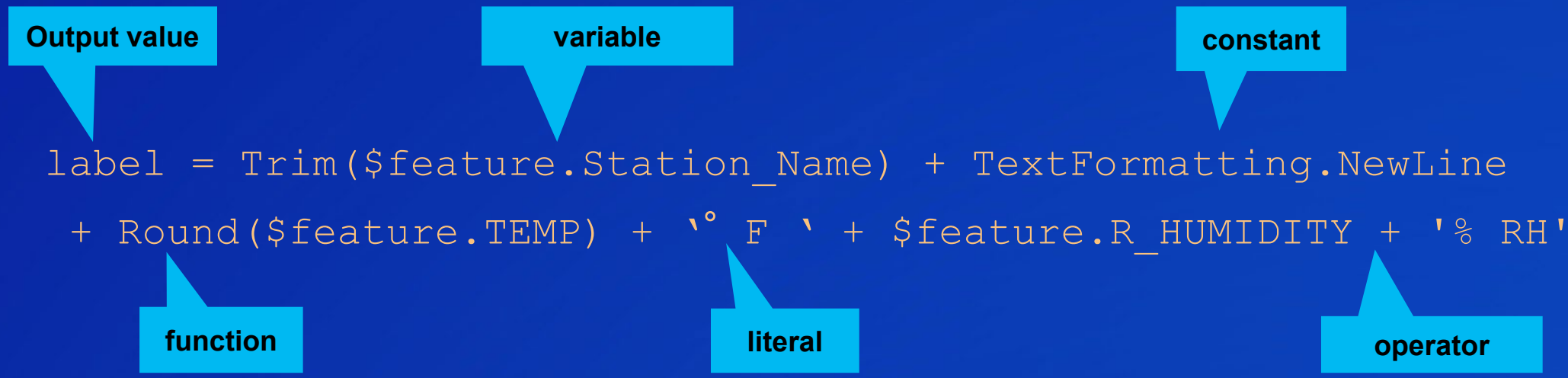
Profile --- context in which expression is evaluated and understood

- Alias
- Attribute Rules (3)
- Constraint
- Dashboard (2)
- Dictionary Renderer
- Feature Z
- Field Calculation
- Field Mapping
- Form Calculation
- GeoAnalytics
- Geotrigger Notification
- Labeling
- Layout
- Location Update Constraint
- Measure Visualization
- Popups (2)
- Tasks
- Velocity
- Visualization

Global Variables --- special variables usable in expressions

`$datastore` `$feature` `$layer` `$map` `$value` `$view.scale`

Arcade expressions



Arcade workflow

Profile

Labeling

Popup

Visualization

Global Variables

`$feature`

`$feature` `$layer`
`$map` `$datastore`

`$feature` `$view.scale`

Arcade Language

Structure & Logic

- Variables
- Data types
- If statement
- For loops
- Operators
- User-defined functions

Functions

- Data
- Date
- Geometry
- Logical
- Mathematical
- Text

Expression

Returns

Label string

Popup text

Rendering value

Arcade language basics

```
/* Multi-line label
 * Name, Temp, Wind direction,
 * Relative humidity
 */
var DEG = $feature.WIND_DIRECT;

var SPEED = $feature.WIND_SPEED;

// Calc wind octant
var DIR = When( SPEED == 0, null,
  (DEG < 22.5 && DEG >= 0) || DEG > 337.5, 'N',
  DEG >= 22.5 && DEG < 67.5, 'NE',
  DEG >= 67.5 && DEG < 112.5, 'E',
  DEG >= 112.5 && DEG < 157.5, 'SE',
  DEG >= 157.5 && DEG < 202.5, 'S',
  DEG >= 202.5 && DEG < 247.5, 'SW',
  DEG >= 247.5 && DEG < 292.5, 'W',
  DEG >= 292.5 && DEG < 337.5, 'NW', null );

var WIND = SPEED + ' mph ' + DIR;

var TEMP = Round($feature.TEMP) + '° F';

var RH = $feature.R_HUMIDITY + '% RH';

var NAME = $feature.STATION_NAME;

var labels = [ NAME, TEMP, WIND, RH ];

return Concatenate(labels, TextFormatting.NewLine);
```

