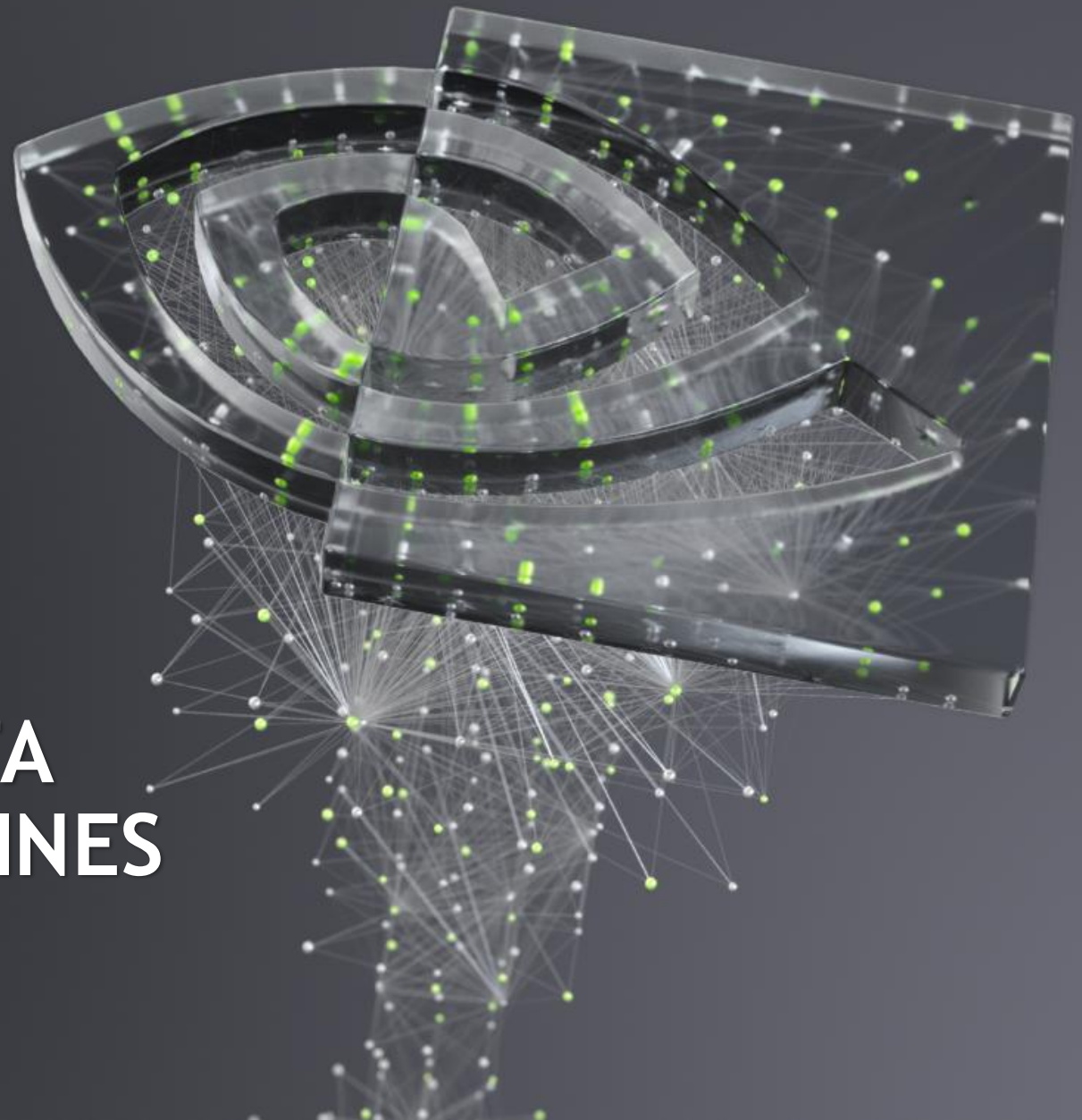


NVIDIA | DEEP LEARNING INSTITUTE

ACCELERATING DATA ENGINEERING PIPELINES

Part 3: Data Visualization

AGENDA

- Part 1: Data Formats
- Part 2: ETL with NVTabular
- Part 3: Data Visualization

