R, Python, and Tableau

A Love Triangle

James Blair
Product Manager, Posit PBC

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Photo by Geert Pieters on Unsplash

Photo by Samuel Sianipar on Unsplash

Photo by Geert Pieters on Unsplash

Photo by Samuel Sianipar on Unsplash

Photo by Geert Pieters on Unsplash

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Tableau - Music Dashboard

Entire View

Show Me

Pages

Columns: Attribute One, X axis

Rows: Attribute Two, Y axis

Data

Analytics

Filters

Music Genre

Marks

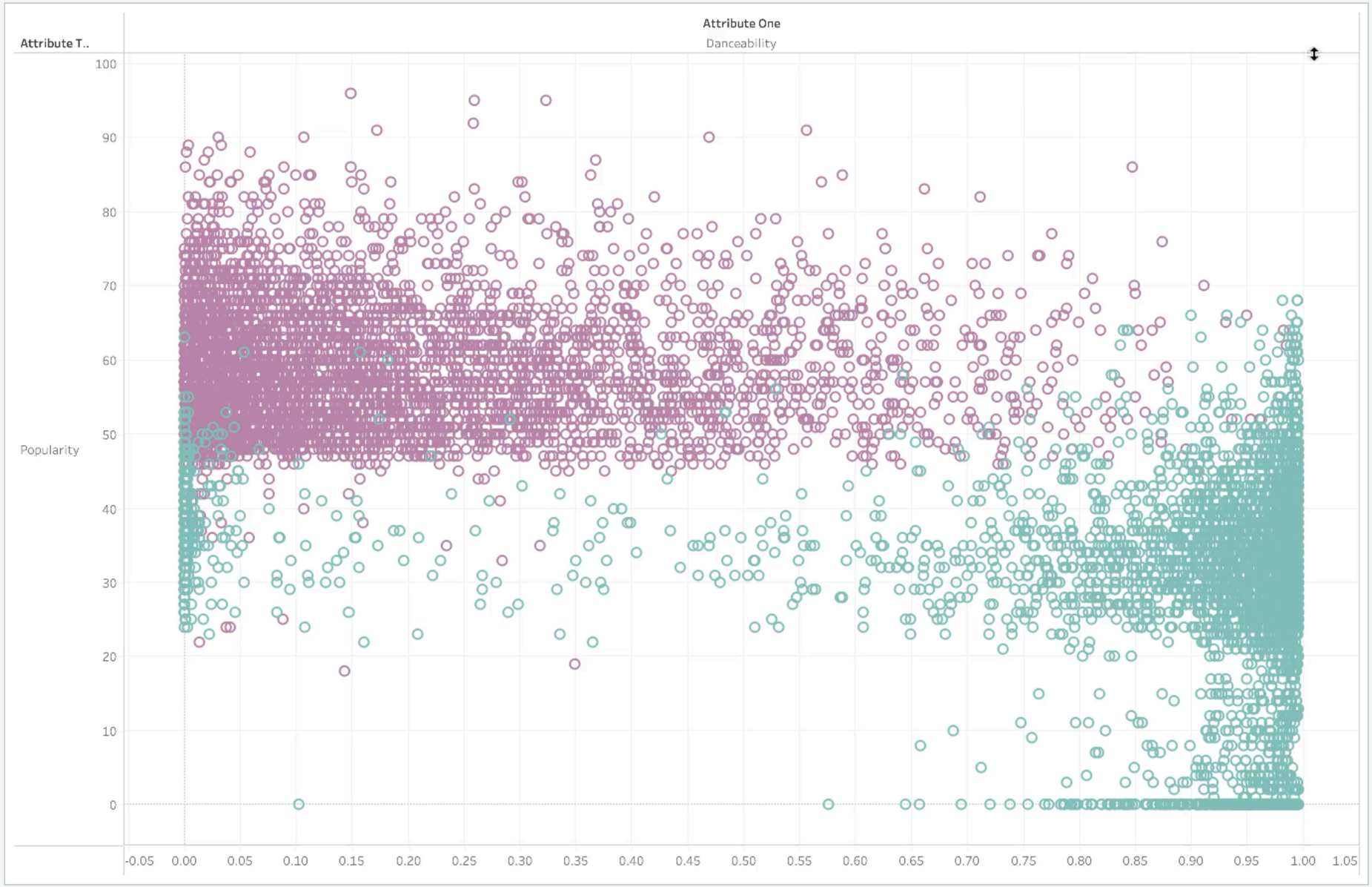
Automatic

Color | Size | Label

Detail | Tooltip | Shape

Music Genre

Track Name



Music Genre

Classical

Hip-Hop

Music Genre

(All)

Alternative

Anime

Blues

Classical

Country

Electronic

Hip-Hop

Jazz

Rap

Rock

Highlight Music Genre

Highlight Music Genre

Attribute One

Danceability

Attribute Two

Popularity

Data Source | Scatter | R RF | Python RF | Music Explorer

10000 marks | 1 row by 1 column | SUM(X axis): 5,119.6657

James Blair

A random Forest

A random Forest

```r
library(ranger)

rf_fit <- function(x, y) {
  train_data <- data.frame(x = x, y = y)
  fit <- ranger(y ~ x, data = train_data)
  predictions(fit)
}
```

plumber

```r
library(plumber)
library(ranger)

#* @apiTitle Tableau Random Forest
#* @apiDescription Fit simple random forest model to input data

#* Fit random forest to input data
#* @post /rf
rf_fit <- function(x, y) {
  train_data <- data.frame(x = x, y = y)
  fit <- ranger(y ~ x, data = train_data)
  predictions(fit)
}
```

plumbertableau

```r
library(plumber)
library(plumbertableau)
library(ranger)

#* @apiTitle Tableau Random Forest
#* @apiDescription Fit simple random forest model to input data

#* Fit random forest to input data
#* @tableauArg x:numeric independent variable
#* @tableauArg y:any dependent variable
#* @tableauReturn numeric Predicted output from fit model
#* @post /rf
rf_fit <- function(x, y) {
  train_data <- data.frame(x = x, y = y)
  fit <- ranger(y ~ x, data = train_data)
  predictions(fit)
}

#* @plumber
tableau_extension
```