Case insensitive

```
var labels = [ Name, Temp, Wind, RH ];
```

Comments

```
// Calc wind octant
/* Multi-line label
Name, Temp, Win dir, Rel hum
*/
```

Multi-line statements

```
var DIR = When( SPEED == 0, null, …
```

Mulitple statement separated by semicolons

Terminate statement with semicolon

```
var DEG = $feature.WIND_DIRECT;
var SPEED = $feature.WIND_SPEED;
```

Arcade language basics

```
/* Multi-line label
 * Name, Temp, Wind direction,
 * Relative humidity
 */
var DEG = $feature.WIND_DIRECT;

var SPEED = $feature.WIND_SPEED;

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var WIND = SPEED + ' mph ' + DIR;

var TEMP = Round($feature.TEMP) + '° F';

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var NAME = $feature.STATION_NAME;

var labels = [ NAME, TEMP, WIND, RH ];

return Concatenate(labels, TextFormatting.NewLine);
```

Variables declared with var

```
var DEG = $feature.WIND_DIRECT;
```

Access feature attributes using global variables

```
var RH = $feature.R_HUMIDITY + '% RH'
```

Access joined data

```
var percentageStatePop = Round(( $feature.POP21 /
$feature.[STATE.POP21] ) * 100, 2);
```

Access features in a layer

```
var totalValue = Sum( $layer, 'Market Value' );
```

Return results with `return`

```
return Concatenate( labels, TextFormatting.NewLine );
```

Arcade language basics

Data types

Array	`var label = [NAME,TEMP,WIND,RH];`
Boolean	`var RAINING = true;`
Date	`var today = Date(2021,7,12);`
Dictionary	`var WIND = Dictionary("Speed",10, "DIRECTION","southwest");`
Number	`var TEMP = 65;`
Text	`var NAME = "Mt. Rainier"`

ArcGIS specific data types

- Attachment
- Feature
- FeatureSet
- FeatureSetCollection
- Geometry
- Portal

Arcade language basics

Operators

- Mathematical --- `+` `-` `*` `/`
- Increment --- `i++` `j--`
- Comparison --- `==` `!=` `>` `<`
- Logical --- `&&` `||`

Built-in functions for data, dates, geometry, logical, mathematical, text, and tracking

`Sort()`	`Now()`	`Intersects()`
`IsEmpty()`	`Mean()`	`Trim()`
`TrackCurrentSpeed`		

Arcade language basics

Conditional statements

```
if ($feature.WIND_SPEED > 1 ){
  WIND = ROUND( $feature.WIND_SPEED * 0.62137 ) + " mph";
} else {
  WIND = "negligible"
}
```

- IIF()
- When()