AGENDA – PART 3

- Data Quality
- Interactive Dashboards
- Plotly

DATA QUALITY

BECOMING A DATA DETECTIVE

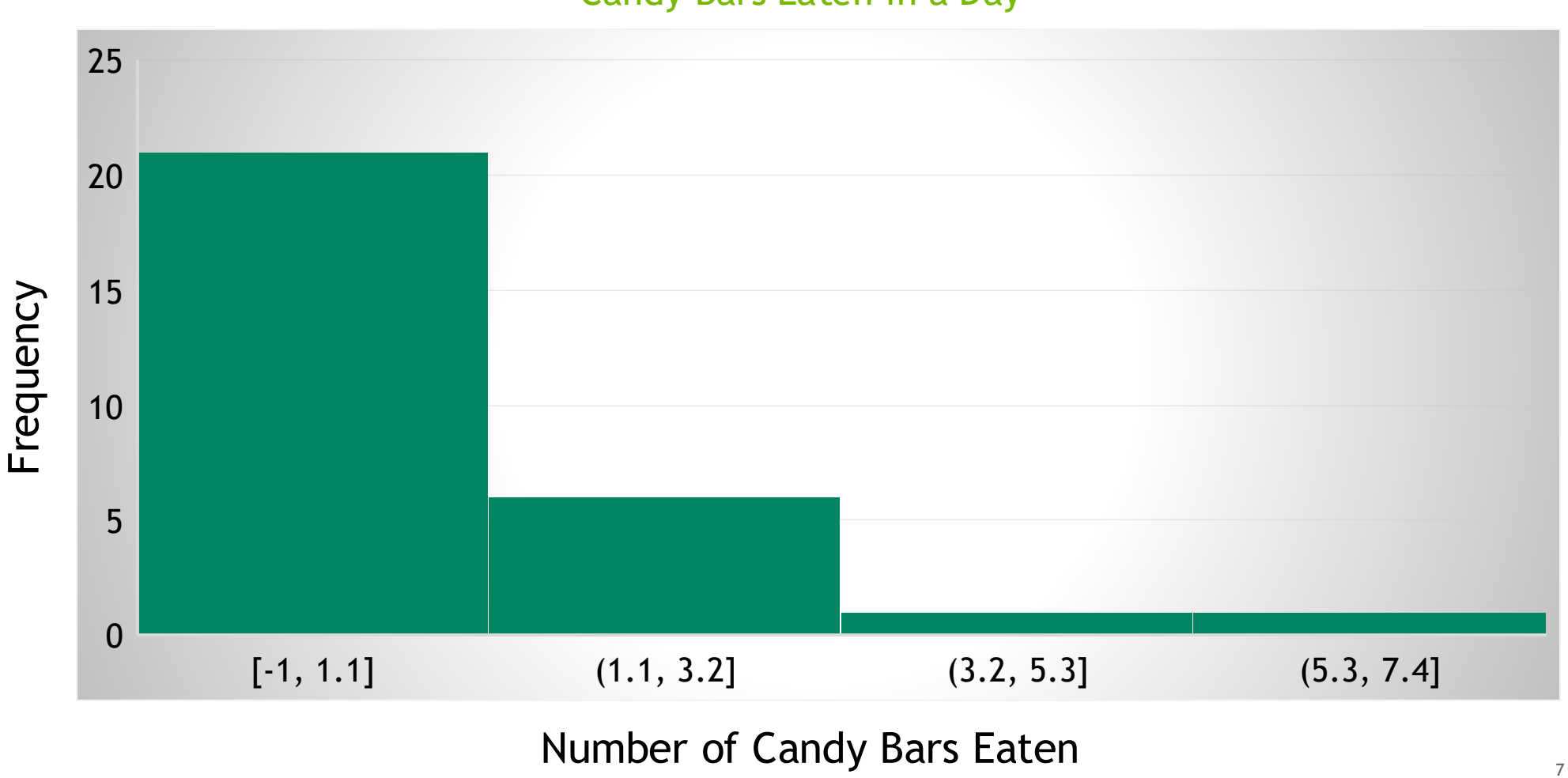
What is wrong with the following data?

WHAT IS WRONG WITH THIS DATA?

