

# Visualización de Datos con Tableau

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UNIVERSIDAD  
DE GRANADA

# Organización

Sesiones

## Jueves 11 de marzo

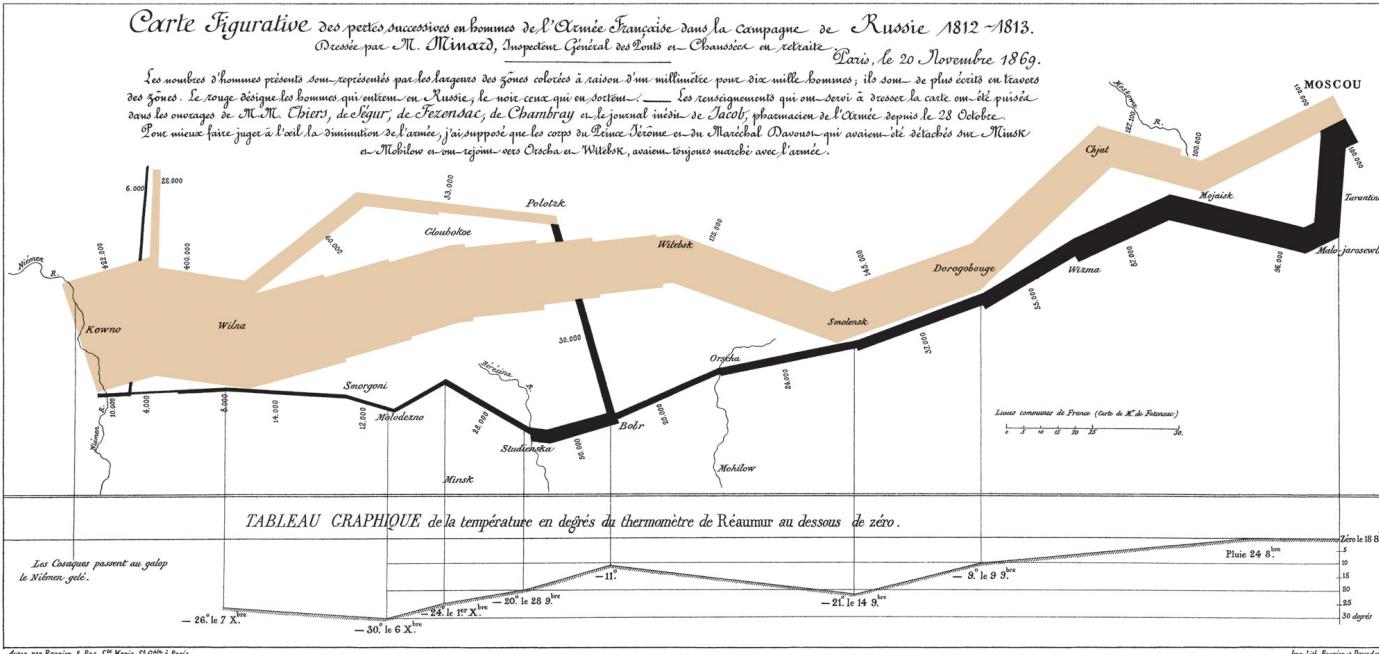
1. Introducción
  2. Preparación de datos
  3. Creación de gráficos
- 

## Viernes 12 de marzo

1. Creación de gráficos
2. Tendencias y predicciones
3. Mapas

# Visualización de datos

## Motivación



Charles Minard, *The march on Moscow*. 1869.

<https://www.tableau.com/learn/whitepapers/5-most-influential-visualizations>

# Tableau

Descripción

**Tableau** /ta-bló/ Herramienta interactiva para visualización de datos

**Tableau Desktop** Software de escritorio para creación de visualizaciones

<https://www.tableau.com/es-es/products/desktop>

PROBAR AHORA

<https://www.tableau.com/es-es/academic/students>

Tableau Reader Lector de visualizaciones realizadas con Tableau Desktop

Tableau Prep Software de escritorio para preprocesamiento de datos

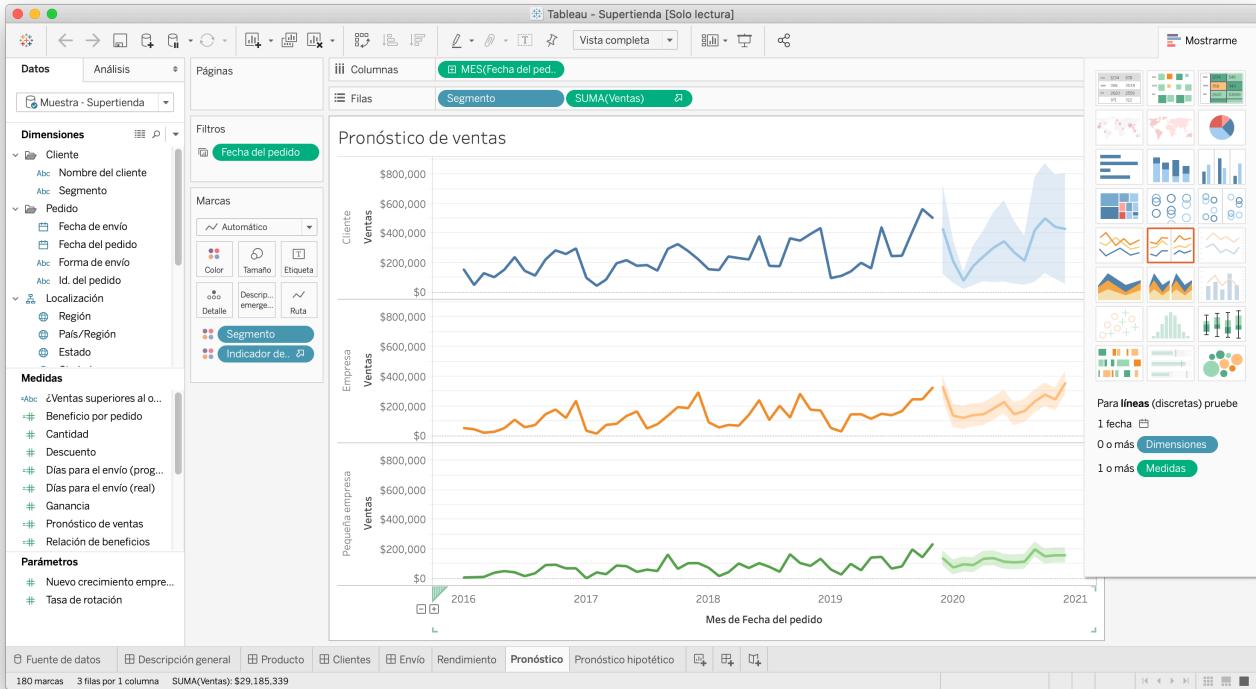
Tableau Online Versión web de Tableau

Tableau Server Servidor de visualizaciones para compartir visualizaciones y tableros de mando