A random Forest

```python
from typing import List

from sklearn.ensemble import RandomForestRegressor
import numpy as np

def rf(x: List[float], y: List[float]) -> List[float]:
    X = np.array(x).reshape(-1, 1)
    regr = RandomForestRegressor()
    regr.fit(X, y)
    preds = regr.predict(X)
    return preds.tolist()
```

A random Forest

```python
from typing import List

from sklearn.ensemble import RandomForestRegressor
import numpy as np

def rf(x: List[float], y: List[float]) -> List[float]:
    X = np.array(x).reshape(-1, 1)
    regr = RandomForestRegressor()
    regr.fit(X, y)
    preds = regr.predict(X)
    return preds.tolist()
```

fastapi

```python
from typing import List

from fastapi import FastAPI
from sklearn.ensemble import RandomForestRegressor
import numpy as np

app = FastAPI()

@app.post("/rf")
def rf(x: List[float], y: List[float]) -> List[float]:
    X = np.array(x).reshape(-1, 1)
    regr = RandomForestRegressor()
    regr.fit(X, y)
    preds = regr.predict(X)
    return preds.tolist()
```

fastapitableau

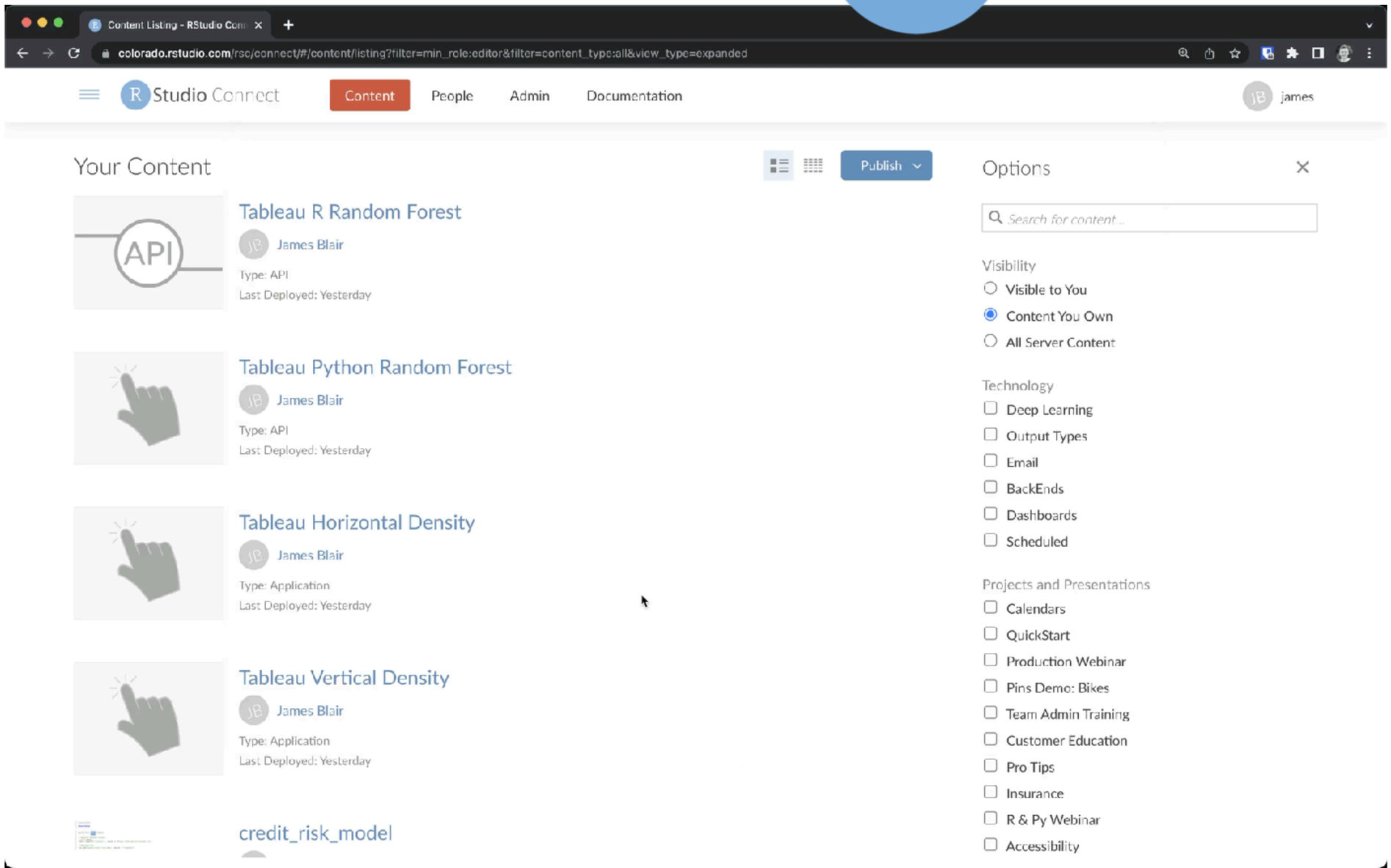
```python
from typing import List

from fastapitableau import FastAPITableau
from sklearn.ensemble import RandomForestRegressor
import numpy as np

app = FastAPITableau(
    title="Random Forest Regression",
    description="Fit a random forest to the input data",
    version="0.1.0"
)

@app.post("/rf")
def rf(x: List[float], y: List[float]) -> List[float]:
    X = np.array(x).reshape(-1, 1)
    regr = RandomForestRegressor()
    regr.fit(X, y)
    preds = regr.predict(X)
    return preds.tolist()
```