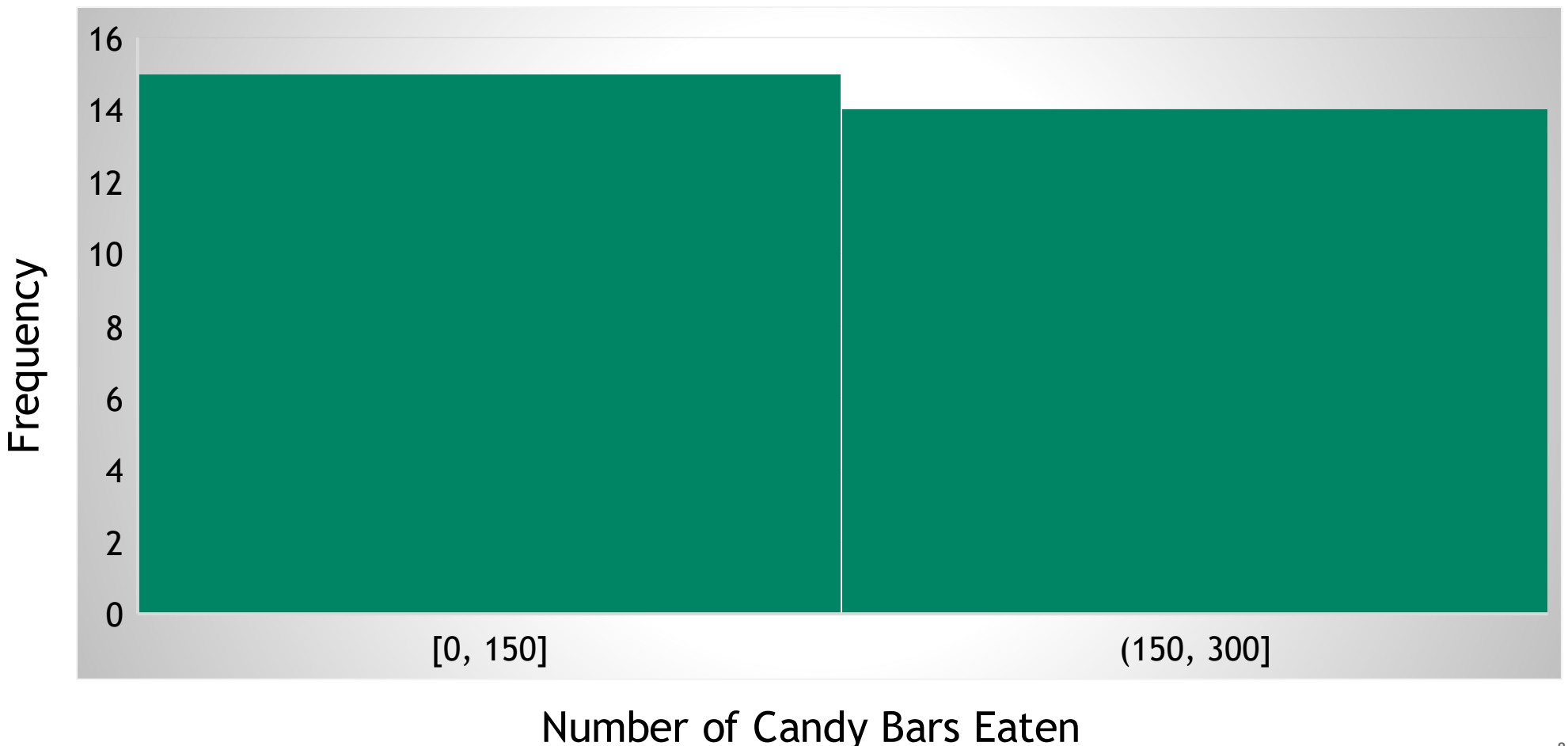
North America Temperature

Temperature	Mexico City, Mexico	Washington, DC, USA	Ottawa, Canada
Average	14	36	-7
Median	12	37	-8
Mode	12	36	-8
Min	5	25	-14
Max	22	43	-5

WHAT IS WRONG WITH THIS DATA?

