

# Intro to Tableau's **Developer Tools**

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Ambassador

BI Analyst at Cosuno



**DATADEV**

 **tableau**

# By the end of this session you will...

... **understand** the Developer Platform APIs/tools and their use cases

... **know** when to use what

... **learn** where to find resources



# Tableau Developer Tools

## Automation / Integration

Automate tedious tasks, create custom workflows and manage Tableau content

## Extensibility

Give dashboards new capabilities, and integrate them with other applications

## Advanced Analytics

Integrate Tableau with advanced models in R, Python, and Matlab

## Embedding

Embed Tableau content into other applications

## Data Connectivity

Get any data into Tableau via custom connector or extract

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Connector SDK

Hyper API

Web Data Connector

	<b>Web Data Connector</b>	<b>HYPHER API</b>	<b>Connector SDK</b>
<b>Connect to</b>	Web-based data only (e.g. REST APIs, HTML)	Any data source/API	Any Database using an ODBC or JDBC driver

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Analytics Extensions API

R

Matlab

Python

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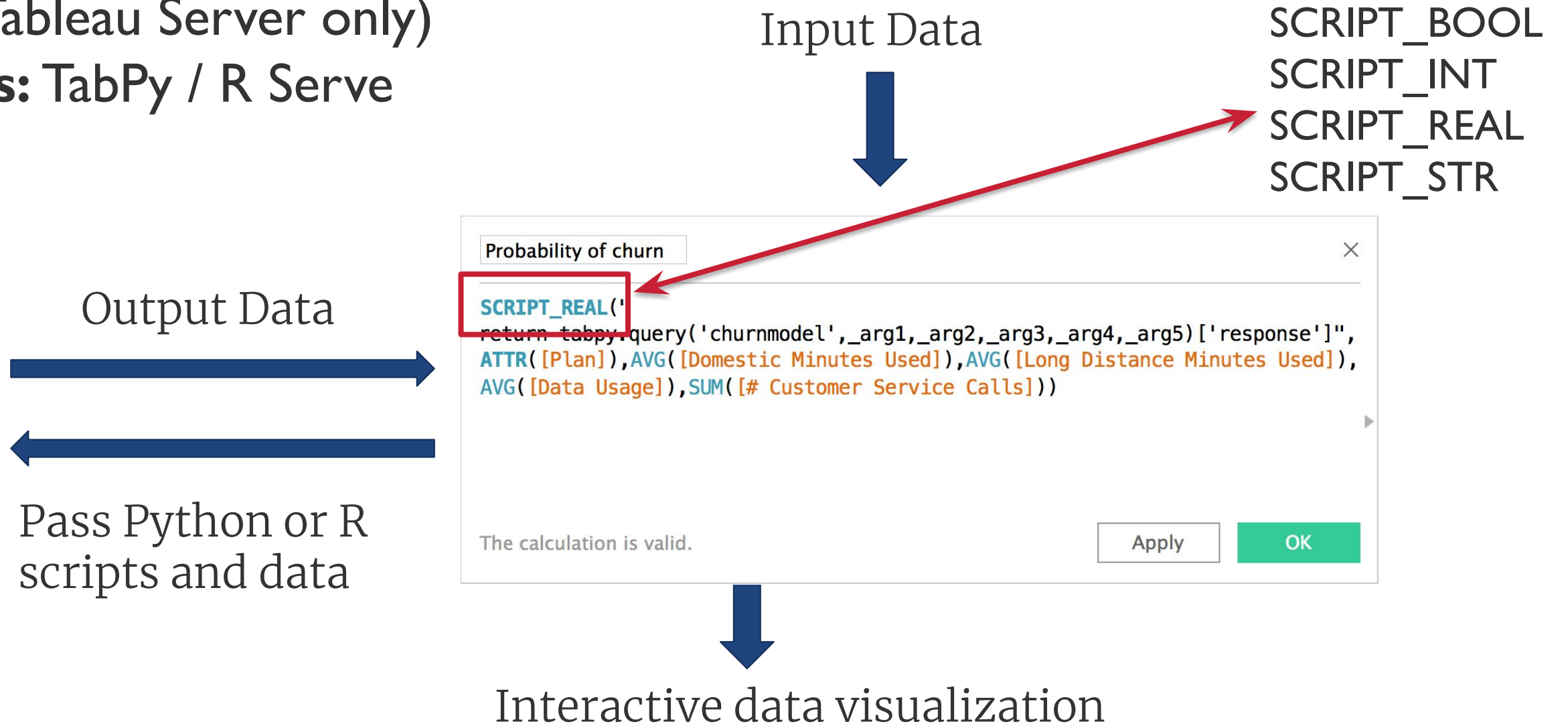
# Python & R integration