Loop statements

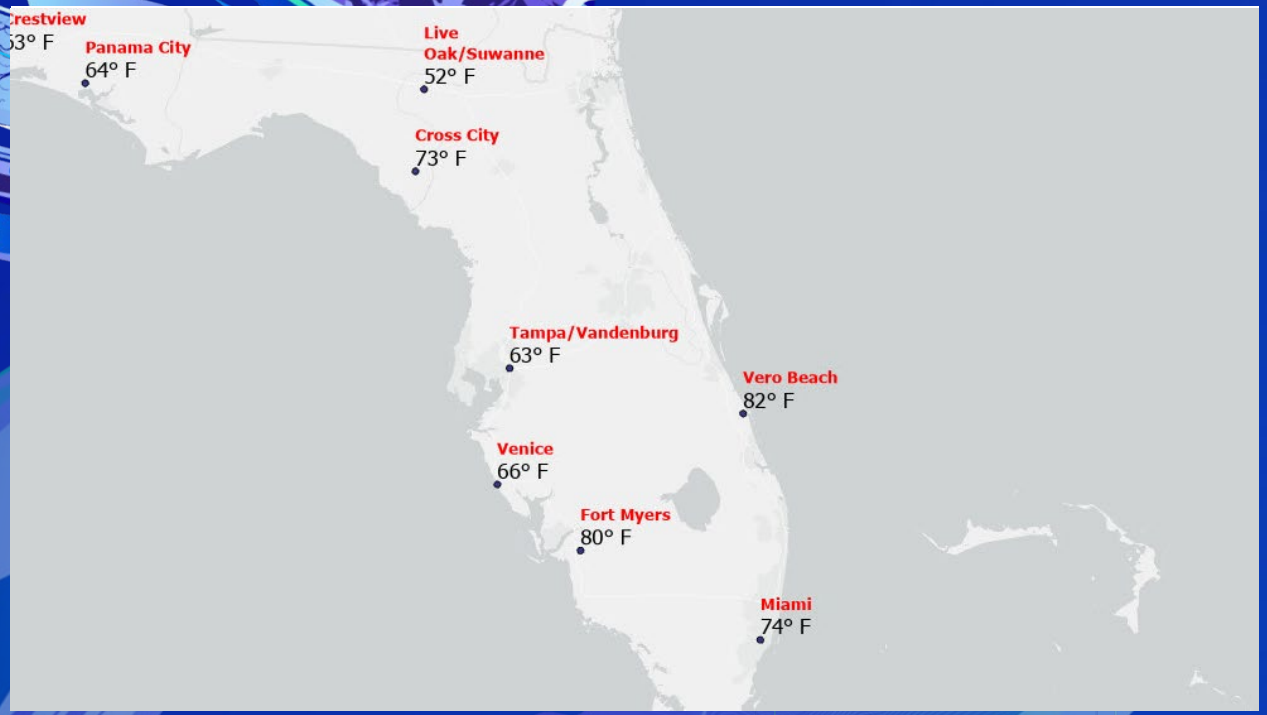
```
For ( var i = 0; i < MaxVal; i++ ){
  /* Code block */
};
```

- Iterate through arrays, dictionaries, and FeatureSets

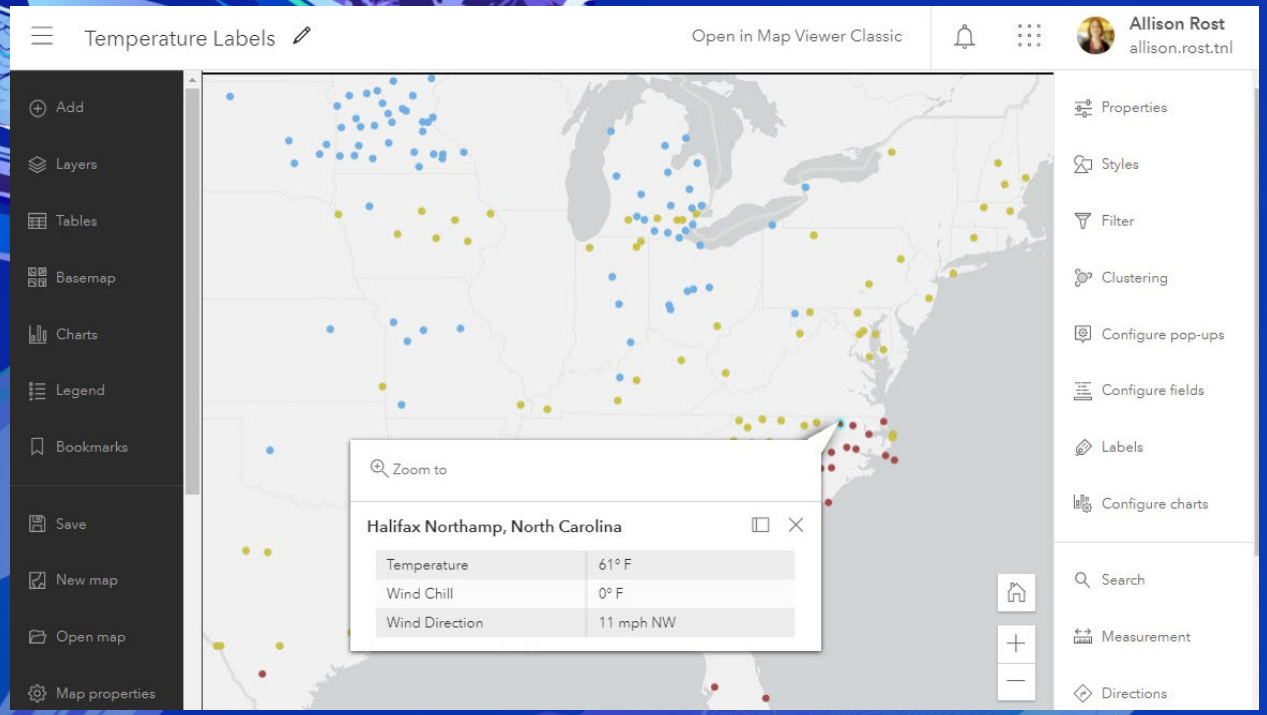
User-defined functions

```
Function calcWindSpeed( param1, param2 ){
  /* Code block */
};
```