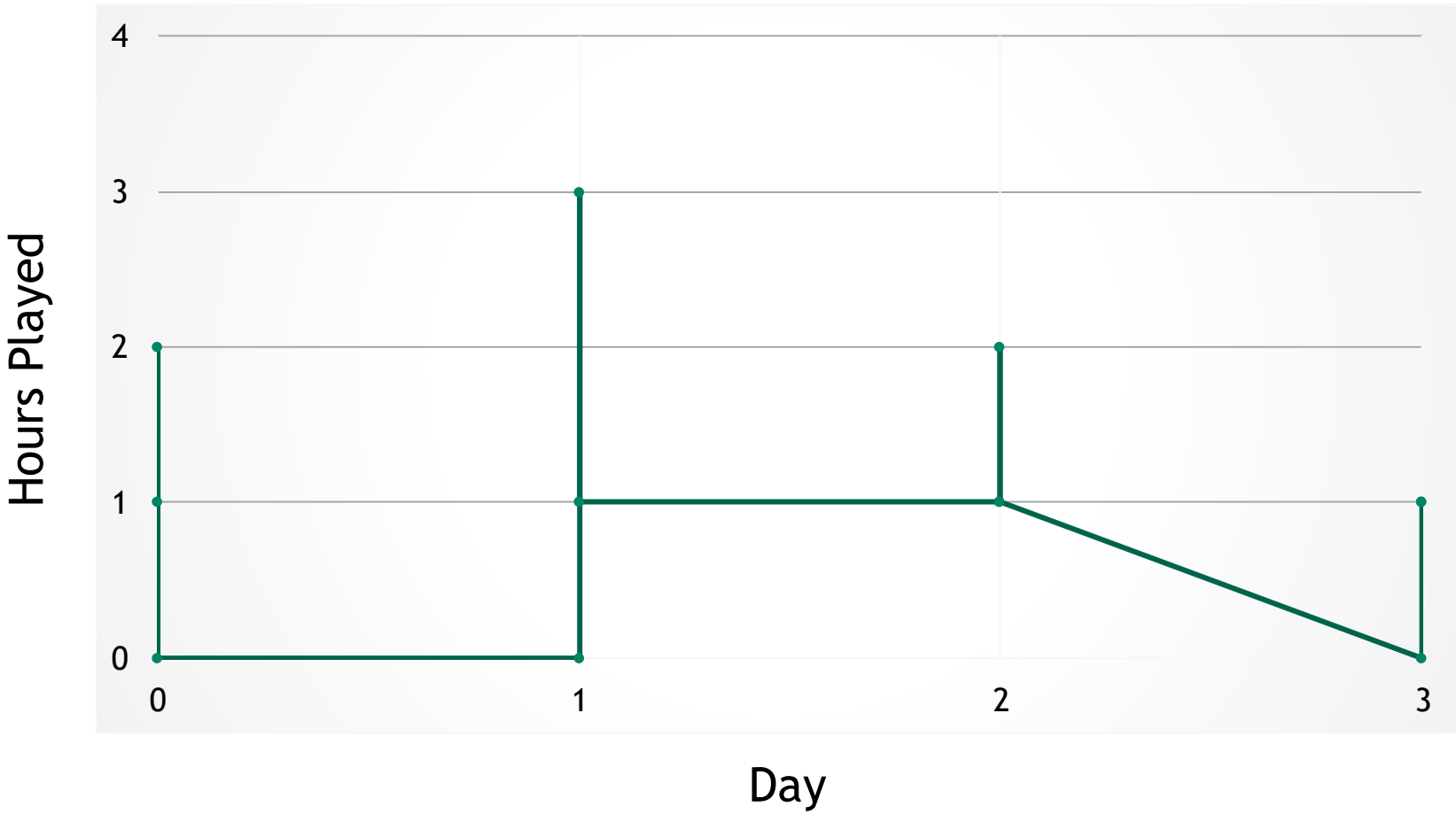


WHAT IS WRONG WITH THIS DATA?