RStudio Connect



Tableau

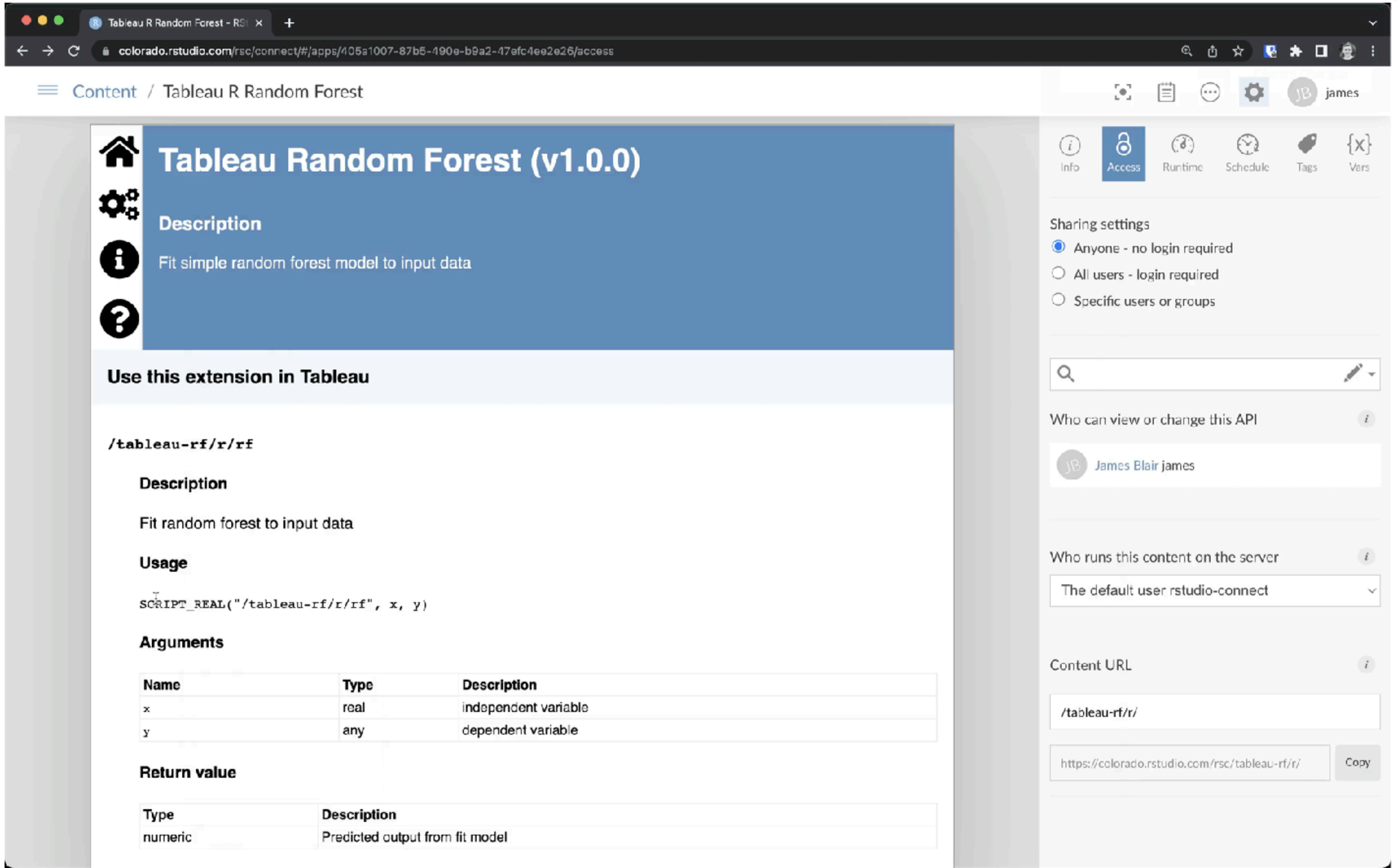


Tableau R Random Forest - RSI
colorado.rstudio.com/rsc/connect/#/apps/405a1007-87b5-490e-b9a2-47afc4ee2e26/access
Content / Tableau R Random Forest
james
Tableau Random Forest (v1.0.0)
Description
Fit simple random forest model to input data
Use this extension in Tableau
/tableau-rf/r/rf
Description
Fit random forest to input data
Usage
SCRIPT_REAL("/tableau-rf/r/rf", x, y)
Arguments
Name | Type | Description
x | real | independent variable
y | any | dependent variable
Return value
Type | Description
numeric | Predicted output from fit model
Info
Access
Runtime
Schedule
Tags
Vers
Sharing settings
Anyone - no login required
All users - login required
Specific users or groups
Who can view or change this API
James Blair james
Who runs this content on the server
The default user rstudio-connect
Content URL
/tableau-rf/r/
https://colorado.rstudio.com/rsc/tableau-rf/r/
Copy