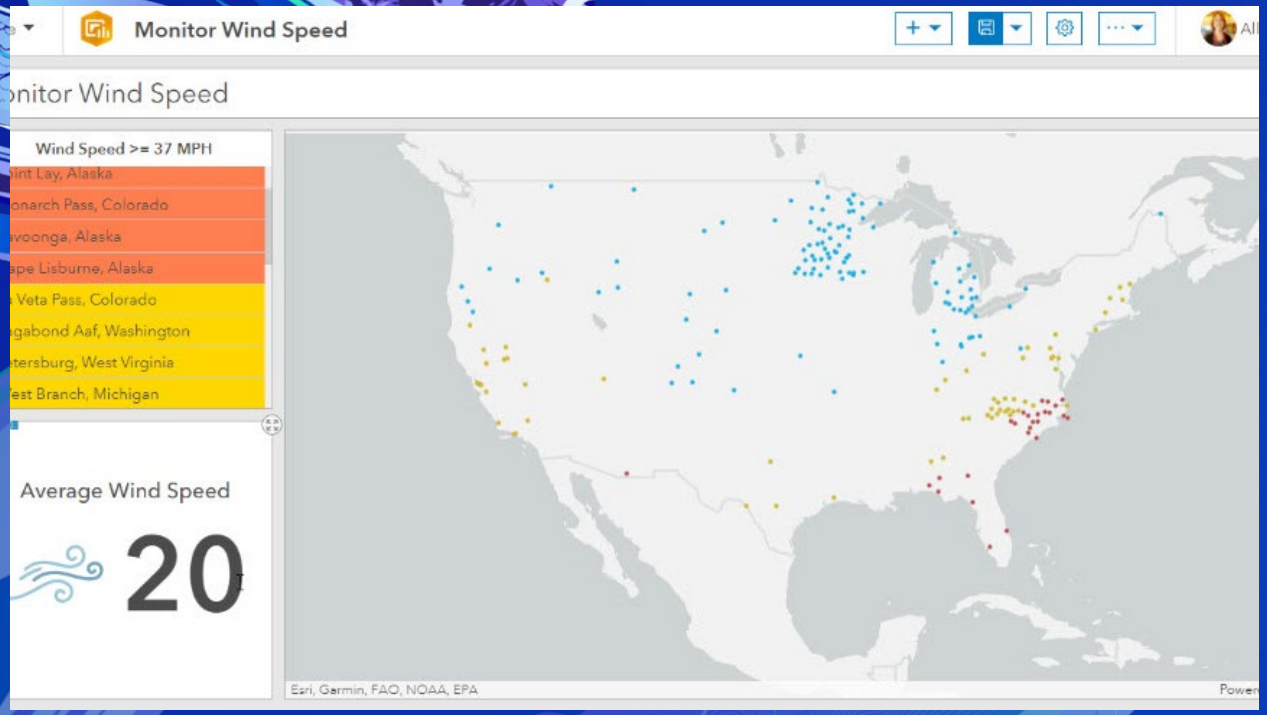
Demos



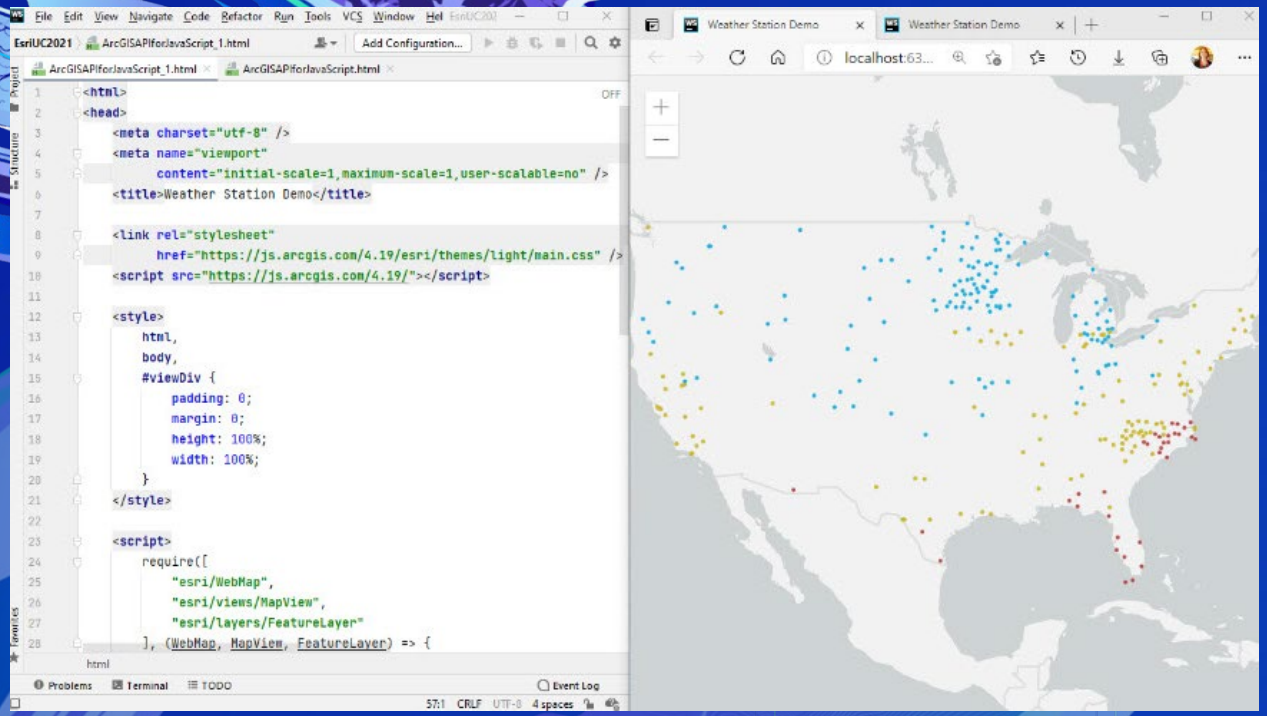
Using Arcade in ArcGIS Pro



Using Arcade in ArcGIS Online



Using Arcade in ArcGIS Dashboards