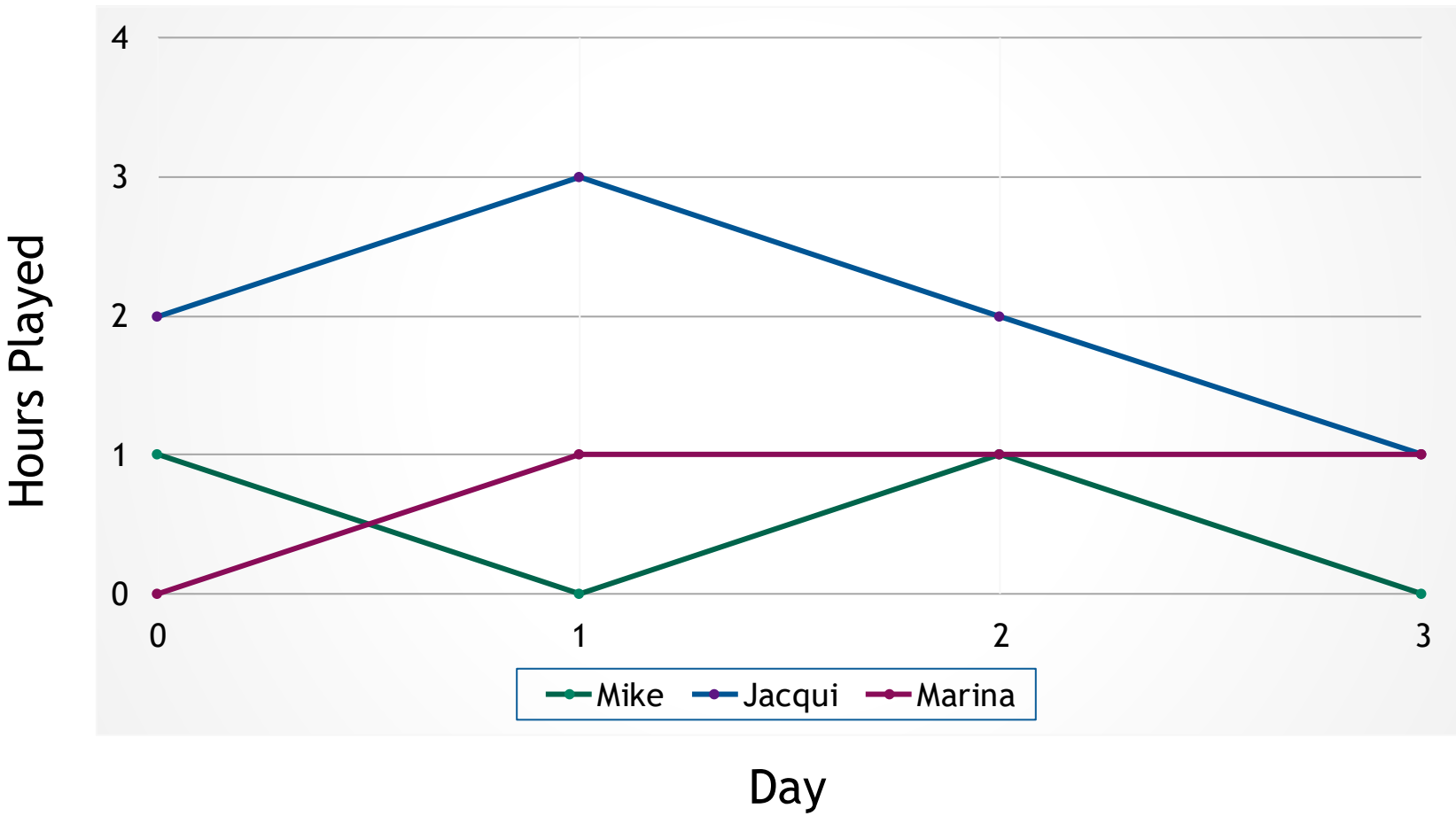
WHAT IS WRONG WITH THIS DATA?