# Tableau

Descripción

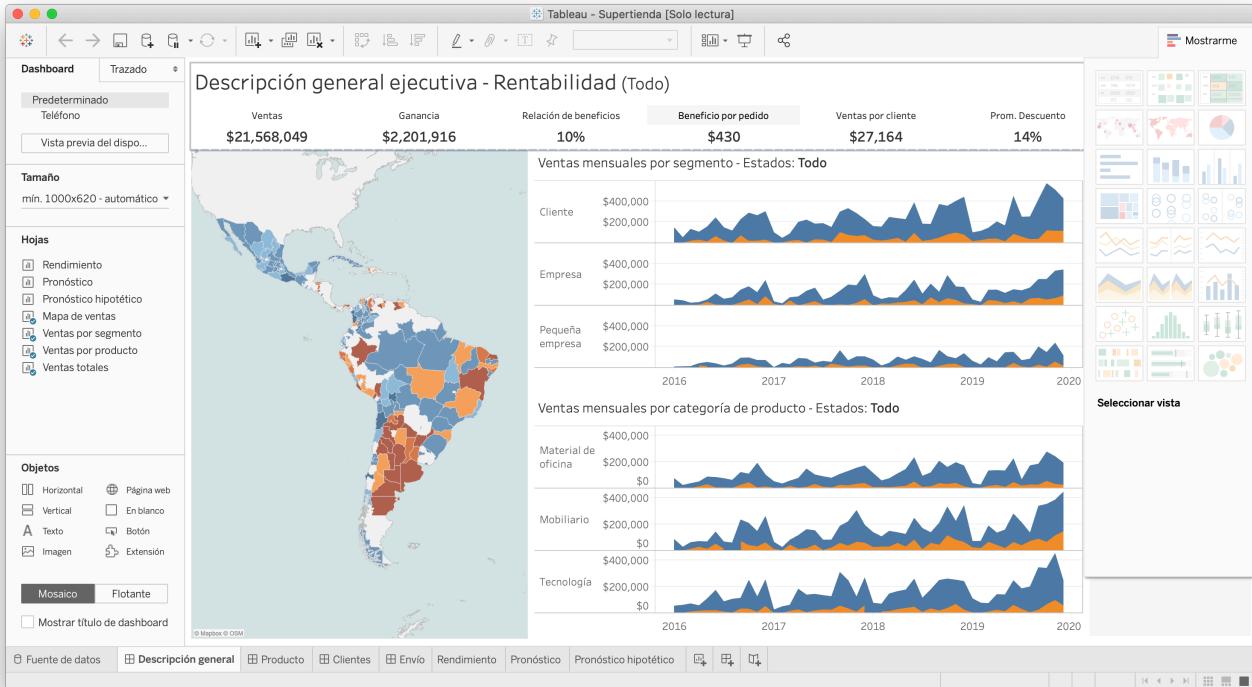
## Tableau 2020.4



# Tableau

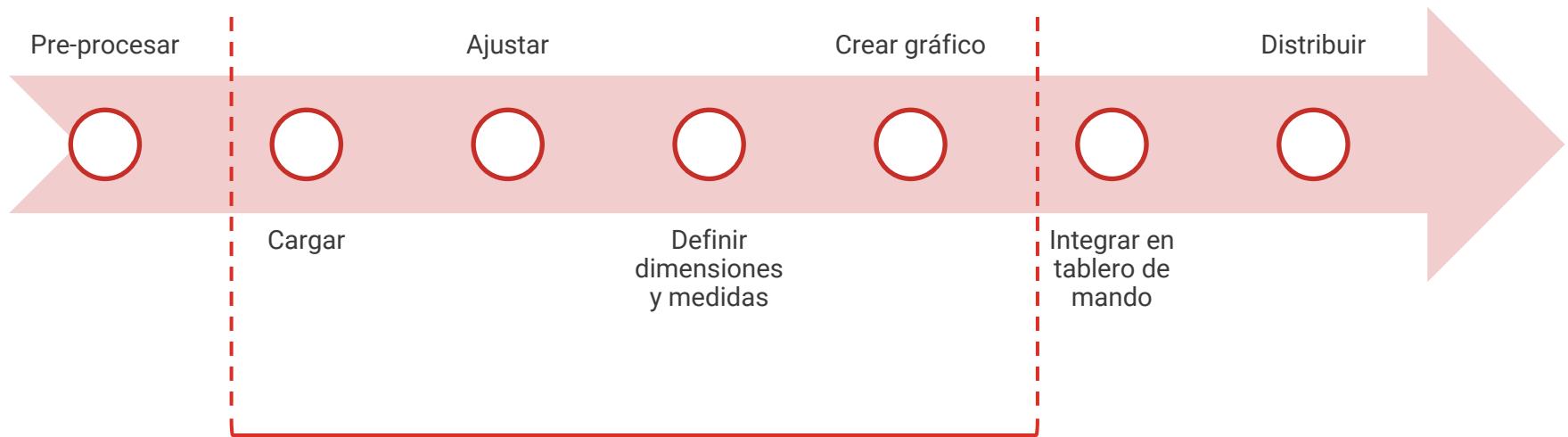
Descripción

## Tableau 2020.4



# Tableau

## Flujo de trabajo



# Tableau

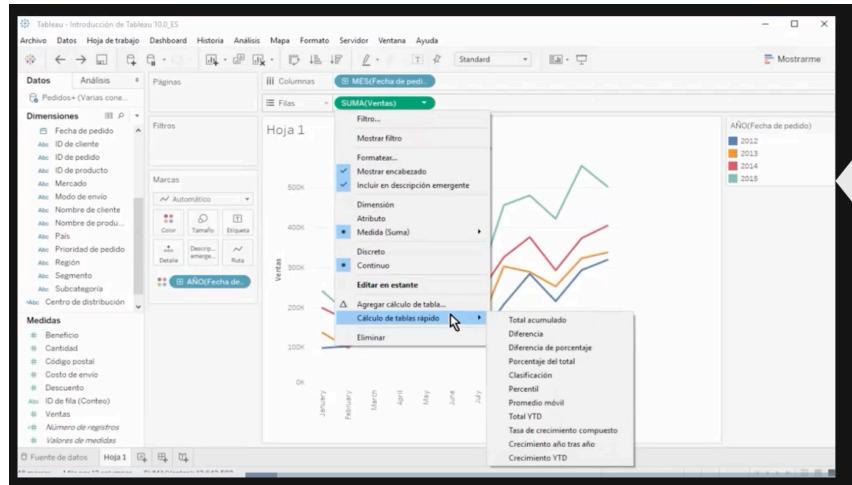
## Bibliografía

### Kits de inicio de Tableau

<https://www.tableau.com/es-es/learn/starter-kits>

### Recursos de aprendizaje de Tableau

<https://www.tableau.com/es-es/learn/training>



The screenshot shows the Tableau desktop application. On the left is the data source pane with dimensions like 'Pedidos' and measures like 'Ventas'. The main area displays a line chart of sales over time from January to June for five years (2012-2016). A context menu is open over one of the data points, with 'Cálculo de tablas rápidas...' highlighted. To the right is a learning platform interface with a sidebar for 'Introducción' and a list of video topics.

Tema	Duración
Introducción	27 MIN
La interfaz de Tableau	5 MIN
Distribución y publicación	4 MIN

# Tableau

## Bibliografía

Alexander Loth. **Visual Analytics with Tableau**. Wiley, 2019

<https://learning.oreilly.com/library/view/visual-analytics-with/9781119560203/>

Ryan Sleeper. **Innovative Tableau**. O'Reilly 2020.

<https://learning.oreilly.com/library/view/innovative-tableau/9781492075646/>

Lorna Brown. **Tableau Desktop 2020 Cookbook**. O'Reilly 2021.

<https://learning.oreilly.com/library/view/tableau-desktop-2020/9781492090106/>

Suk S. Brar. Visual Analytics with Tableau. Coursera 2021.

<https://www.coursera.org/learn/dataviz-visual-analytics>

Linda Ryan. **Visual Data Storytelling with Tableau**. Addison-Wesley Professional 2018.

<https://learning.oreilly.com/library/view/visual-data-storytelling/9780134712963/>

Nathan Yau. **Visualize this**. O'Reilly 2018.

<https://learning.oreilly.com/library/view/visualize-this-the/9781118140260/>

Cole Nussbaumer Knaflic. **Storytelling with Data: A Data Visualization Guide for Business Professionals**. Wiley 2019.

<https://learning.oreilly.com/library/view/storytelling-with-data/9781119621492/>

# Tableau

Conjuntos de datos

## FIFA 2020

Características de jugadores de fútbol en el videojuego FIFA 2020

<https://www.kaggle.com/stefanoleone992/fifa-20-complete-player-dataset>

*Estudio de poblaciones de individuos*

## Portland

Registros de delitos en la ciudad de Portland en 1972-2018

<https://www.portlandoregon.gov/police/71978>

*Estudio de eventos geolocalizados*

**Descargar**

<https://github.com/jgromero/dataviz21>

# # FIFA 2020

EJERCICIO

# Tableau

Carga de datos

<https://www.kaggle.com/stefanoleone992/fifa-20-complete-player-dataset>

SQFIFA

PLAYERS TEAMS SQUADS SHORTLISTS DISCUSSIONS

SIGN IN    

Players

FIFA 21 ✓ MAR 6, 2021 ✓

Creative Cloud

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Actualizar ahora

All Added Updated Free On Loan Removed Customized Create Player Calculator

Search Player ...

COLUMNS SELECTED

- Age X Overall Rating X
- Potential X Value X
- Wage X Total Stats X

Add Column

NAME AGE OVA POT TEAM & CONTRACT ↓VALUE WAGE TOTAL ... HITS

NAME	AGE	OVA	POT	TEAM & CONTRACT	↓VALUE	WAGE	TOTAL ...	HITS
K. Mbappé ST LW RW	21	90	95	Paris Saint-Germain 2018 ~ 2022	€185.5M	€160K	2147	632
E. Haaland ST	19	86	93	Borussia Dortmund 2020 ~ 2024	€133.5M	€67K	2064	1.7K
Neymar Jr LW CAM	28	91	91	Paris Saint-Germain 2017 ~ 2022	€132M	€270K	2175	403
K. De Bruyne CM CAM	29	91	91	Manchester City 2015 ~ 2023	€127.5M	€370K	2303	233
R. Lewandowski ST	31	92	92	FC Bayern München 2014 ~ 2023	€124.5M	€270K	2211	434
H. Kane ST	26	89	90	Tottenham Hotspur 2010 ~ 2024	€123M	€230K	2204	494
Bruno Fernandes CAM	25	88	91	Manchester United 2020 ~ 2025	€121M	€240K	2348	701
M. Salah RW	28	90	90	Liverpool 2017 ~ 2023	€120.5M	€250K	2211	221

BASKET

COMPARE CLEAR

+ SHORTLIST + SQUAD

SEARCH

- All Players
- Continents
- Nationality / Region
- Leagues
- Teams

# Tableau

## Ajustar

Descargar: <https://github.com/jgromero/dataviz21>

Los nombres de campo están en la primera fila

Propiedades del archivo de texto > Separador de campos > Coma

fifa\_players\_20

fifa\_players\_20.csv

Necesita más datos?