All together now

Photo by Manuel Nägeli on Unsplash

Tableau - Music Dashboard

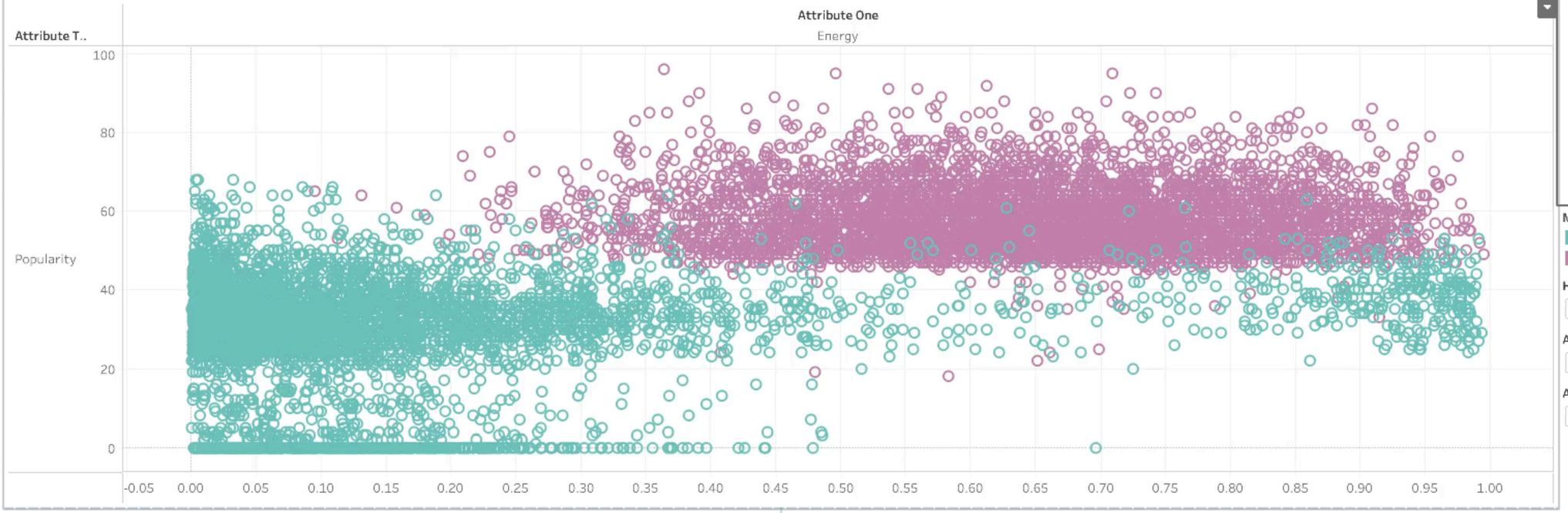
Entire View

Show Me

Dashboard

Layout

Music Attribute Explorer



Music Genre

- (All)
- Alternative
- Anime
- Blues
- Classical
- Country
- Electronic
- Hip-Hop
- Jazz
- Rap
- Rock