Available on:

Tableau Desktop (Tableau Server & Online)

Tableau Prep (Tableau Server only)

Dependencies: TabPy / R Serve



# Analytics Extensions API

Available: 2020.1

Available on:

Tableau Desktop (Tableau Server & Online)

Tableau Prep (Tableau Server only)

Input Data



SCRIPT\_BOOL  
SCRIPT\_INT  
SCRIPT\_REAL  
SCRIPT\_STR

Analytics Extension

Output Data



Pass Scripts And Data

The screenshot shows a Tableau interface for editing an analytics extension. The main text area contains the following script:

```
SCRIPT_REAL('irr', -1000000, SUM([Sales]))
```

A red box highlights the script text. To the right, a dropdown menu is open, showing a list of available extension functions: RANK\_PERCENTILE, RANK\_UNIQUE, REGEXP\_EXTRACT, REGEXP\_EXTRACT\_NTH, REGEXP\_MATCH, REGEXP\_REPLACE, REPLACE, RIGHT, ROUND, RTRIM, RUNNING\_AVG, RUNNING\_COUNT, RUNNING\_MAX, RUNNING\_MIN, RUNNING\_SUM, SCRIPT\_BOOL, SCRIPT\_INT, and SCRIPT\_REAL. Below the list, there are two example code blocks: an R Example and a Python Example, both demonstrating the use of the SCRIPT\_REAL function.



Interactive Data Visualization





# Tableau Developer Tools

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REST API

Webhooks

Metadata API

TSC

Hyper API

TSM

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# REST API

Programmatic access to work with your content, users, sites and more.

Provisioning  
Permissions  
Publishing

**Available:** All version of Tableau  
**Product Involved:** Tableau Server/Online  
**Coding language:** Wide language support



## Use Cases:

- Automate set up of new servers with users and sites
- Create custom portal for organizations to manage their server with just the functionality they want to expose
- Generate images from Tableau dashboards
- Programmatically publishing extract to server
- Programmatically create new subscriptions for users



# Tableau Server Client (TSC)

A Python library for the  
Tableau Server REST API

**Available:** All versions of Tableau  
**Product Involved:** Tableau Server/Online  
**Coding language:** Python



## Use Cases:

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# Tableau Services Manager (TSM)

TSM gives servers admin command-line and web-based options for configuring and maintaining Tableau Server

**Available:** From version 10.5

**Product Involved:** Tableau Server



## Use Cases:

- Backup your Production Environment
- Restore Production to Test Environment
- Server Upgrades



# Webhooks

Allows other services to respond to events that happen on Tableau Server or Online

**Available:** 2019.4

**Product Involved:** Tableau Server/Online

**Coding language:** Wide language support



## Use Cases:

- Have Alexa talk when an extract refresh fails
- Send an image of a dashboard after the extract refresh
- Start a workbook performance review when a workbook is uploaded
- Integration with Slack and other platforms



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POST Sign in (personal access token) | POST Create a webhook | GET List webhooks

▶ Create a webhook

POST `{{server}}/api/3.6/sites/{{site-id}}/webhooks`

Params | Authorization | Headers (12) | **Body** | Pre-request Script | Tests | Settings