Using Arcade in a JavaScript application

Getting started with ArcGIS Arcade

ArcGIS Arcade --- developers.arcgis.com/arcade/

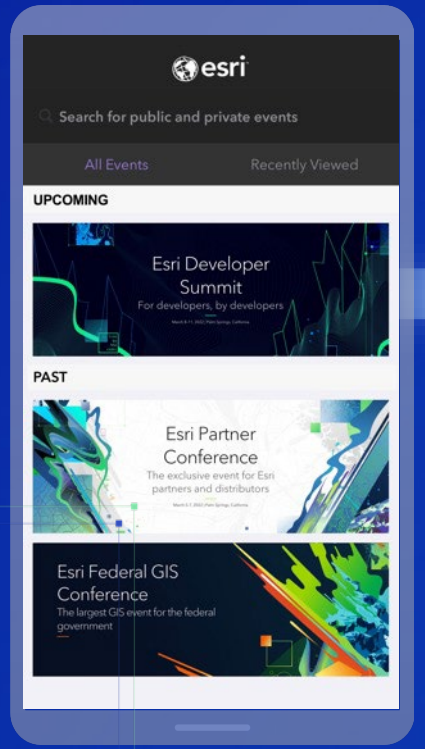
Esri Academy --- ArcGIS Arcade Fundamentals learning plan