Arrastra tablas para establecer relaciones entre ellas. [Más información](#)

#	fifa_players_20_id	fifa_players_20_csv_player_url	Abc	fifa_players_20_csv_short_name	Abc	fifa_players_20_csv_long_name	#	fifa_players_20_id	Abc	fifa_players_20_csv_dob	Abc	fifa_players_20_csv_height_cm	#	fifa_players_20_id	Abc	fifa_players_20_csv_weight_kg	Abc	fifa_players_20_csv_nationality	Abc	fifa_players_20_csv_club
158.023	https://sofifa.com/pl...	L. Messi	Lionel Andrés Messi ...	32	24/6/1987	170	72	Argentina	FC Barcelona											
20.801	https://sofifa.com/pl...	Cristiano Ronaldo	Cristiano Ronaldo do...	34	5/2/1985	187	83	Portugal	Juventus											
190.871	https://sofifa.com/pl...	Neymar Jr	Neymar da Silva Sant...	27	5/2/1992	175	68	Brazil	Paris Saint-Germain											
200.389	https://sofifa.com/pl...	J. Oblak	Jan Oblak	26	7/1/1993	188	87	Slovenia	Atlético Madrid											
183.277	https://sofifa.com/pl...	E. Hazard	Eden Hazard	28	7/1/1991	175	74	Belgium	Real Madrid											
192.985	https://sofifa.com/pl...	K. De Bruyne	Kevin De Bruyne	28	28/6/1991	181	70	Belgium	Manchester City											
192.448	https://sofifa.com/pl...	M. ter Stegen	Marc-André ter Stegen	27	30/4/1992	187	85	Germany	FC Barcelona											
203.376	https://sofifa.com/pl...	V. van Dijk	Virgil van Dijk	27	8/7/1991	193	92	Netherlands	Liverpool											
177.003	https://sofifa.com/pl...	L. Modrić	Luka Modrić	33	9/9/1985	172	66	Croatia	Real Madrid											
209.331	https://sofifa.com/pl...	M. Salah	Mohamed Salah Ghaly	27	15/6/1992	175	71	Egypt	Liverpool											
231.747	https://sofifa.com/pl...	K. Mbappé	Kylian Mbappé	20	20/12/1998	178	73	France	Paris Saint-Germain											
201.024	https://sofifa.com/pl...	K. Koulibaly	Kalidou Koulibaly	28	20/6/1991	187	89	Senegal	Napoli											
202.126	https://sofifa.com/pl...	H. Kane	Harry Kane	25	28/7/1993	188	89	England	Tottenham Hotspur											
212.831	https://sofifa.com/pl...	A. Becker	Alisson Ramses Becker	26	2/10/1992	191	91	Brazil	Liverpool											

# Tableau

Crear un gráfico

Dimensiones

Opciones

Filas / Columnas

Gráfico

Medidas

Formato de marcas

Lienzo

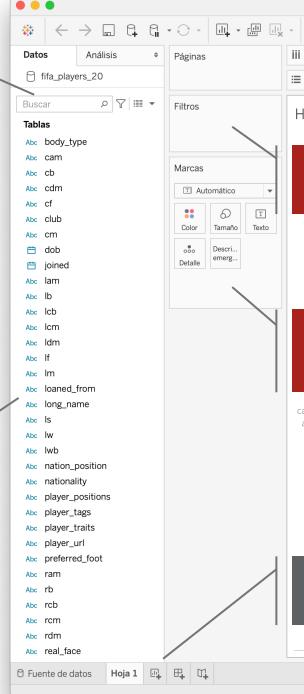
Hojas

Hoja 1

Soltar un campo aquí

Soltar un campo aquí

Soltar un campo aquí



# Tableau

Definir dimensiones y medidas

## Hecho

Elemento importante que se pretende analizar.

Ejemplo: futbolistas.

## Dimensiones

Propiedades de los hechos que determinan el análisis.

*Las dimensiones contienen valores cualitativos (por ejemplo, nombres, fechas o datos geográficos). Puede utilizar las dimensiones para categorizar, segmentar y revelar los detalles de los datos. Las dimensiones afectan al nivel de detalle de la vista.*

Ejemplo: *body\_type, club, team\_position*, etc.

## Medidas

Valoración numérica acerca del hecho que nos va a servir para analizarlo.

*Las medidas contienen valores numéricos cuantitativos que se pueden medir. Las medidas se pueden agregar. Al arrastrar una medida a la vista, Tableau aplica una agregación a esa medida (de forma predeterminada).*

Ejemplo: *age, overall, wage\_eur*, etc.

# Tableau

## Tablas de datos

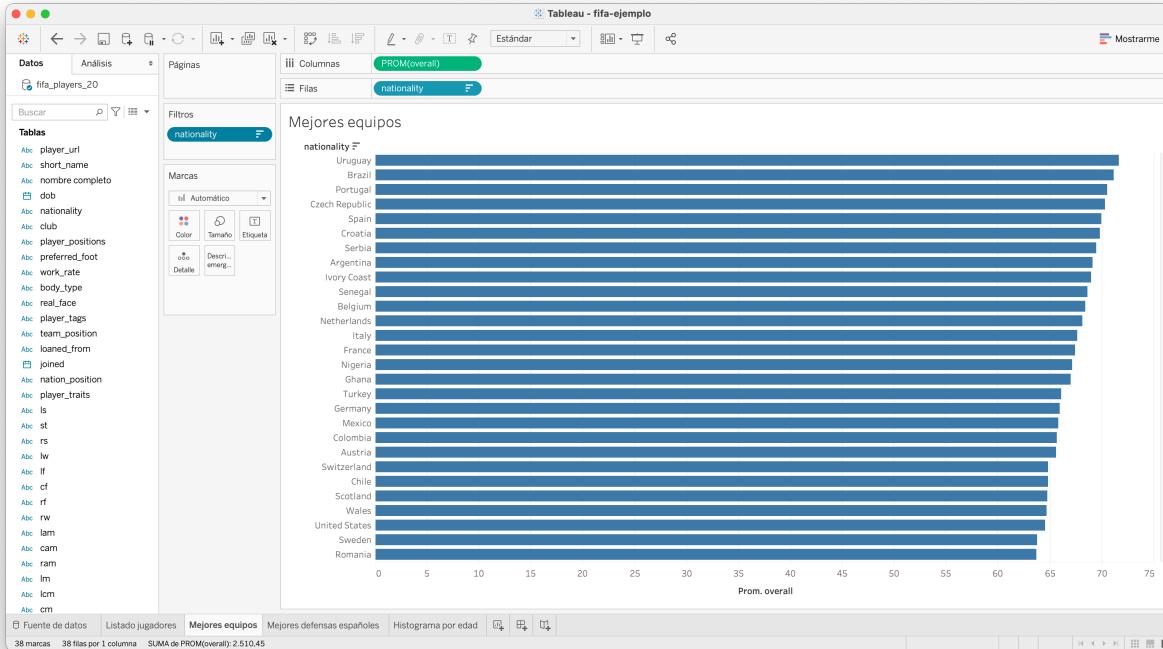
The screenshot shows the Tableau interface with the following details:

- Top Bar:** Includes standard Mac OS X window controls (red, yellow, green buttons), a title bar "Tableau - fifa-ejemplo", and a toolbar with various icons.
- Left Panel:** A sidebar titled "Datos" containing a tree view of data sources:
  - fifa\_players\_20
  - Tables
    - Abc ram
    - Abc lm
    - Abc lcm
    - Abc cm
    - Abc rcm
    - Abc rm
    - Abc lwb
    - Abc idm
    - Abc cdm
    - Abc rdm
    - Abc rwb
    - Abc lb
    - Abc lcb
    - Abc cb
    - Abc rcb
    - Abc rb
  - Nombres de medidas
    - # sofifa\_id
    - # age
    - # height\_cm
    - # weight\_kg
    - # overall
    - # potential
    - # value\_eur
    - # wage\_eur
    - # international\_reputation
    - # weak\_foot
    - # skill\_moves
    - # release\_clause\_eur
    - # team\_jersey\_number
    - # contract\_valid\_until
    - # nation\_jersey\_number
    - # pace
    - # shooting
- Center Panel:** A data grid titled "Mejores jugadores (>=85)" showing the following data:

nombre completo	nationality	overall	ABC
Lionel Andrés Messi Cuccittini	Argentina	94	Abc
Cristiano Ronaldo dos Santos Aveiro	Portugal	93	Abc
Neymar da Silva Santos Júnior	Brazil	92	Abc
Eden Hazard	Belgium	91	Abc
Jan Oblak	Slovenia	91	Abc
Kevin De Bruyne	Belgium	91	Abc
Luka Modrić	Croatia	90	Abc
Marc-André ter Stegen	Germany	90	Abc
Mohamed Salah Ghaly	Egypt	90	Abc
Virgil van Dijk	Netherlands	90	Abc
Allison Ramzes Becker	Brazil	89	Abc
Antoine Griezmann	France	89	Abc
David De Gea Quintana	Spain	89	Abc
Giorgio Chiellini	Italy	89	Abc
Harry Kane	England	89	Abc
Kalidou Koulibaly	Senegal	89	Abc
Kylian Mbappé Lottin	France	89	Abc
Luis Alberto Suárez Díaz	Uruguay	89	Abc
N'Golo Kanté	France	89	Abc
Robert Lewandowski	Poland	89	Abc
Sergio Busquets i Burgos	Spain	89	Abc
Sergio Leonel Agüero del Amor	Argentina	89	Abc
Sergio Ramos García	Spain	89	Abc
Christina Dannemann Erlingsson	Denmark	88	Abc
David José Jiménez Silva	Spain	88	Abc
Diego Godín	Uruguay	88	Abc
Ederson Santana de Moraes	Brazil	88	Abc
Edinson Roberto Cavani González	Uruguay	88	Abc
Gerard Piqué Bernabéu	Spain	88	Abc
Hugo Lloris	France	88	Abc
Manuel Neuer	Germany	88	Abc
Marco Reus	Germany	88	Abc
Paul Pogba	France	88	Abc
Paulo Bruno Exequiel Dybala	Argentina	88	Abc
- Right Panel:** A shelf titled "Mostrar me" containing various visualization options like maps, charts, and tables.
- Bottom Status Bar:** Shows "108 marcas" and "SUMA de PROM(overall): 9.393.000".

# Tableau

## Agregaciones



# Tableau

Crear gráfico

## Barras

Representación gráfica de una variable en forma de barras, donde la superficie de cada barra es proporcional al valor de los valores representados. Suelen utilizarse para comparar valores de una misma variable.