● none ● form-data ● x-www-form-urlencoded ● raw ● binary ● GraphQL **JSON**

```

1 {
2   "webhook": {
3     "webhook-source": {
4       "{{webhook-source-api-event-name}}": {}
5     },
6     "webhook-destination": {
7       "webhook-destination-http": {
8         "method": "POST",
9         "url": "{{webhook-url}}"
10      }
11    },
12    "name": "{{webhook-name}}"
13  }
14 }

```

Body | Cookies (2) | Headers (13) | Test Results

Pretty | Raw | Preview | Visualize | JSON

```

1 {
2   "webhook": {
3     "webhook-source": {
4       "webhook-source-event-datasource-refresh-failed": {}
5     },
6     "webhook-destination": {
7       "webhook-destination-http": {
8         "method": "POST",
9         "url": "https://maker.ifttt.com/trigger/
10      }
11    },
12    "owner": {
13      "id": " ",
14      "name": " "
15    },
16    "id": " ",
17    "name": "extract-failed",
18    "isEnabled": true,
19    "statusChangeReason": ""
20  }
21 }

```

## Jobs

Failed Jobs: 4 | Completed Jobs: 2 | Cancelled Jobs: 7

Sort By: Jc

ID	Status	Priority	Task Type	Job Requested Time	Run Time (min)	Queue Time (min)
9091780	Failed	50	Extract Refresh/Creation	14 Jun 2020, 08:22	0.0	1.1



**Anya Prosvetova**  
@Anyalitica

Hi @illonage! The refresh of 'T-rex shopping list' extract failed on my #Tableau Online at June 14, 2020 at 08:23AM. #datadev



8:23 AM · Jun 14, 2020 · IFTTT



# Metadata API

A read-only GraphQL API that allows querying for resources on Tableau Server and how they relate to other assets

**Available:** 19.3

**Product Involved:** Tableau Server/Online

**Coding Skills:** Wide language support



## Use Cases:

- Understand the impact of changing or removing a data sources across an entire server
- Programmatically discover all calculated fields created from a database column
- Automatically output descriptions and formulas for all fields being used in a workbook



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Extensions API

Embedding API

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## Data Connectivity

Get any data into Tableau via custom connector or extract



# JavaScript API

Lets you display and interact with visualizations in a web page

# Extensions API

Enable Tableau users to integrate and interact with data from other application directly in Tableau



# Difference between

## JavaScript API

## Extensions API

Brings Tableau into other web applications

Brings other applications into Tableau

Needs to embed Tableau into a web page

Can be used in Desktop, Server or Online

Custom-built for each embed scenario

Can be made as a re-usable, generic-built dashboard component

JavaScript

JavaScript

# JavaScript API

# Extensions API

Urban health

## Urban Health Index (UHI) for Lambeth and Southwark

With the [Social Progress Imperative](#), we've created a set of metrics to assess the social progress of our boroughs of Lambeth and Southwark. The result of this partnership is the Urban Health Index.

By layering data relating to different social and environmental indicators, we hope to build a better picture of the circumstances of people living in urban areas and how their environment impacts their health.

The Urban Health Index provides information on 68 neighbourhoods in Lambeth and Southwark and includes the most recent data available. We capture data on 42 indicators relating to basic human needs, foundations of wellbeing and opportunity, viewable as an interactive scorecard for

The screenshot shows a Tableau dashboard with a Super Mario Bros. extension overlay. The dashboard displays a bar chart titled "Income By Region" for the year 2012, with a legend for Oceania. The extension overlay includes a "reset" button, a "click in the white box to start -> playing with the arrow keys" instruction, and a "This extensions is developed by: The developers of appsfortableau.com the platform for Tableau Extensions" notice. The extension also features a "apps for tableau" logo and two developer portraits.