Learn ArcGIS --- Try ArcGIS Arcade learning path

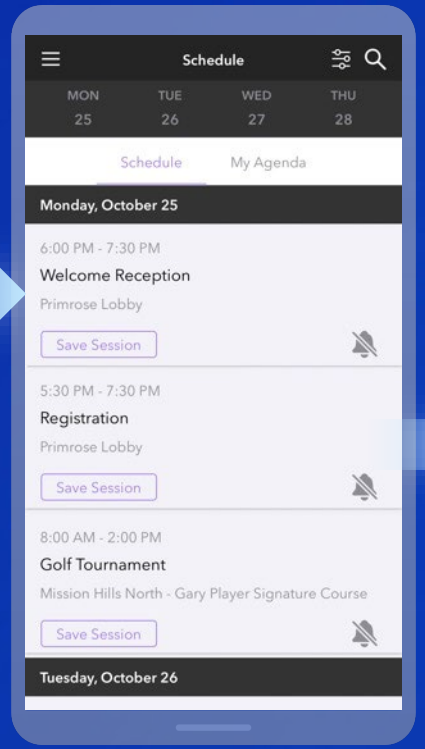
ArcGIS Blog --- search for ‘arcade’

Please Share Your Feedback in the App

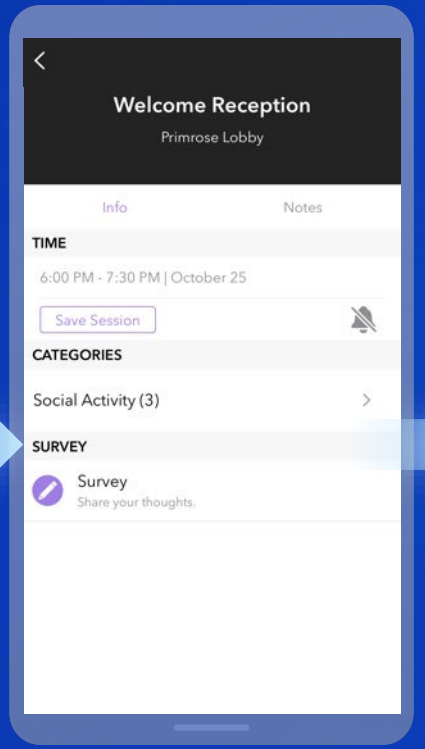
Download the Esri Events app and find your event



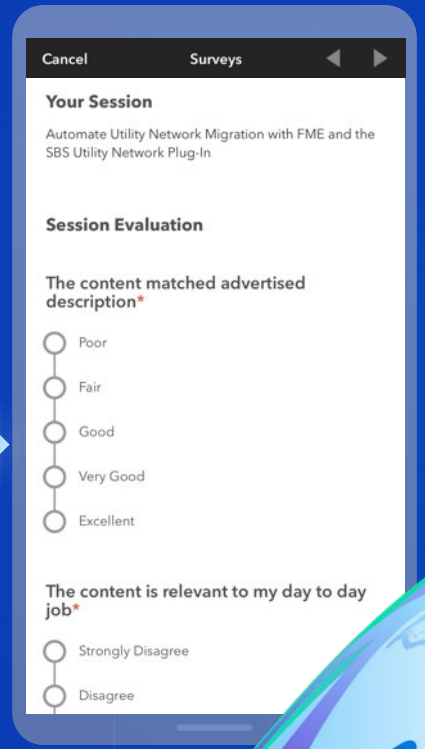
Select the session you attended



Scroll down to “Survey”



Log in to access the survey



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