



# Ingeniería de Características

Semestre 2023-2

Julio Weissman

[julio.waissman@unison.mx](mailto:julio.waissman@unison.mx)

# Metodo de trabajo

---



Clases  
presenciales



Mucho trabajo  
autónomo



Uso de muchas  
herramientas

# Que herramientas vamos a usar

[Teams](#) para los cursos presenciales a distancia, archivos, encuestas y evidencias

[Página](#) de Github del curso con material y enlaces

[DataCamp](#), [EdX](#), [Coursera](#) y otros MOOCs para partes de contenido de cursos

[Kaggle](#) para datos, problemas y actividades de aprendizaje

[Github](#) para los trabajos prácticos

[Medium](#) para lectura de documentos y escritura de blogs

# Como vamos a trabajar

---

## **martes**

Dos horas el martes (6 a 8 p.m.) con el tema nuevo de la semana

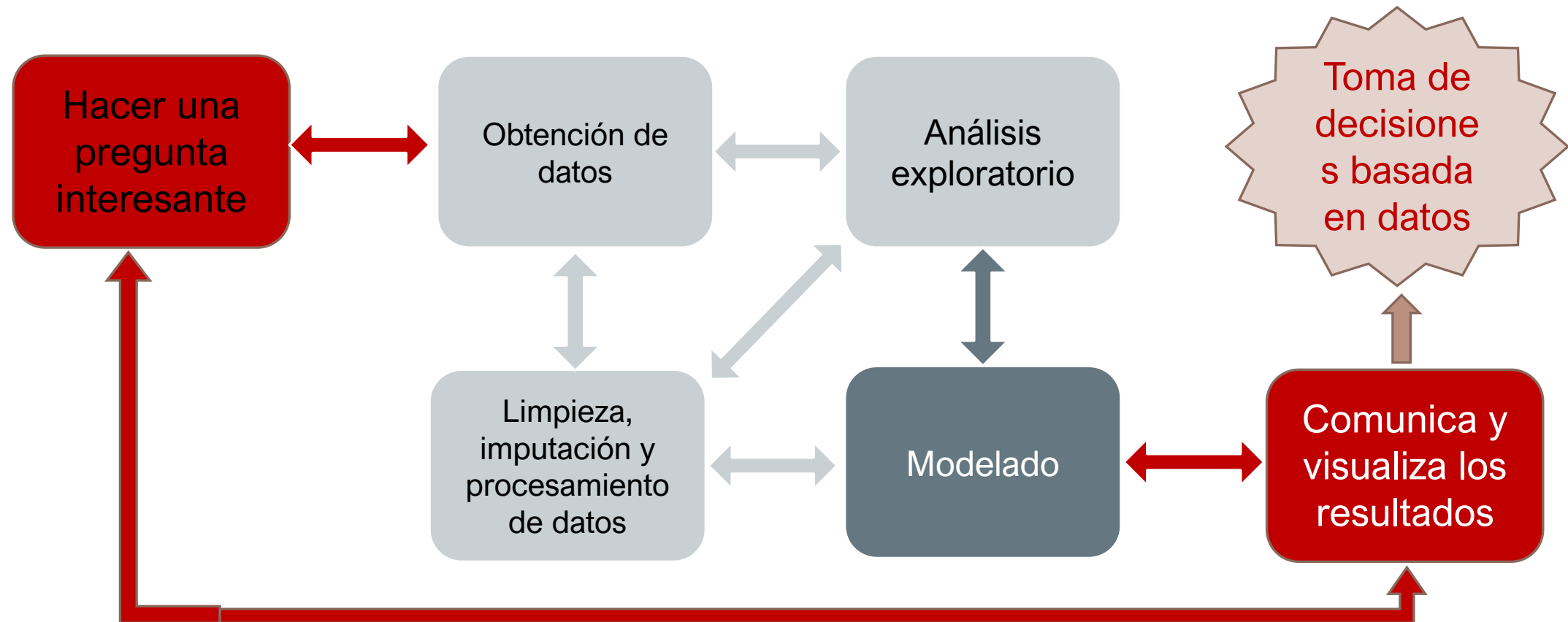
## **sábado**

Dos horas el sábado (10 a 12 p.m.) para aspectos prácticos, cerrar el tema y tópicos complementarios