Music Genre

- Classical
- Hip-Hop

Highlight Music Genre

Highlight Music Genre

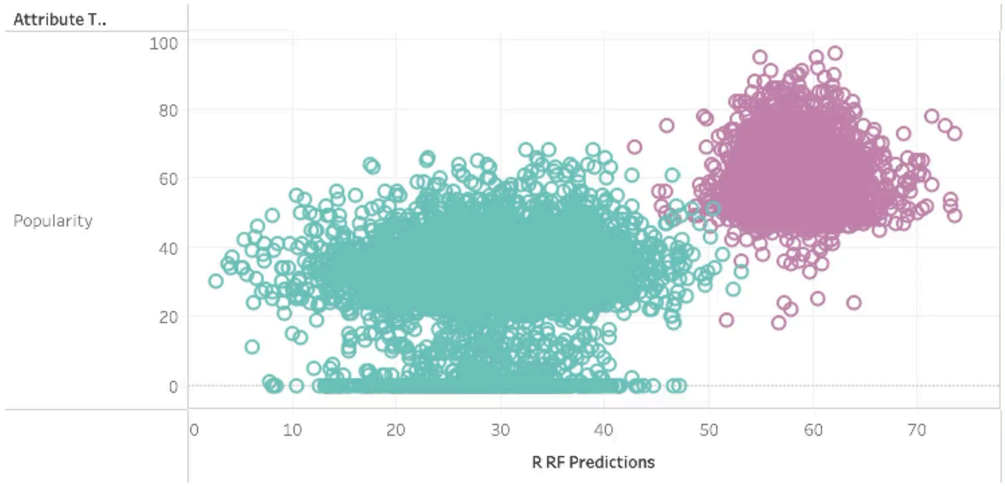
Attribute One

Energy

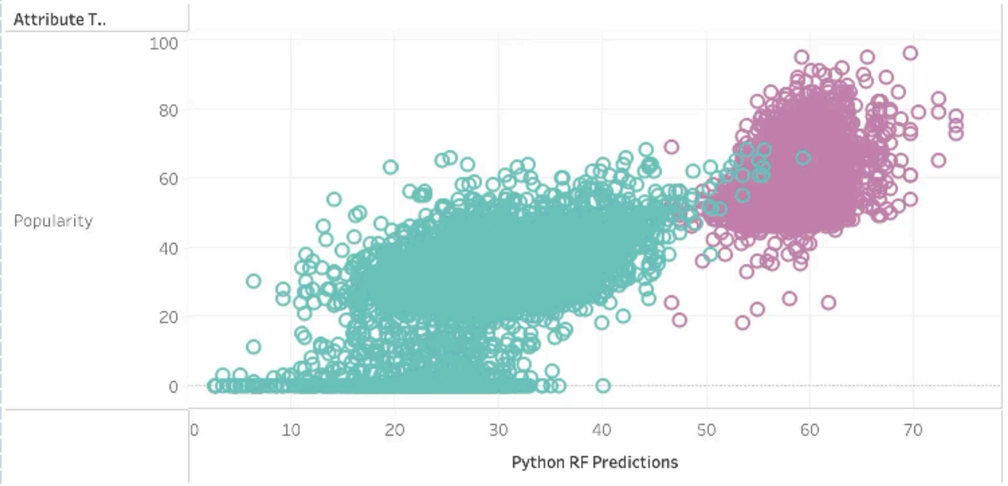
Attribute Two

Popularity

R RF Model



Python RF Model



Data Source | Scatter | R RF | Python RF | Music Explorer

10000 marks | 1 row by 1 column | SUM(X axis): 4,104.3423

James Blair

Tableau - Music Dashboard

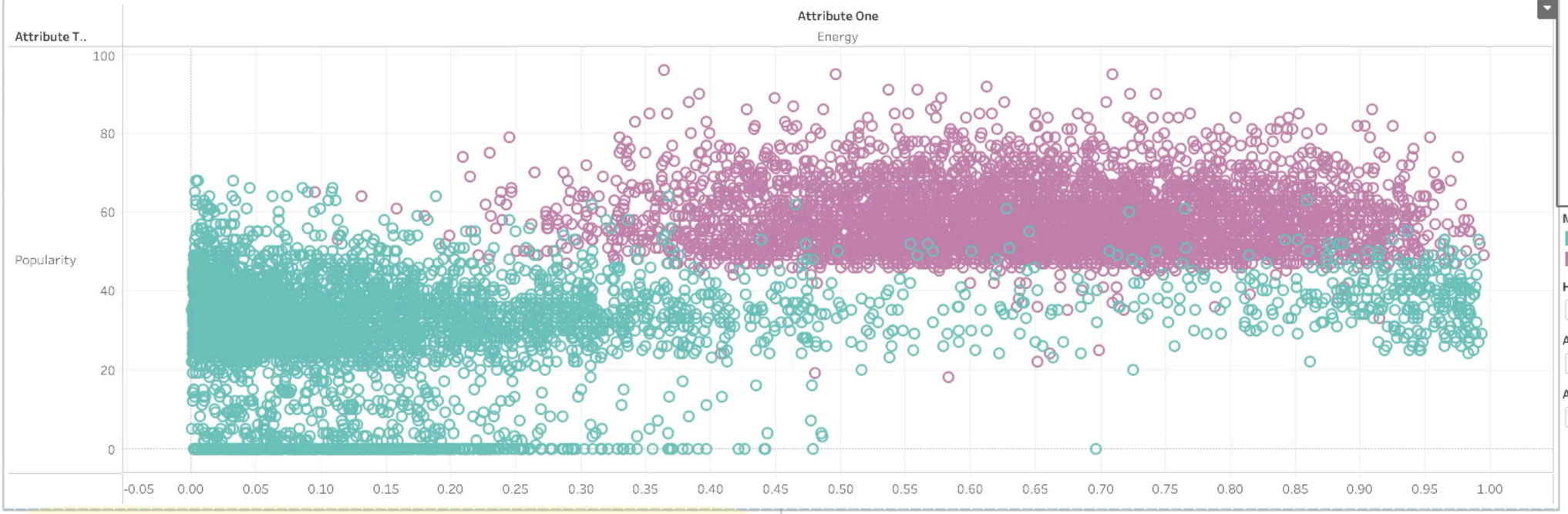
Entire View

Show Me

Dashboard

Layout

Music Attribute Explorer



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Highlight Music Genre

Highlight Music Genre

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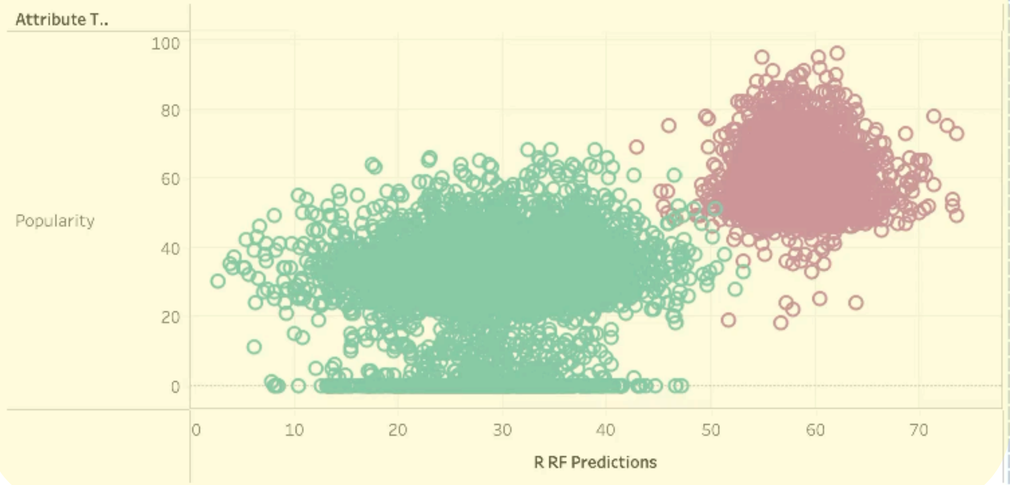
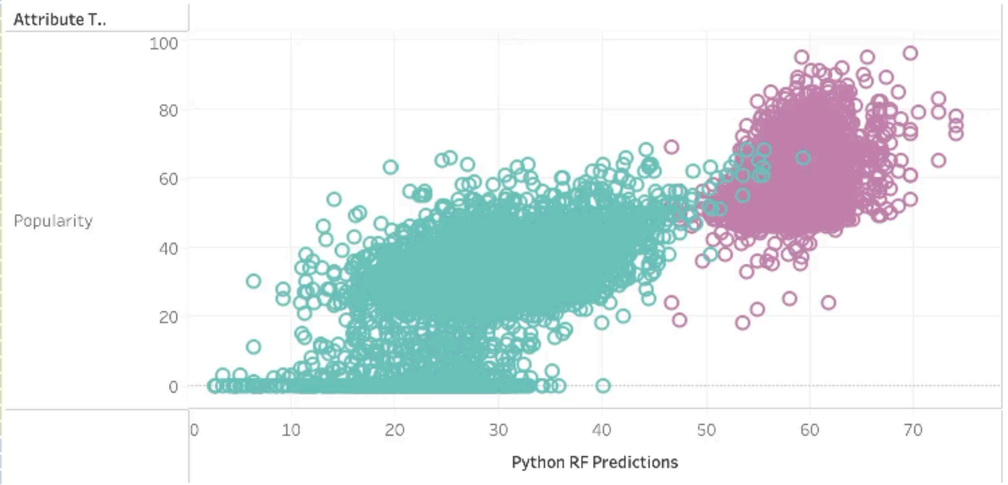
Popularity