Hours Playing Video Games



NVIDIA DEEP LEARNING INSTITUTE

WHAT IS WRONG WITH THIS DATA?



WHAT IS WRONG WITH THIS DATA?

United States Precipitation

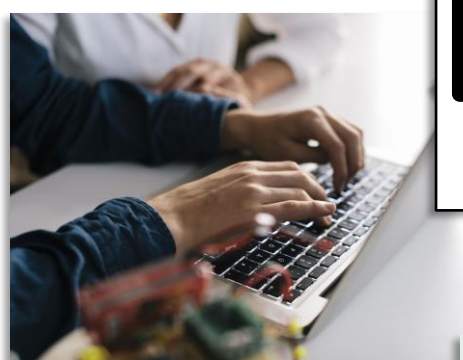
INTERACTIVE DASHBOARDS

THE INTERNET

The world's largest system of digital data?

A DASHBOARD DATA PIPELINE

A Simple Server



Client

1: User asks for information

2: Server returns webpage with all data

3: User's computer filters data for interactivity

Server

DASHBOARDS FOR BIG DATA

A More Complex Server

Client

1: User asks for information

2: Server returns webpage

3: User requests filtered data

6: server returns filtered data

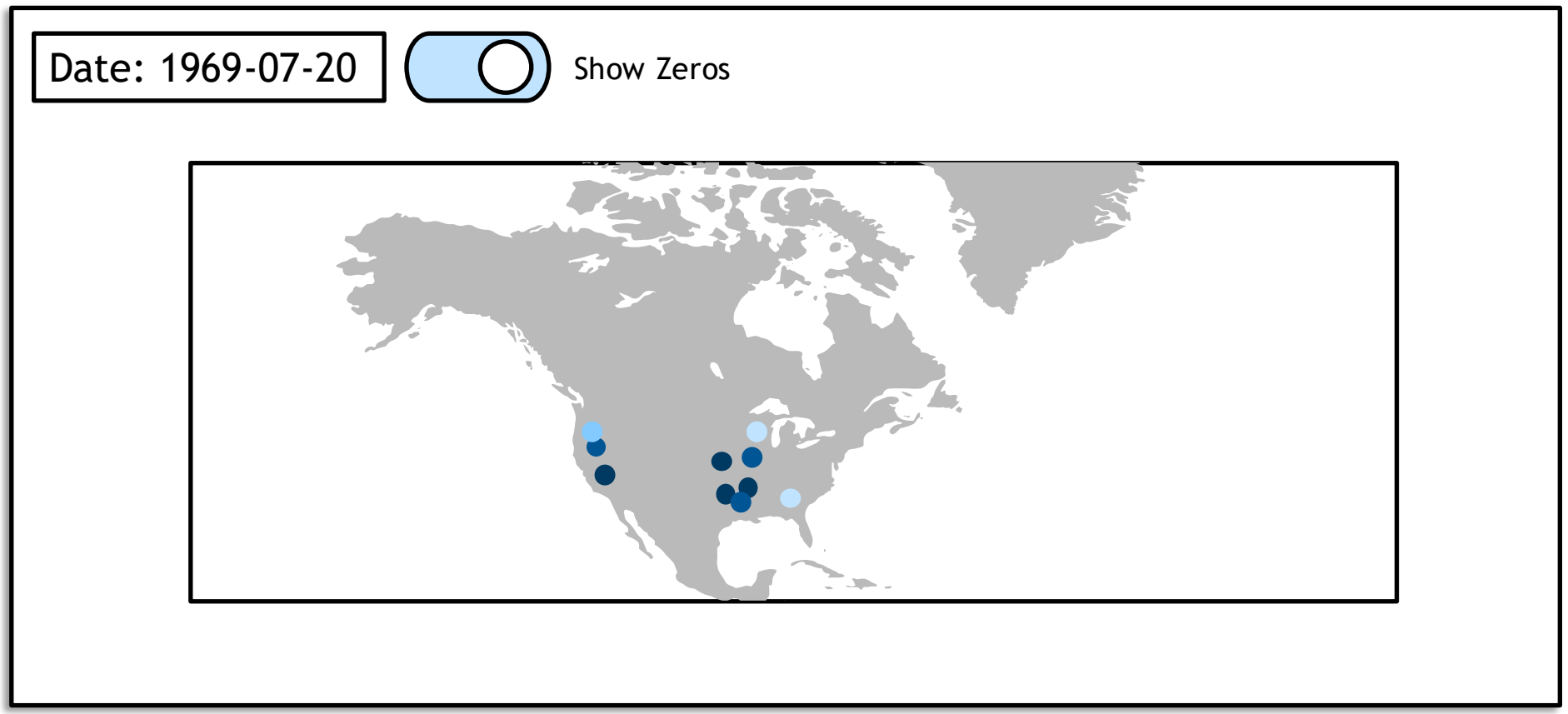
Server CPU

4: CPU requests computation from GPU

5: GPU returns result

Server GPU

MAKING A GOOD DASHBOARD



PLOTLY DASH

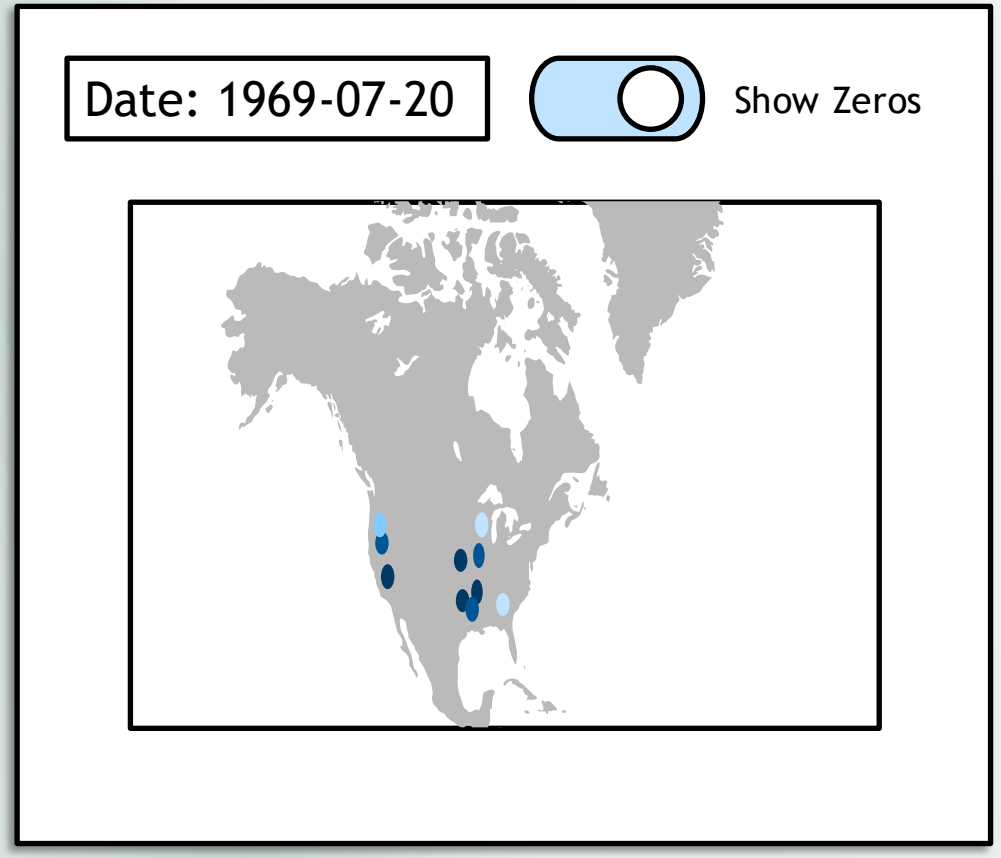
PLOTLY DASH

The front end for ML and data science models