Ejemplo: nombre de jugador y puntuación

## Histograma

Representación gráfica de una variable en forma de barras, donde la longitud de cada barra es proporcional a la frecuencia de los valores representados.

Ejemplo: representar cuántos futbolistas hay para cada tramo de edad

## Dispersión

Representación gráfica de una variable frente a otra, cada una en un eje diferente.

Ejemplo: puntuación general vs edad

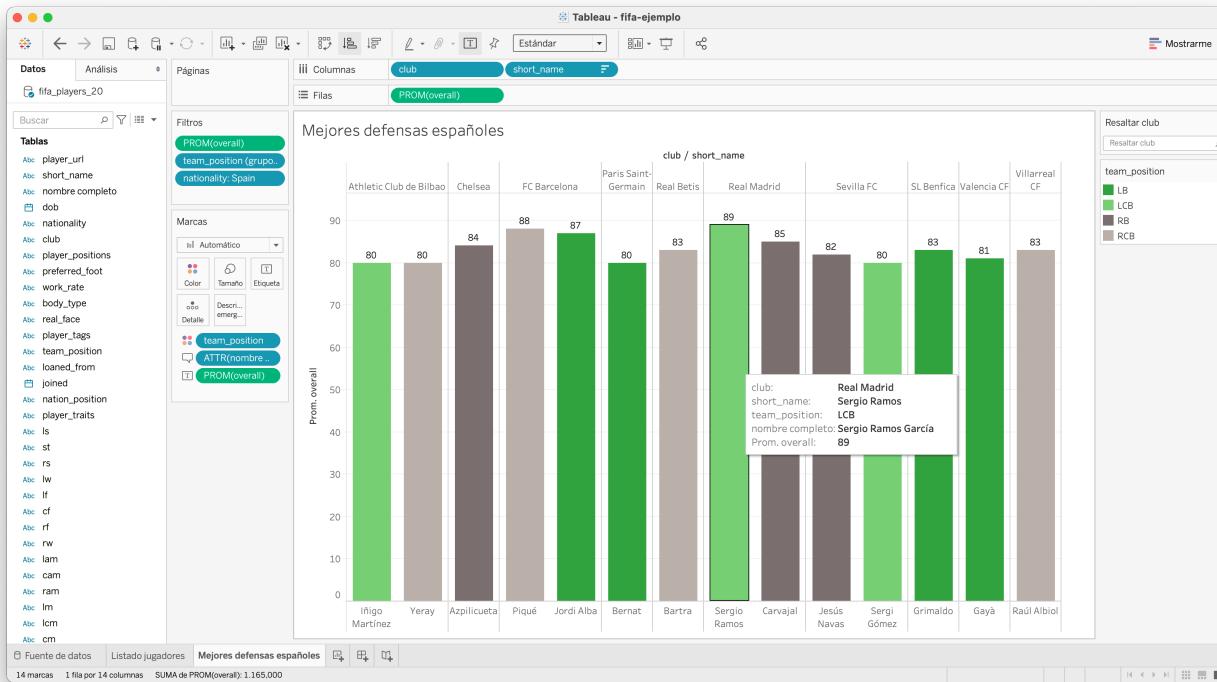
## Bigotes

Elemento importante dentro del modelo de empresa que se pretende analizar: ventas, pedidos, trabajadores, etc.