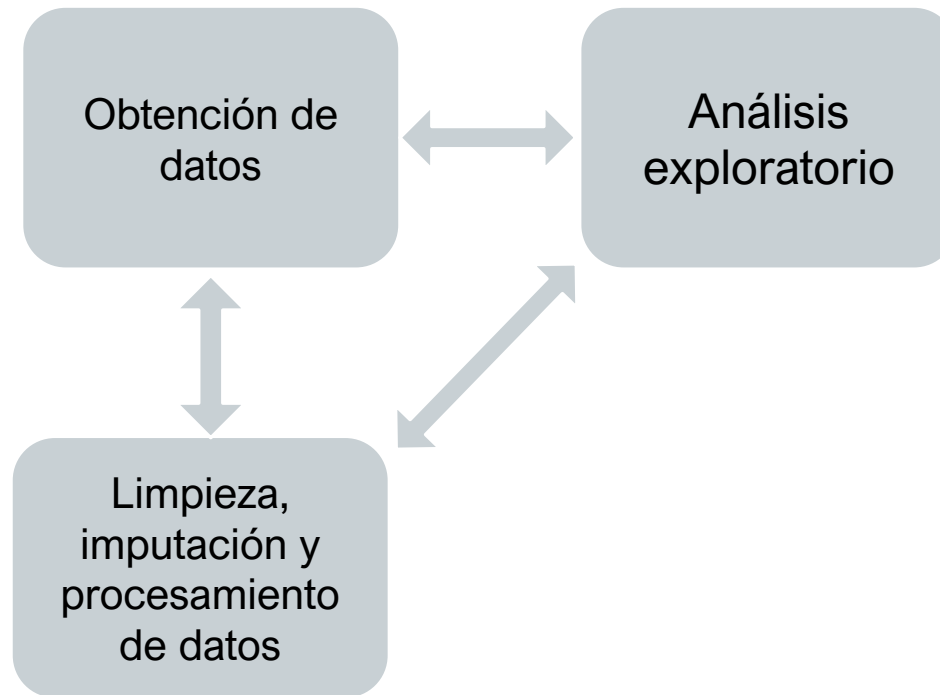
## **jueves y viernes**

Tres horas de trabajo independiente para avanzar en las actividades asignadas el martes (asesorías incluidas)