R RF Model



Python RF Model



Data Source | Scatter | R RF | Python RF | Music Explorer

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James Blair

Tableau - Music Dashboard

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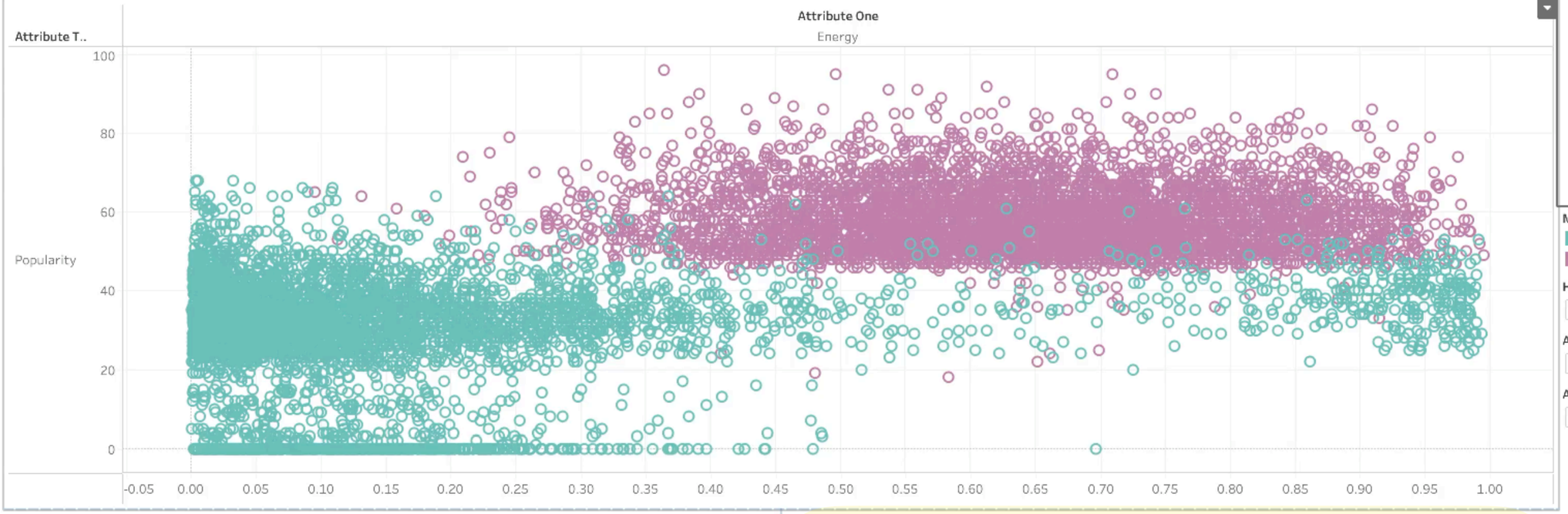
Music Attribute Explorer



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Highlight Music Genre

Highlight Music Genre

Attribute One

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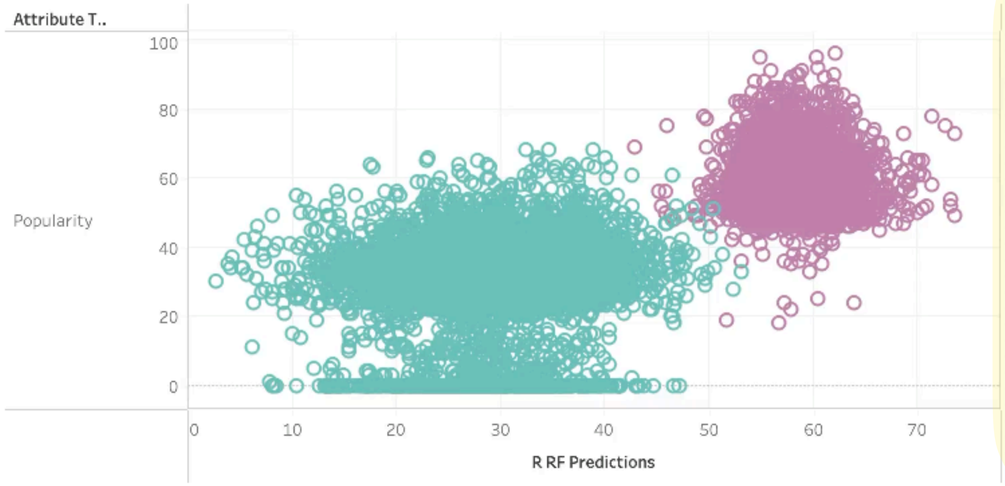
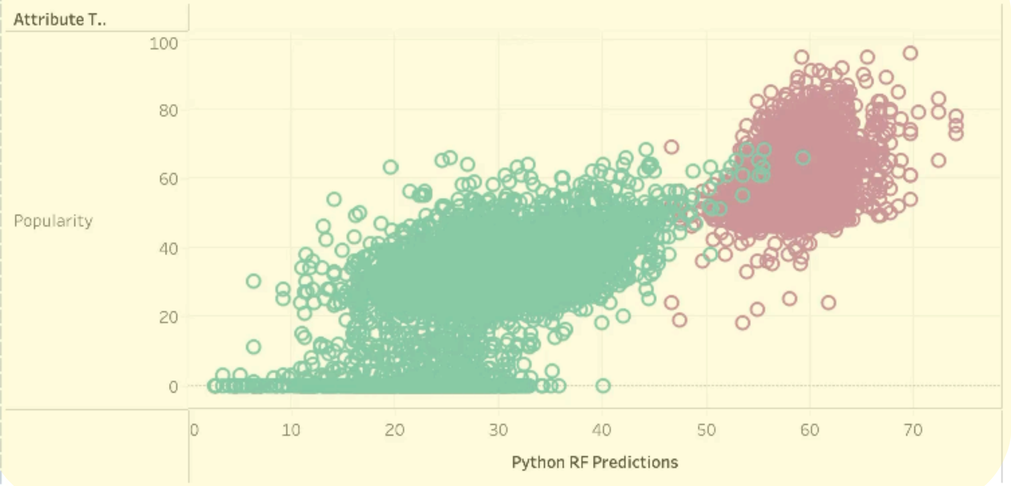
Popularity