Region	Income
Spain	\$57B
France	\$56B
United	
Italy	\$40B

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Embedding API

Mobile App Bootstrap

REST API

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# JavaScript API

**Actions** ×

- Export to PDF
- Export Image
- Export Crosstab
- Export Data
- Revert All
- Download

**Switch Sheet** ×

- Campus Diversity
- Diversity in Institutions
- Colleges

**Navigate** ×

- Back to Workbooks

Ethnicity ... Two or More Races

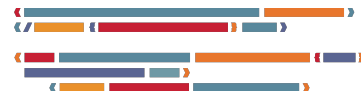
Y-Axis Sp... Region

First X-Ax... Urbanization

Second X... Control

To use this visualization: Select an ethnicity at top left. Then decide how you want the categories to break out by using the Y- and X-axis split controls. Reset at bottom. Hover over a box for details. Click the box to list the institutions at the bottom

Tableau	Diversity in Institutions: Hover over a box for details											
	City			Rural			Suburb			Town		
	Public	Private not-for-profit	Private for-profit	Public	Private not-for-profit	Private for-profit	Public	Private not-for-profit	Private for-profit	Public	Private not-for-profit	Private for-profit
Far West AK CA HI NV OR	4.8% 119	5.4% 119	3.6% 353	4.0% 27	4.8% 10	4.6% 5	4.8% 83	6.1% 52	2.8% 165	5.8% 25	6.7% 7	4.1% 6
Great Lakes IL IN MI OH WI	2.2% 80	2.8% 114	2.3% 230	1.5% 79	1.1% 17	1.2% 5	2.4% 61	2.6% 67	2.0% 271	2.0% 48	2.2% 58	0.9% 36
Mid East DE DC MD NJ NY PA	1.8% 70	2.6% 188	1.3% 168	1.8% 55	1.9% 11	3.3% 5	2.1% 104	1.9% 137	2.0% 255	2.0% 46	1.8% 30	1.8% 18
New England CT ME MA NH RI VT	2.1% 31	2.9% 69	2.5% 39	1.8% 14	2.1% 15	8.2% 3	2.3% 47	2.1% 46	2.4% 93	1.8% 17	4.5% 12	1.2% 7
Plains IA KS MN MO NE ND SD	2.7% 55	2.7% 79	1.3% 154	1.5% 31	1.3% 17	2.6% 11	3.2% 12	2.1% 19	2.4% 78	2.1% 94	1.9% 53	2.7% 30
Rocky Mountains CO ID MT UT WY	2.9% 32	3.0% 26	3.4% 90	2.2% 9	0.1% 3	0.0% 3	2.8% 9	2.6% 8	3.3% 57	2.0% 30	5.8% 2	2.0% 17
Southeast AL AR FL GA KY LA MS NC SC TN VA WV	2.6% 192	2.1% 175	1.8% 459	1.7% 104	1.4% 34	1.6% 18	2.3% 95	2.0% 79	3.5% 307	1.6% 148	1.3% 60	3.0% 60
Southwest AZ NM OK TX	2.3% 89	2.6% 49	2.0% 335	2.3% 60	3.7% 9	0.9% 8	2.9% 22	1.9% 16	3.1% 68	3.3% 71	3.3% 12	1.0% 21