# Motivación



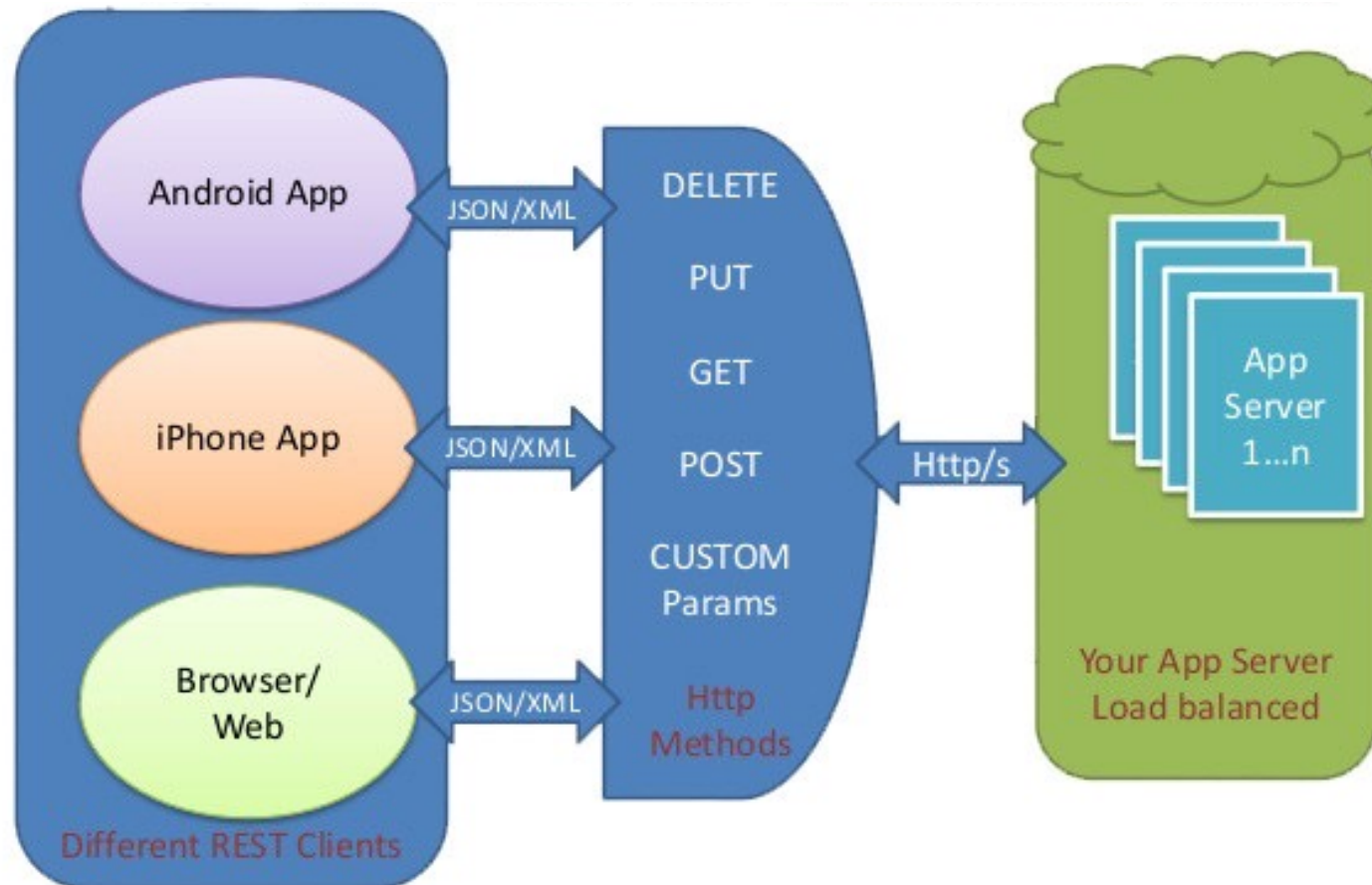
# Motivación



# Como queremos los datos

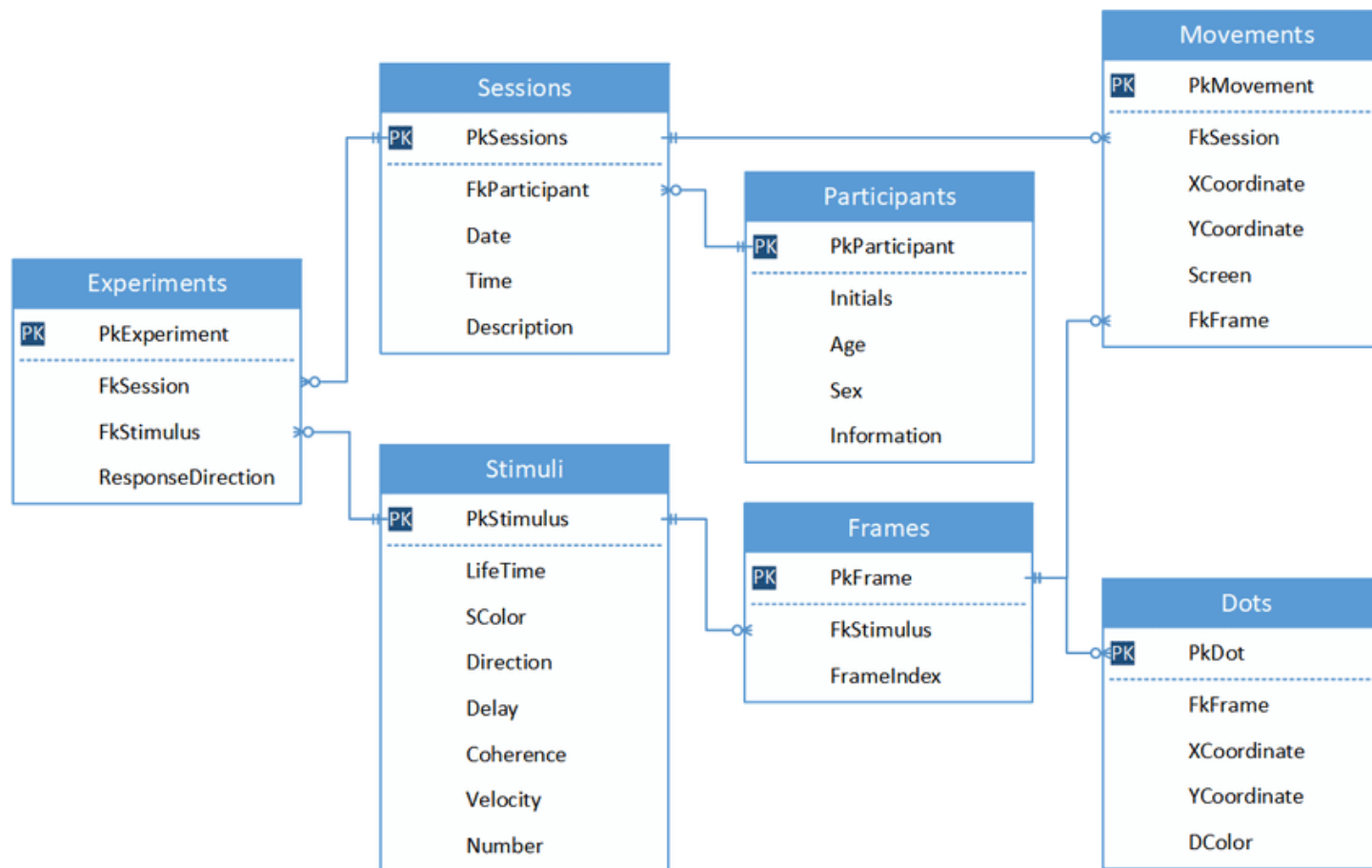
|    | UID      | iso2 | iso3 | code3 | FIPS  | Admin2       | Province_State           | Country_Region | Lat       | Long_      | Combined_Key                  | 1/22/20 | 1/23/20 | 1/24/20 | 1/25/20 |
|----|----------|------|------|-------|-------|--------------|--------------------------|----------------|-----------|------------|-------------------------------|---------|---------|---------|---------|
| 1  | 16       | AS   | ASM  | 16    | 60    |              | American Samoa           | US             | -14.27100 | -170.13200 | American Samoa, US            | 0       | 0       | 0       | 0       |
| 2  | 316      | GU   | GUM  | 316   | 66    |              | Guam                     | US             | 13.44430  | 144.79370  | Guam, US                      | 0       | 0       | 0       | 0       |
| 3  | 580      | MP   | MNP  | 580   | 69    |              | Northern Mariana Islands | US             | 15.09790  | 145.67390  | Northern Mariana Islands, US  | 0       | 0       | 0       | 0       |
| 4  | 63072001 | PR   | PRI  | 630   | 72001 | Adjuntas     | Puerto Rico              | US             | 18.18012  | -66.75437  | Adjuntas, Puerto Rico, US     | 0       | 0       | 0       | 0       |
| 5  | 63072003 | PR   | PRI  | 630   | 72003 | Aguada       | Puerto Rico              | US             | 18.36025  | -67.17513  | Aguada, Puerto Rico, US       | 0       | 0       | 0       | 0       |