- **plotly.py** is an interactive, open-source, and browser-based graphing library for Python
- Supports line plots, scatter plots, area charts, bar charts, error bars, box plots, histograms, heatmaps, subplots, multiple-axes, polar charts, and bubble charts.

https://github.com/plotly/plotly.py

MAKING A GOOD DASHBOARD



Div

Div

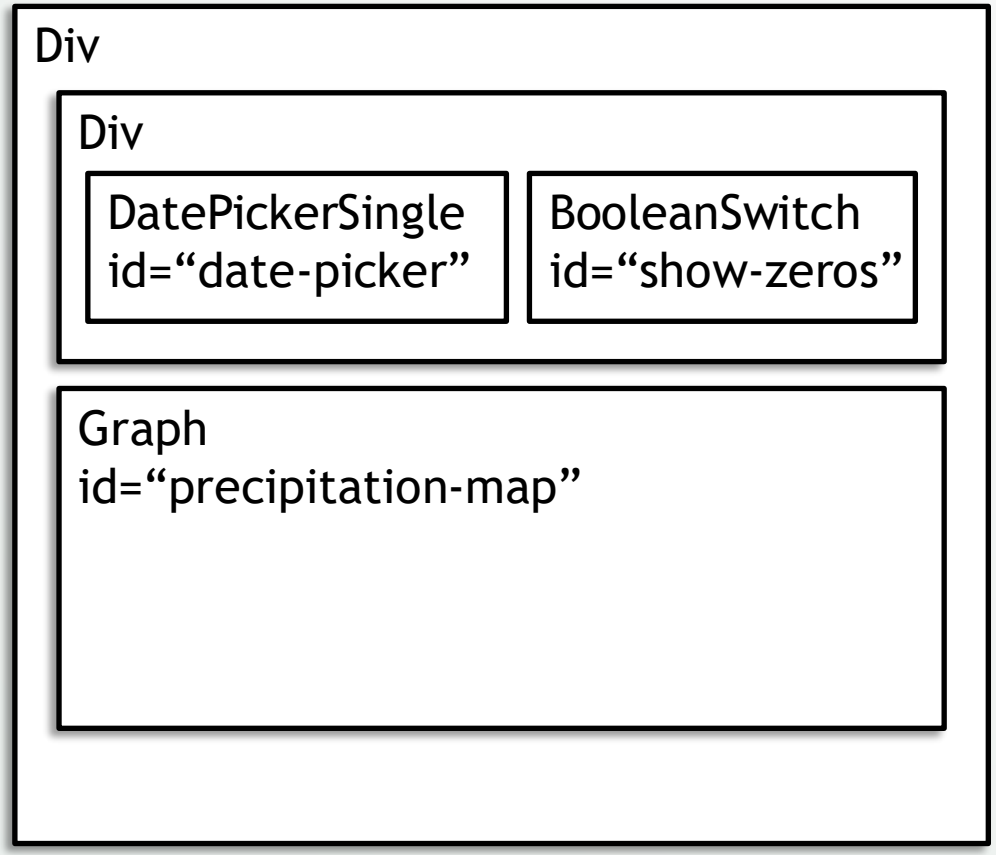
DatePickerSingle
id="date-picker"

BooleanSwitch
id="show-zeros"

Graph
id="precipitation-map"

MAKING A GOOD DASHBOARD

```
app.layout = html.Div([
    html.Div([
        dcc.DatePickerSingle(
            id='date-picker',
            min_date_allowed=date_min,
            max_date_allowed=date_max,
            initial_visible_month=initial_date,
            date=initial_date
        ),
        daq.BooleanSwitch(
            id='show-zeros',
            on=True,
            label="Show Zeros",
            style={'display': 'inline-block'}
        )
    ]),
    dcc.Graph(id='precipitation-map')
])
```