R RF Model



Python RF Model



Data Source | Scatter | R RF | Python RF | Music Explorer

10000 marks | 1 row by 1 column | SUM(X axis): 4,104.3423

James Blair

shinytableau

```yaml
extension_id: com.rstudio.extensions.horizontal-density-plot
extension_version: 0.1.0
name: Horizontal Density Plot
description: Density Plot for Tableau
extended_description: |
  An extension for creating a horizontal density plot for use within Tablaeu
  workbooks.
author_name: James Blair
author_email: james@rstudio.com
author_organization: RStudio
website: https://www.rstudio.com/

icon:
  file: default_icon.png
  package: shinytableau

permissions: full data

min_api_version: '1.4'
```

Once more, from the top

Photo by Kazuo ota on Unsplash

Tableau - Music Dashboard

Show Me

Dashboard | Layout

Default
Phone

Device Preview

Size

Automatic

Sheets

- Scatter
- R RF
- Python RF

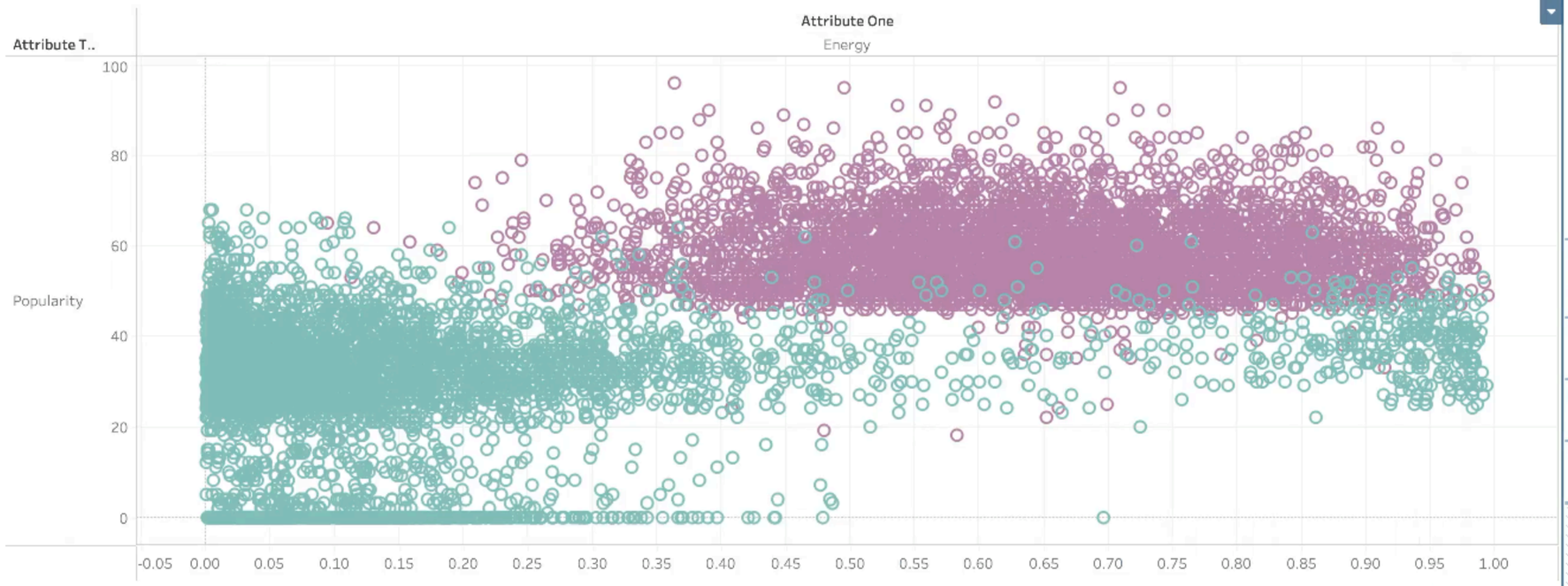
Objects

- Horizontal
- Vertical
- Text
- Image
- Web Page
- Data Story
- Blank
- Navigation
- Download
- Extension
- Ask Data