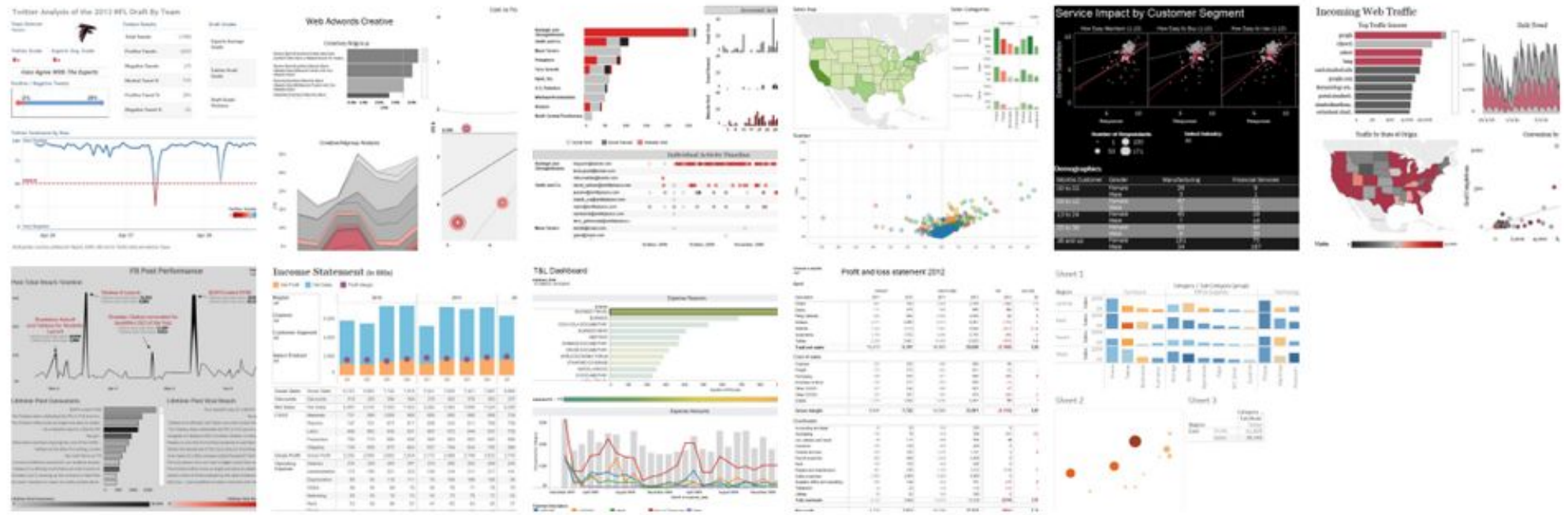


# REST API

## Reporting Center

Choose from a reporting category to work with our interactive reports

- ALL REPORTS
- SOCIAL MEDIA
- WEB ANALYTICS
- E-MAIL OPTIMIZATION
- SALES
- FINANCE



# Custom Mobile Apps: Mobile App Bootstrap

Embed Tableau visualizations in your own mobile app



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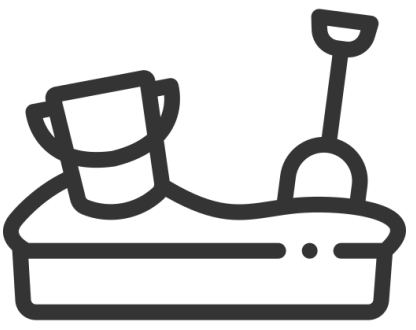
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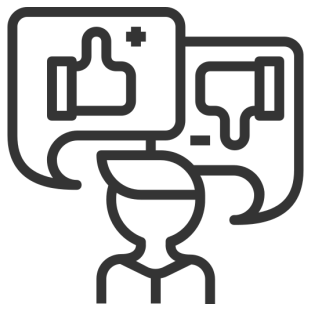
# Join the **Tableau Developer Program!**



**Early API Access**



**Free Development Site**



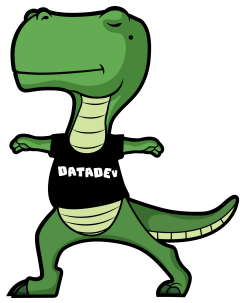
**Engineering Team Connection**



**First to know**



**Community**



**Wake up the T-Rex in you**



# Tableau Developer Program

Innovate, create, and make Tableau work perfectly for your organization

JOIN US

Already a member? [Sign In](#)

Developer Program Portal

Tools, APIs, SDKs ▾

Events

Learning Resources

Community

<https://www.tableau.com/developer>



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# Bingo!

Solve one challenge in each row, starting with "B"

B	I	N	G	O
Learn the basics of Embedding	Add functionality to your embedded page	Add visualizations to text	Set up a Webhook	Get the Tableau Viz LWC Badge
Create a basic embedded page	Select marks and get data	Build your own portal with Tableau recommendations	Automate adding users	Slack me this dashboard

<https://www.tableau.com/developer/mini-challenges>



# Don't forget to have fun!



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