Ejemplo: futbolistas

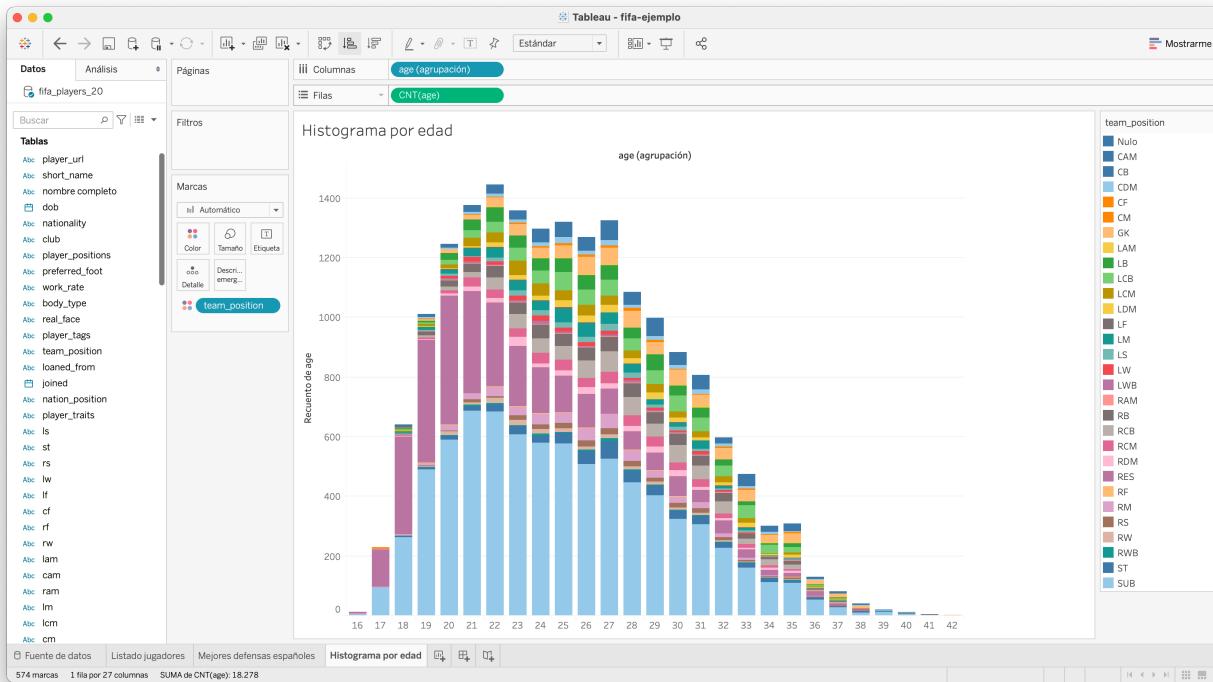
# Tableau

## Diagrama de barras



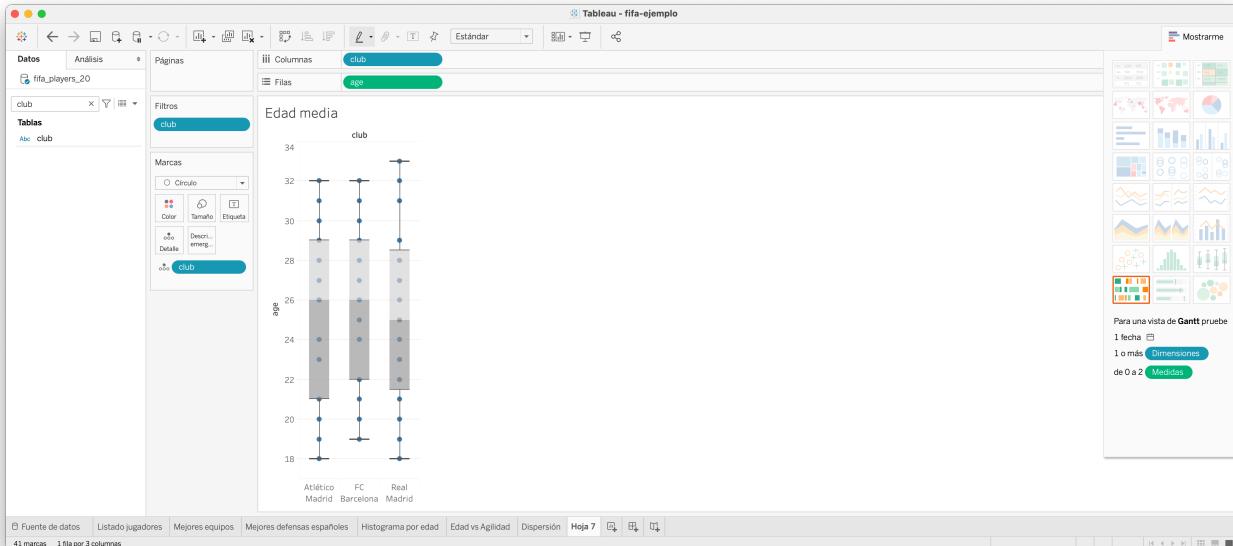
# Tableau

## Histograma



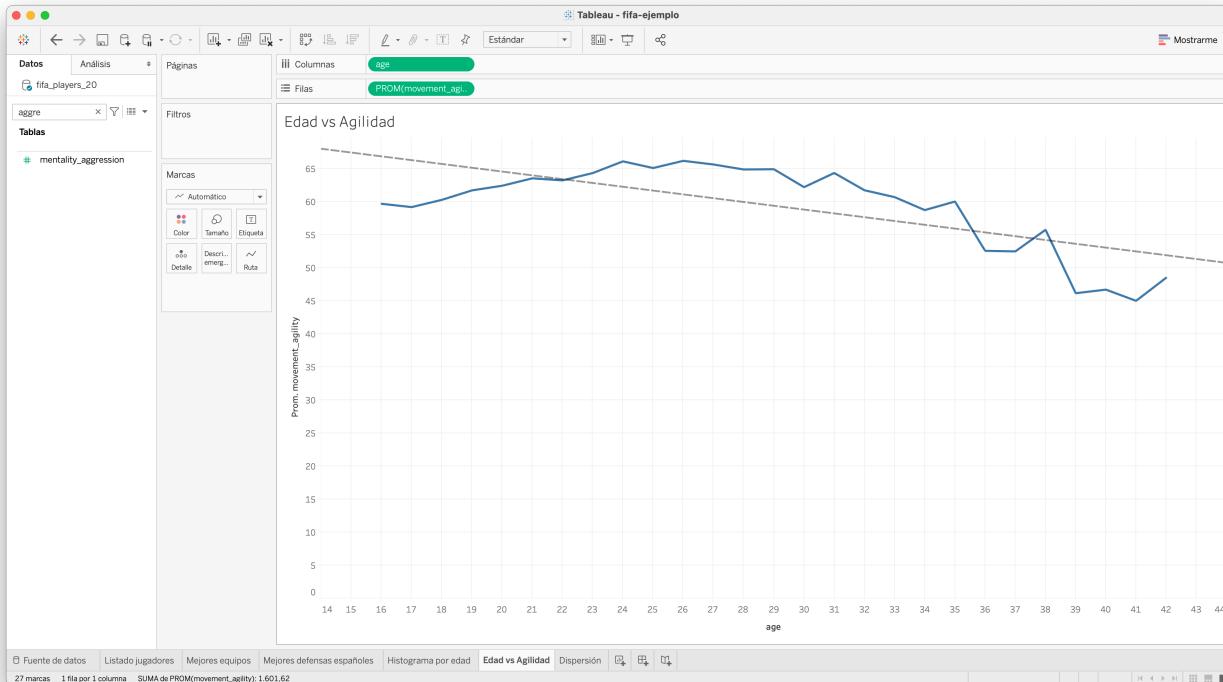
# Tableau

## Cajas y bigotes



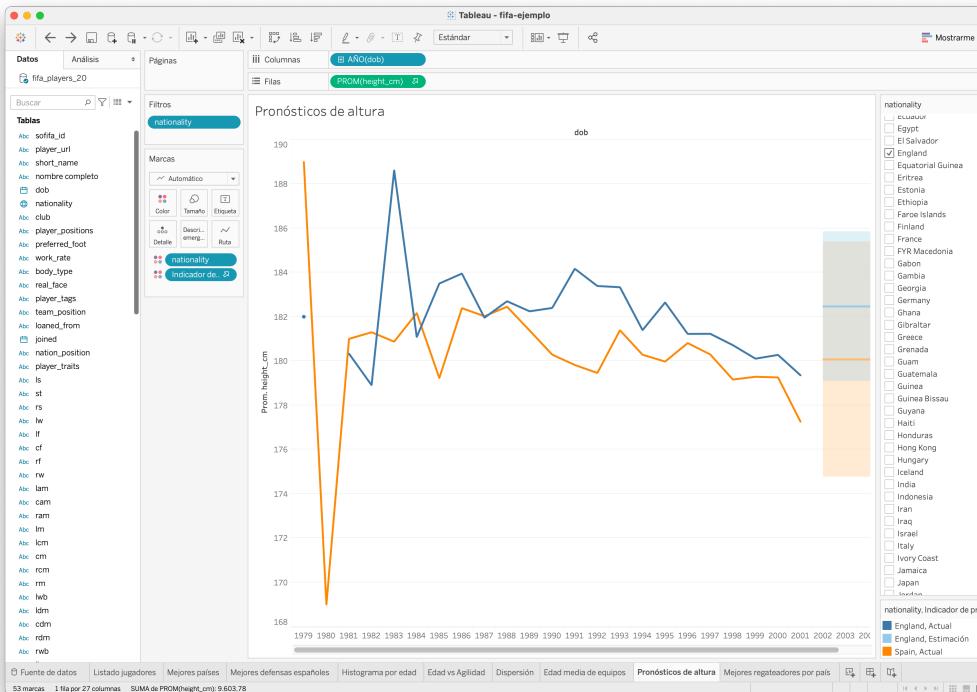
# Tableau

## Comparación de variables



# Tableau

## Comparación de variables



# Tableau

Dispersión + Líneas de tendencia



# Tableau

Ajustar

Tableau -- LibreOffice

Conexión: fifa\_players\_20

Filtros: 0 / Actualizar

Archivos: fifa\_players\_20.csv

Necesita más datos?

Ampliar tablas para establecer relaciones entre ellos. [Más información](#)

Nueva unión

Ordenar campos Orden de fuente de datos

Mositar filas Modificar filas Modificar campos resultantes 1.000 + Filas

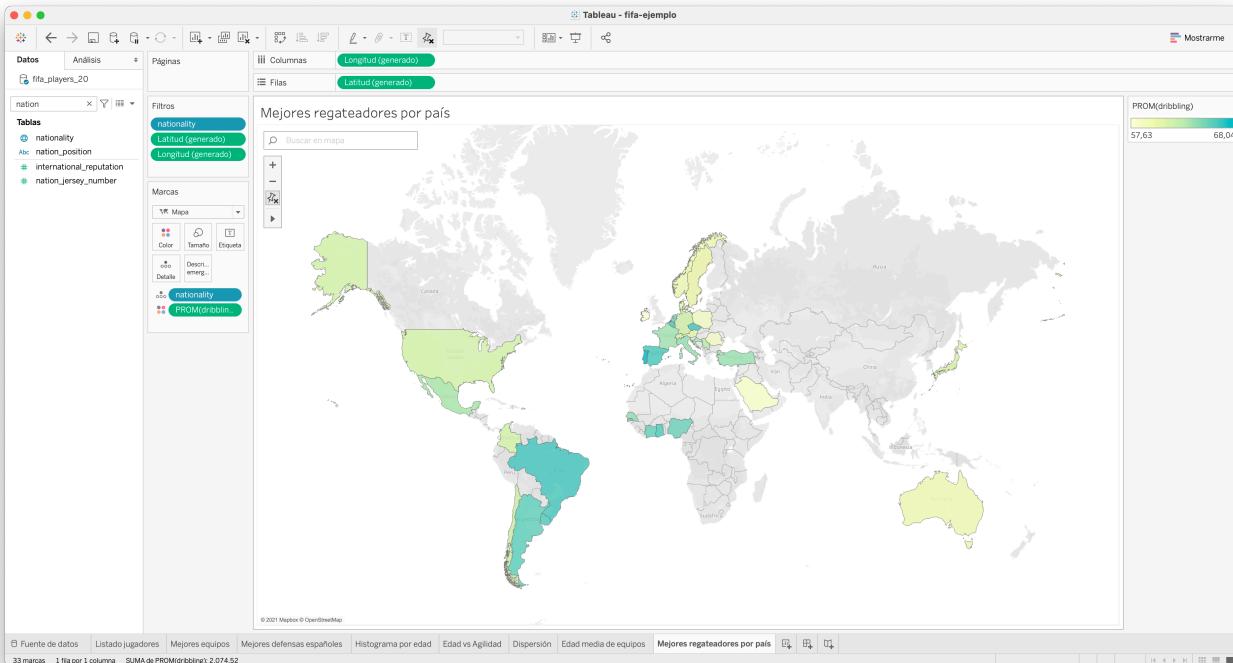
fifa_players_20_id	fifa_players_20_name	fifa_players_20_short_name	fifa_players_20_long_name	fifa_players_20_age	fifa_players_20_height_cm	fifa_players_20_weight_kg	fifa_players_20_nationality	fifa_players_20_club
188529	<a href="https://enfifa.com/jp...">https://enfifa.com/jp...</a>	L. Messi	Lionel Andrés Messi ...	32	186/198	70	Argentina	FC Barcelona
25461	<a href="https://enfifa.com/jp...">https://enfifa.com/jp...</a>	Cristiano Ronaldo	Cristiano Ronaldo da... Silva	34	182/198	83	Portugal	Asentus
190571	<a href="https://enfifa.com/jp...">https://enfifa.com/jp...</a>	Neymar Jr	Neymar da Silva Sant... Neto	27	175/198	75	Brazil	Paris Saint-Germain
200389	<a href="https://enfifa.com/jp...">https://enfifa.com/jp...</a>	J. Obiakor	Jan Obiakor	26	172/198	87	Slovenia	Atletico Madrid
188277	<a href="https://enfifa.com/jp...">https://enfifa.com/jp...</a>	E. Hazard	Eden Hazard	28	175/198	74	Belgium	Real Madrid
182385	<a href="https://enfifa.com/jp...">https://enfifa.com/jp...</a>	K. De Bruyne	Kevin De Bruyne	28	186/198	86	Belgium	Manchester City
182448	<a href="https://enfifa.com/jp...">https://enfifa.com/jp...</a>	M. ter Stegen	Marc André ter Stegen	27	180/198	85	Germany	FC Barcelona
203376	<a href="https://enfifa.com/jp...">https://enfifa.com/jp...</a>	V. van Dijk	Virgil van Dijk	27	187/198	92	Netherlands	Liverpool
177108	<a href="https://enfifa.com/jp...">https://enfifa.com/jp...</a>	L. Modric	Luka Modrić	30	186/198	86	Croatia	Real Madrid
209331	<a href="https://enfifa.com/jp...">https://enfifa.com/jp...</a>	M. Salah	Mohamed Salah (Gra... tayeb)	27	186/198	71	Egypt	Liverpool
191147	<a href="https://enfifa.com/jp...">https://enfifa.com/jp...</a>	K. Mbappé	Kylian Mbappé Lott... z	29	185/198	73	France	Paris Saint-Germain
201104	<a href="https://enfifa.com/jp...">https://enfifa.com/jp...</a>	H. Koulibaly	Kalidou Koulibaly	28	185/198	89	Senegal	Napoli
202126	<a href="https://enfifa.com/jp...">https://enfifa.com/jp...</a>	H. Kane	Harry Kane	25	186/198	88	England	Tottenham Hotspur
212431	<a href="https://enfifa.com/jp...">https://enfifa.com/jp...</a>	A. Icardi	Mauro Icardi	26	186/198	81	Italy	Liverpool