MAKING A GOOD DASHBOARD

```
app.layout = html.Div([
    html.Div([
        dcc.DatePickerSingle(
            id='date-picker',
            min_date_allowed=date_min,
            max_date_allowed=date_max,
            initial_visible_month=initial_date,
            date=initial_date
        ),
        daq.BooleanSwitch(
            id='show-zeros',
            on=True,
            label="Show Zeros",
            style={'display': 'inline-block'}
        )
    ]),
    dcc.Graph(id='precipitation-map')
])
```

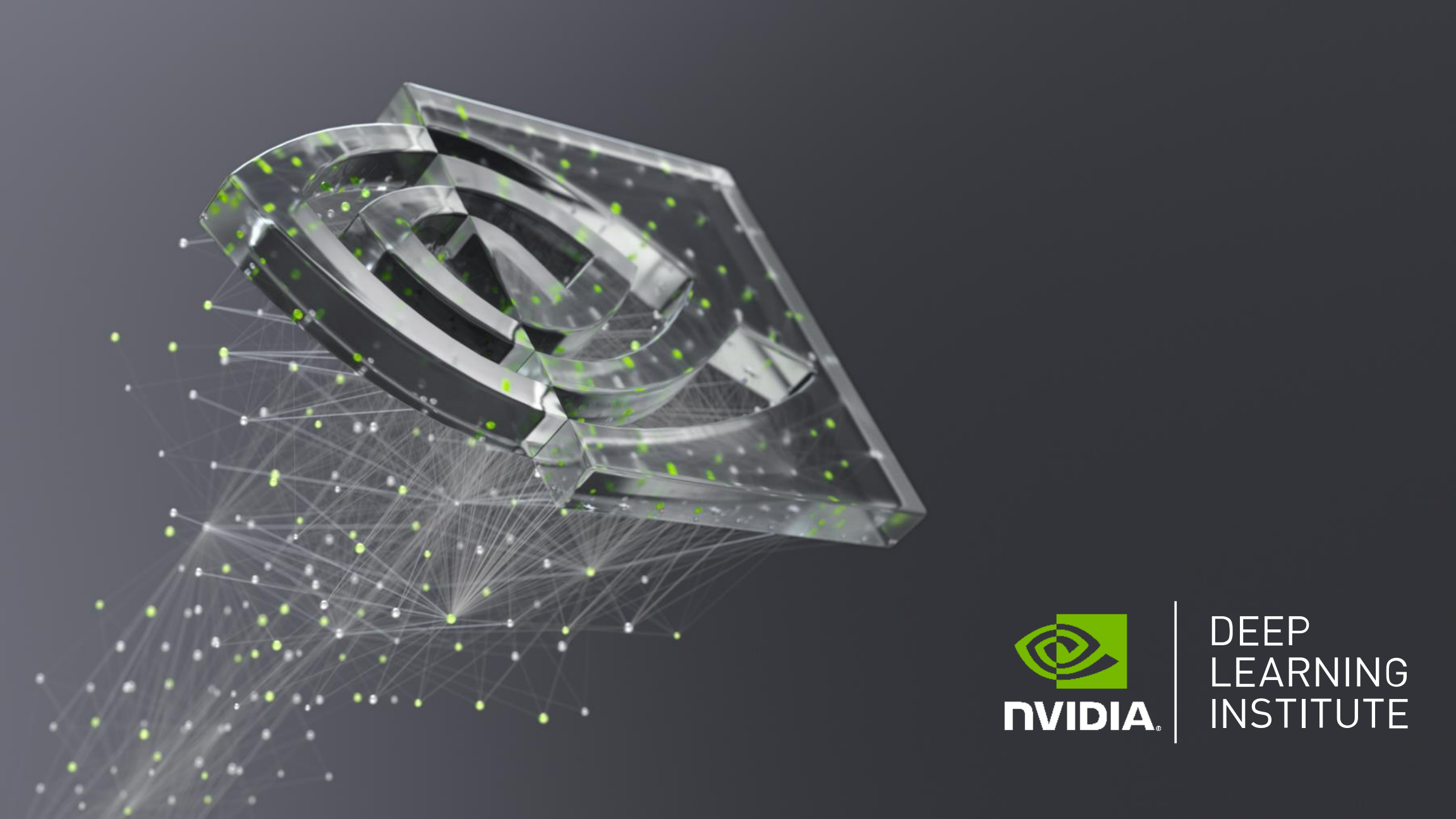
```
@app.callback(
  Output(‘precipitation-map`, `figure`),
  [Input(‘date-picker’, ‘date’), # 1st input
  Input(‘show-zeros’, ‘on’)])    # 2nd input
def make_graph(first_input, second_input):
  …

  regular python function stuff

  …

  return fig  # Must match Output data type
```

LET’S GO!


NVIDIA
DEEP
LEARNING
INSTITUTE