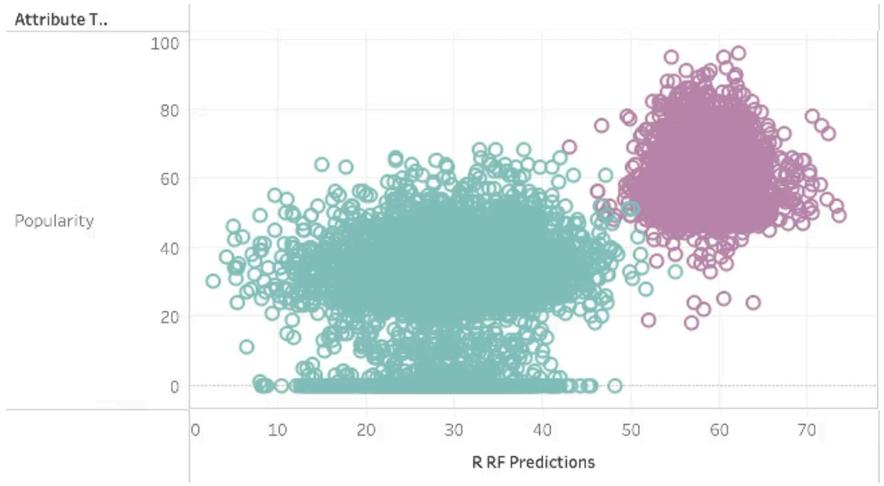
Tiled | Floating

Show dashboard title

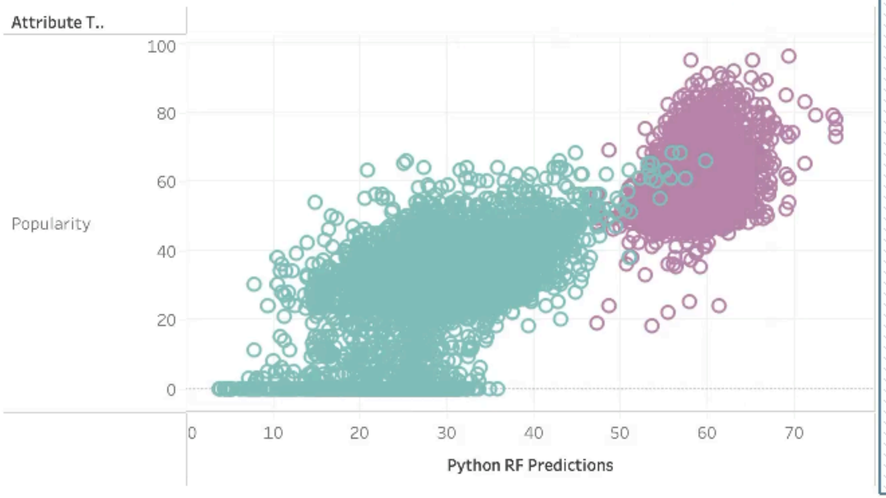
Music Attribute Explorer



R RF Model



Python RF Model



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Music Genre

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Highlight Music Genre

Highlight Music Genre

Attribute One

Energy

Attribute Two

Popularity

Data Source | Scatter | R RF | Python RF | Music Explorer

James Blair

Use the right combination of tools for the job, and deliver a **symphony** of insight

Resources

- plumbertableau
- fastapitableau
- shinytableau
- Examples
- Talk repo

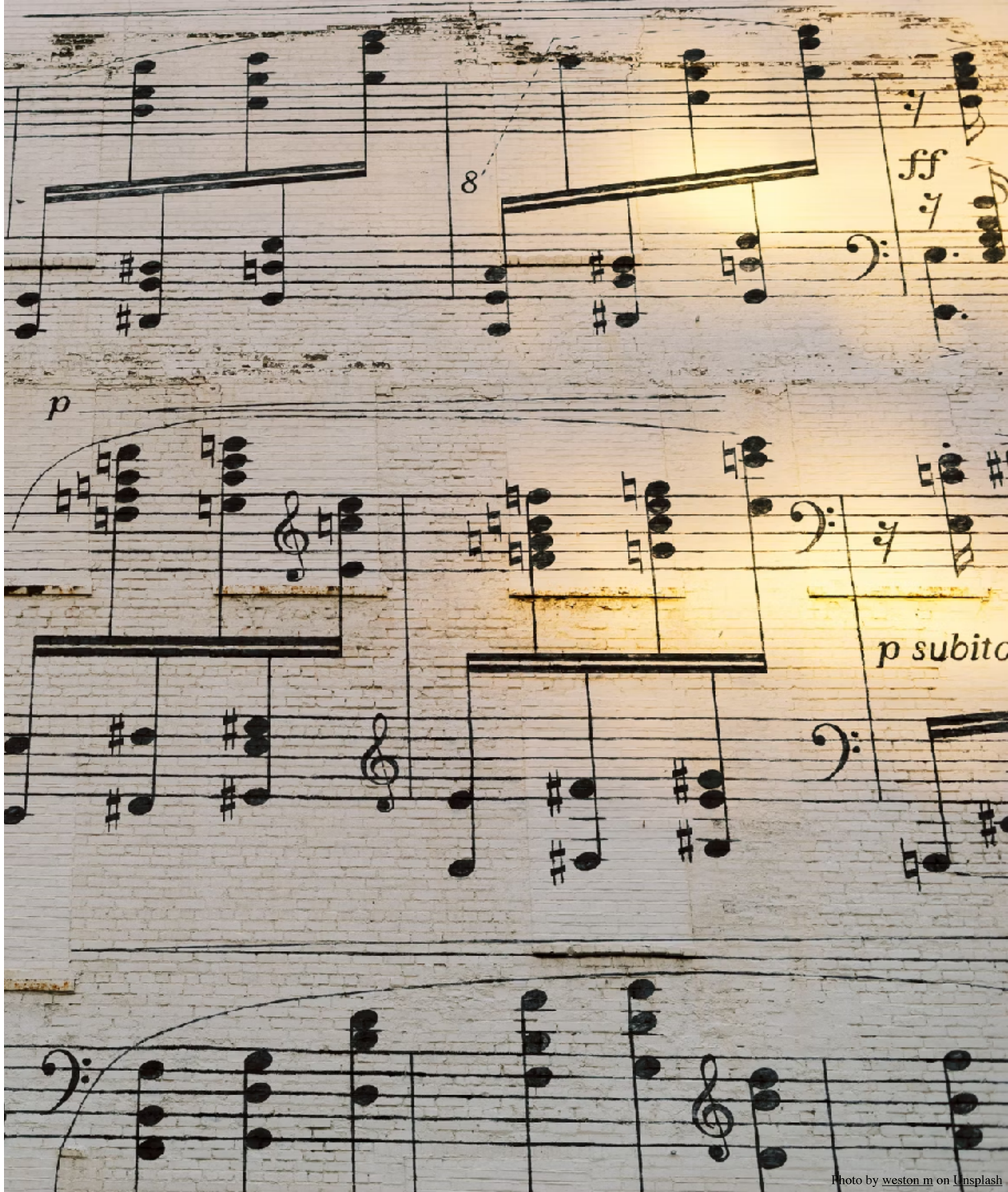

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Photo by Joah Legg on Unsplash