Fuente de datos: [Hoja 1](#) [Hoja 2](#) [Hoja 3](#) [Hoja 4](#)

Función geográfica >  
País / Región

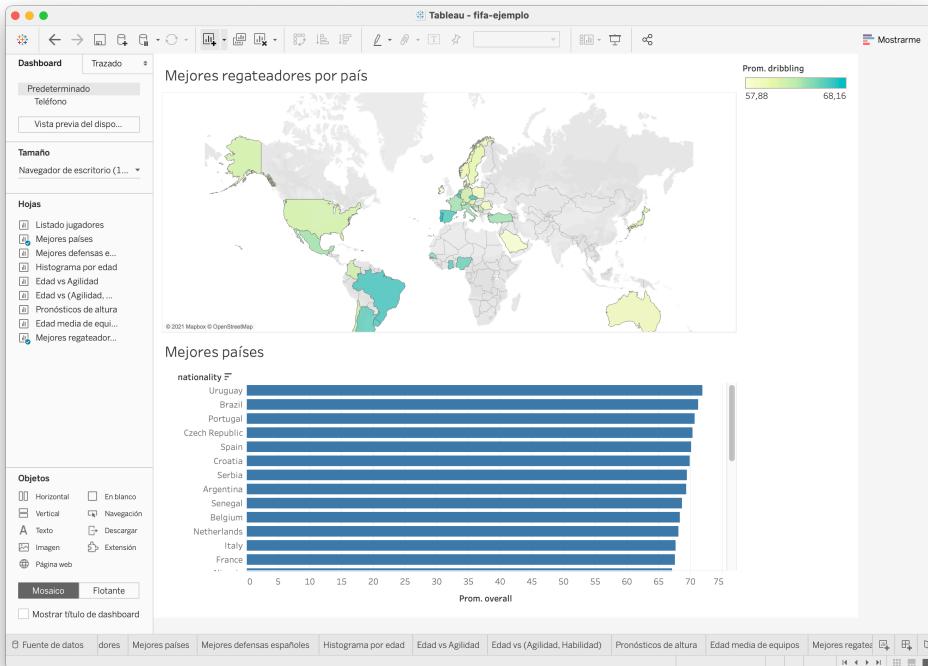
# Tableau

## Mapa



# Tableau

## Dashboard

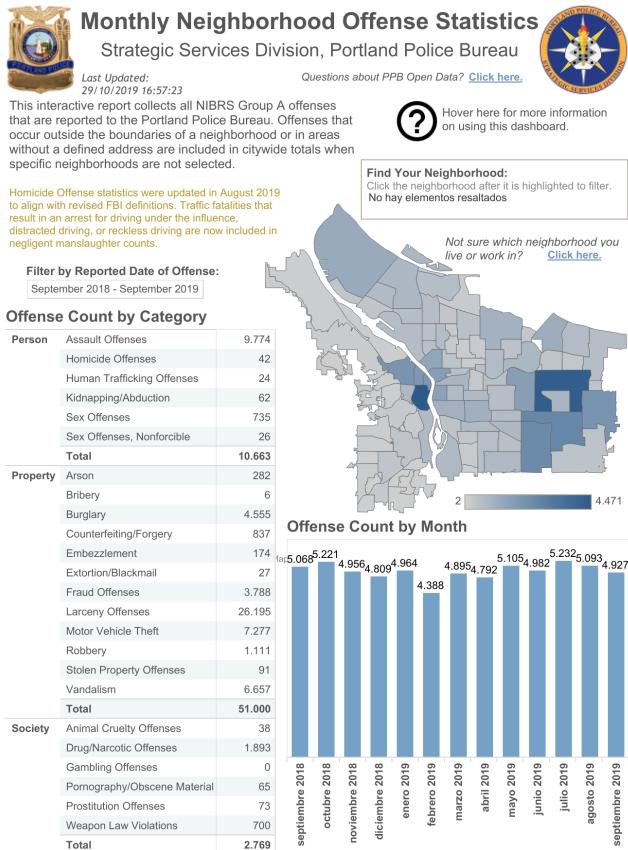


# # PORTLAND

EJERCICIO

# Tableau

Dataset *portland\_1972-2018*



Portland Police Bureau, *Monthly neighborhood offense Statistics*. 2019.

<https://www.portlandoregon.gov/police/71978>

# Tableau

Dataset *portland\_1972-2018*

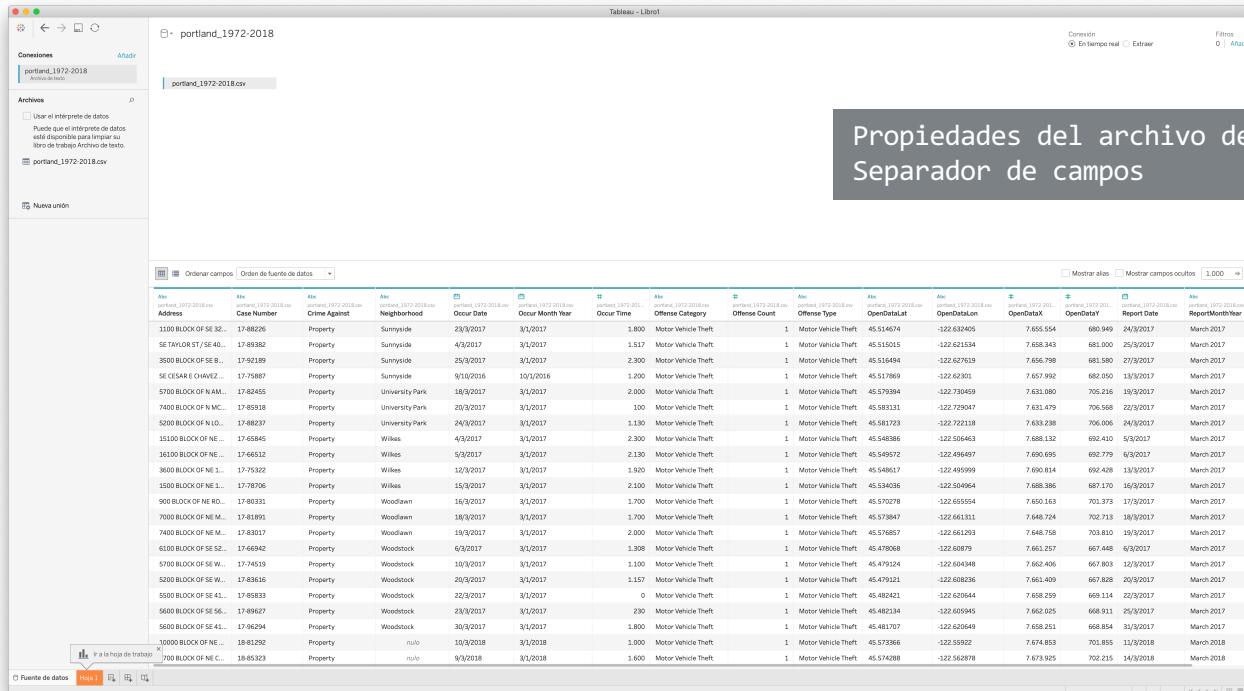
<https://www.kaggle.com/katzwigmore/portland-oregon-crime-data/data>

* Case Number	The case year and number for the reported incident (YY-#####). Sensitive cases have been randomly assigned a case number and are denoted by an X following the case year (YY-X#####).
Occur Month Year	The Month and Year that the incident occurred.
* Occur Date	Date the incident occurred. The exact occur date is sometimes unknown. In most situations, the first possible date the crime could have occurred is used as the occur date. (For example, victims return home from a week-long vacation to find their home burglarized. The burglary could have occurred at any point during the week. The first date of their vacation would be listed as the occur date.)
Occur Time	Time the incident occurred. The exact occur time is sometimes unknown. In most situations, the first possible time the crime could have occurred is used as the occur time. The time is reported in the 24-hour clock format, with the first two digits representing hour (ranges from 00 to 23) and the second two digits representing minutes (ranges from 00 to 59).
* Address	Address of reported incident at the 100-block level (e.g.: 1111 SW 2nd Ave would be 1000 Block SW 2nd Ave). To protect the identity of victims and other privacy concerns, the address location of certain case types are not released.
Open Data X / Y	Generalized XY point of the reported incident. For offenses that occurred at a specific address, the point is mapped to the block's midpoint. Offenses that occurred at an intersection is mapped to the intersection centroid. To protect the identity of victims and other privacy concerns, the points of certain case types are not released. XY points use the Oregon State Plane North (3601), NAD83 HARN, US International Feet coordinate system.
* Open Data Lat / Lon	Generalized Latitude / Longitude of the reported incident. For offenses that occurred at a specific address, the point is mapped to the block's midpoint. Offenses that occurred at an intersection is mapped to the intersection centroid. To protect the identity of victims and other privacy concerns, the points of certain case types are not released.
* Neighborhood	Neighborhood where incident occurred. If the neighborhood name is missing, the incident occurred outside of the boundaries of the Portland neighborhoods or at a location that could not be assigned to a specific address in the system (e.g., Portland, near Washington Park, on the streetcar, etc.). Note: Neighborhood boundaries and designations vary slightly from those found on the Office of Neighborhood Involvement website.
* Crime Against	Crime against category (Person, Property, or Society)
* Offense Category	Category of offense (for example, Assault Offenses)
	Type of offense (for example, Aggravated Assault)
* Offense Type	Note: The statistic for Homicide Offenses has been updated in the Group A Crimes report to align with the 2019 FBI NIBRS definitions. The statistic for Homicide Offenses includes (09A) Murder & Non-negligent Manslaughter and (09B) Negligent Manslaughter. As of January 1, 2019, the FBI expanded the definition of negligent manslaughter to include traffic fatalities that result in an arrest for driving under the influence, distracted driving, or reckless driving. The change in definition impacts the 2019 homicide offenses statistic and the comparability of 2019 homicide statistics to prior year.
Offense Count	Number of offenses per incident. Offenses (i.e. this field) are summed for counting purposes.

# Tableau

## Carga de datos

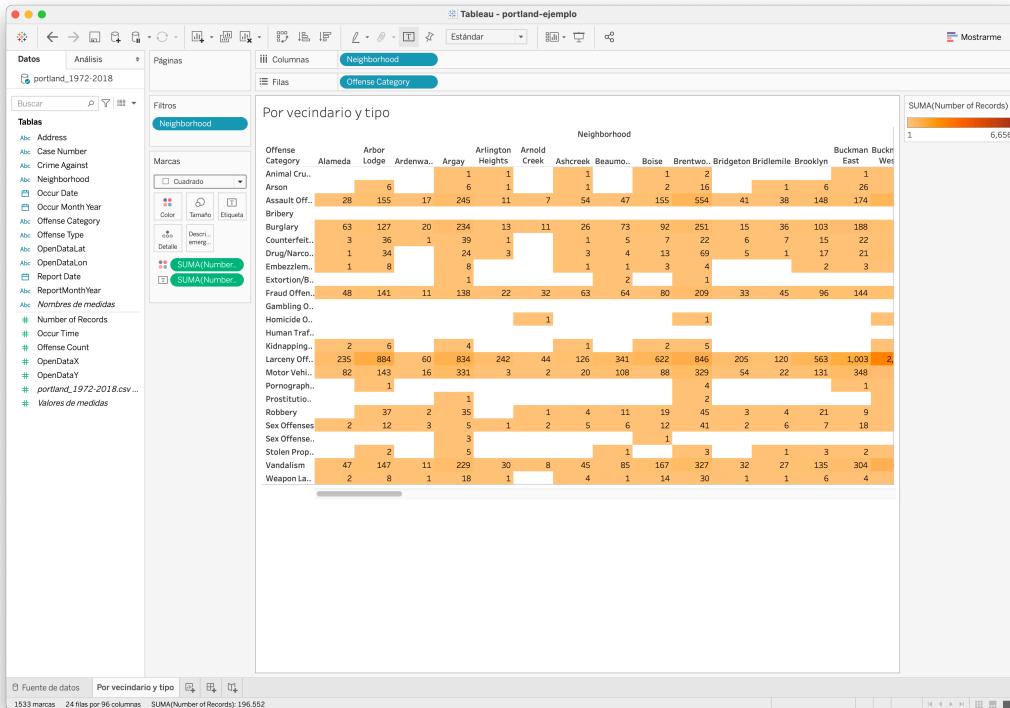
**Descargar:** <https://github.com/jgromero/dataviz21>



## Propiedades del archivo de texto > Separador de campos

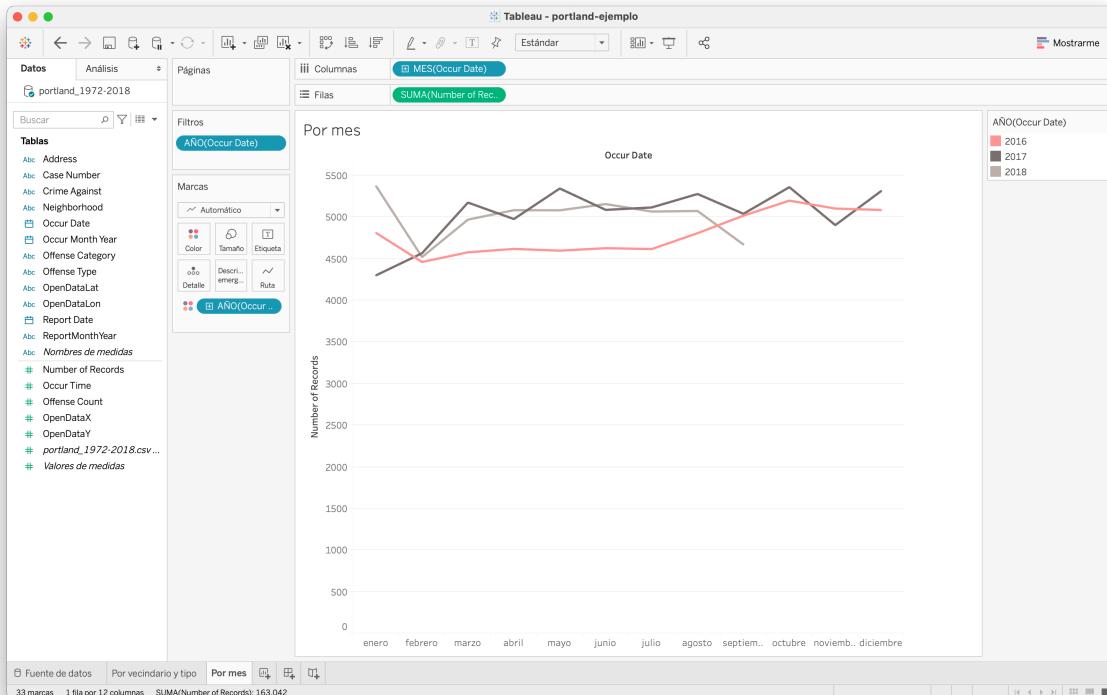
# Tableau

## Tabla



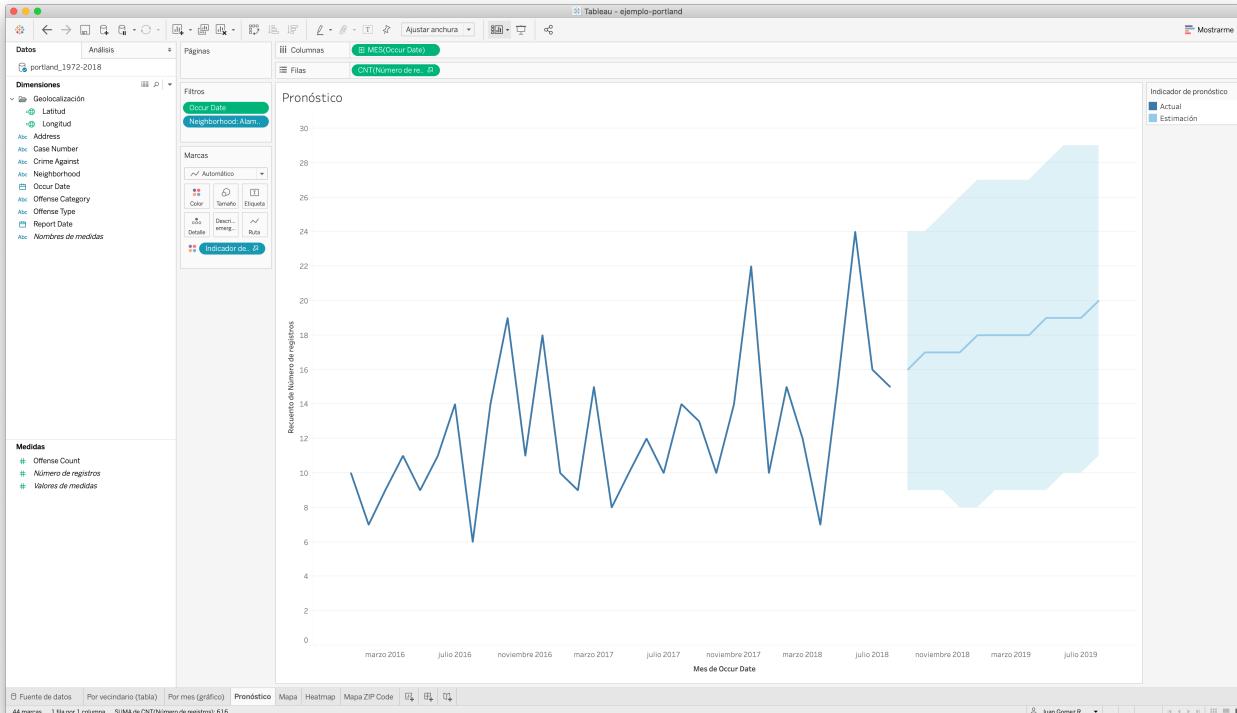
# Tableau

## Líneas



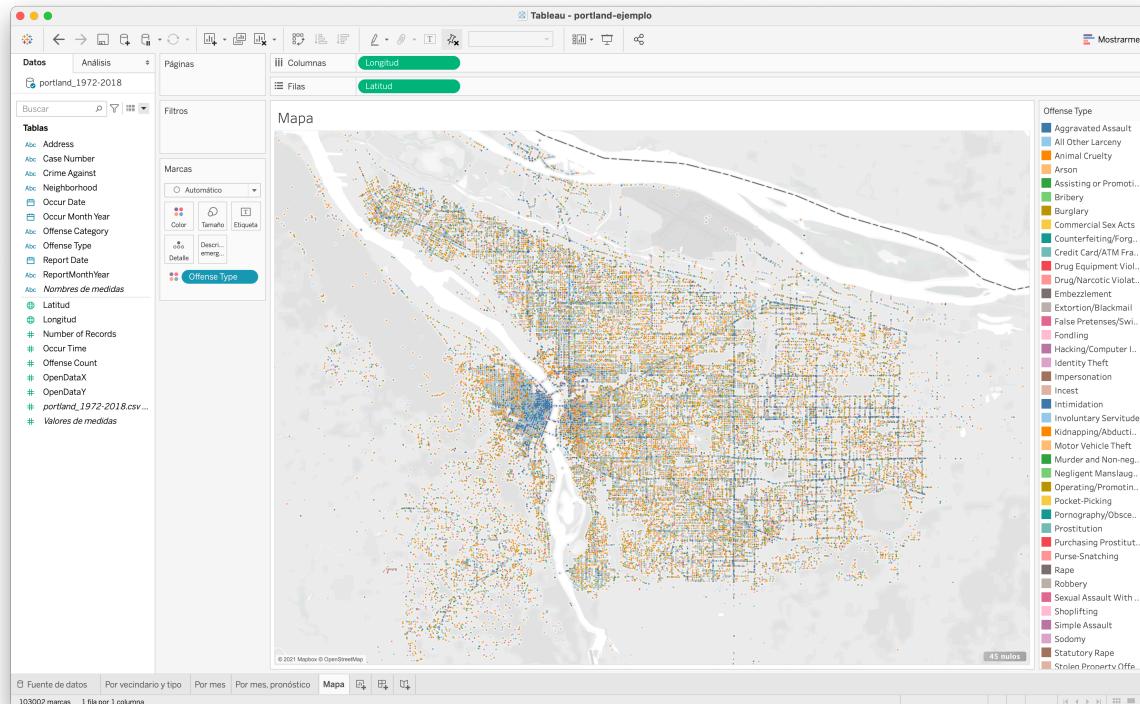
# Tableau

## Pronóstico



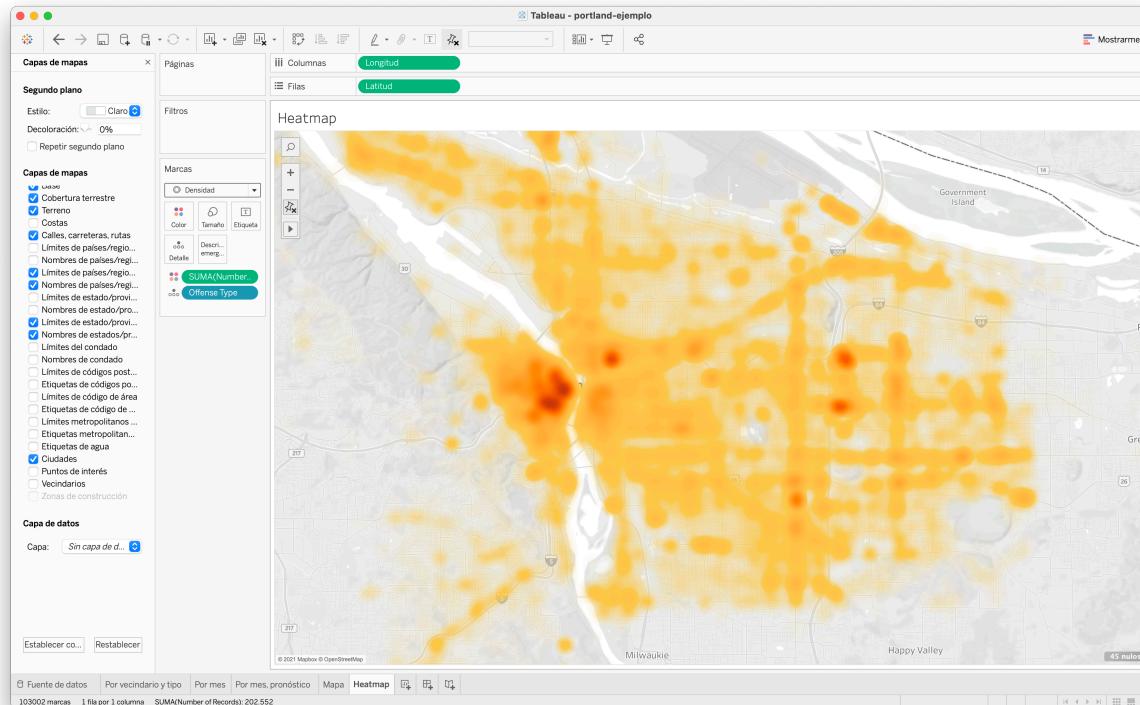
# Tableau

## Mapa



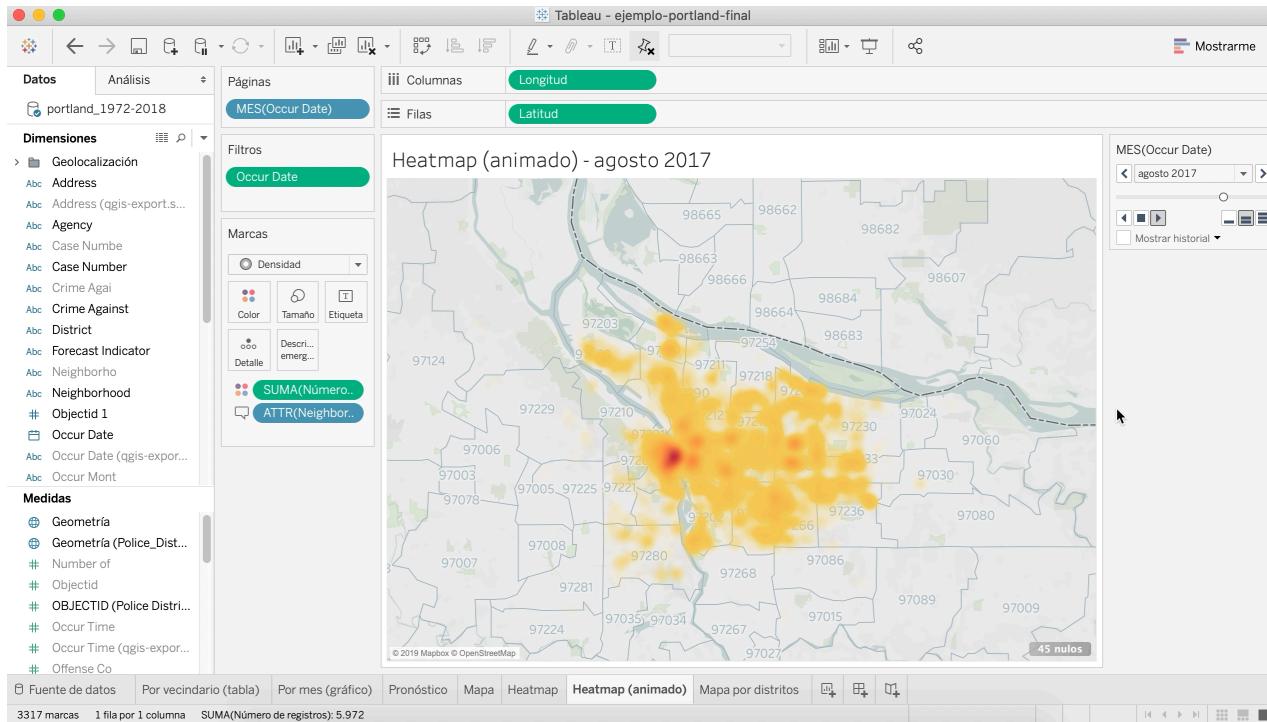
# Tableau

## Heatmap



# Tableau

## Heatmap animado



# Tableau

Funciones avanzadas de mapas

## Geolocalización personalizada

*La geocodificación personalizada significa que asigna coordenadas de latitud y longitud a sus ubicaciones para que Tableau pueda trazarlas de forma precisa.*

[https://help.tableau.com/v2020.4/pro/desktop/es-es/custom\\_geocoding.htm](https://help.tableau.com/v2020.4/pro/desktop/es-es/custom_geocoding.htm)

## Mapas a partir de archivos espaciales

*Tableau Desktop, puede conectarse a los siguientes tipos de archivos espaciales: archivos de forma, tablas MapInfo, archivos KML (Keyhole Markup Language), GeoJSON, TopoJSON y bases de datos geográficos de archivos ESRI. Tras ello, puede crear mapas de puntos, líneas o polígonos con los datos de esos archivos.*

[https://help.tableau.com/current/pro/desktop/es-es/maps\\_shapefiles.htm](https://help.tableau.com/current/pro/desktop/es-es/maps_shapefiles.htm)

# Tableau

Divisiones personalizadas con Shapefile + Tableau

The screenshot shows the Tableau desktop application interface. On the left, the 'Conecciones' (Connections) pane lists 'portland\_1972-2018' (Archivo de texto), 'Police\_Districts\_PPB' (Shapefile), 'Neighborhood\_Boundaries' (Shapefile), and 'Nueva unión' (New union). The 'Archivos' (Files) pane shows 'Police\_Districts\_PPB.shp'. The main workspace displays a 'portland\_1972-2018.csv' file containing data about theft from motor vehicles and vandalism. A tooltip for the 'Unión' (Union) tool is open, showing options: 'Interior', 'Izquierda', 'Derecha', and 'Exterior completo'. Below the union tool, there are buttons for 'Fuente de datos' (Data source), 'MAKEPOINT([Latitud], [Longitud])', 'Intersects', 'Geometría', and 'Añadir nueva cláusula de unión'. The bottom of the screen shows the Tableau ribbon with tabs like 'Fuente de datos', 'Por vecindario y tipo', 'Por mes', 'Por mes, pronóstico', 'Mapa', 'Heatmap', 'Heatmap (animado)', 'Mapa (2)', and 'Analizar'.

# Tableau

Divisiones personalizadas con QGIS + Tableau