| 6  | 63072005 | PR   | PRI  | 630   | 72005 | Aguadilla    | Puerto Rico              | US             | 18.45968  | -67.12082  | Aguadilla, Puerto Rico, US    | 0       | 0       | 0       | 0       |
| 7  | 63072007 | PR   | PRI  | 630   | 72007 | Aguas Buenas | Puerto Rico              | US             | 18.25162  | -66.12681  | Aguas Buenas, Puerto Rico, US | 0       | 0       | 0       | 0       |
| 8  | 63072009 | PR   | PRI  | 630   | 72009 | Aibonito     | Puerto Rico              | US             | 18.13136  | -66.26413  | Aibonito, Puerto Rico, US     | 0       | 0       | 0       | 0       |
| 9  | 63072011 | PR   | PRI  | 630   | 72011 | Anasco       | Puerto Rico              | US             | 18.28798  | -67.12061  | Anasco, Puerto Rico, US       | 0       | 0       | 0       | 0       |
| 10 | 63072013 | PR   | PRI  | 630   | 72013 | Arecibo      | Puerto Rico              | US             | 18.40663  | -66.67508  | Arecibo, Puerto Rico, US      | 0       | 0       | 0       | 0       |
| 11 | 63072015 | PR   | PRI  | 630   | 72015 | Arroyo       | Puerto Rico              | US             | 17.99846  | -66.05655  | Arroyo, Puerto Rico, US       | 0       | 0       | 0       | 0       |
| 12 | 63072017 | PR   | PRI  | 630   | 72017 | Barceloneta  | Puerto Rico              | US             | 18.44553  | -66.56053  | Barceloneta, Puerto Rico, US  | 0       | 0       | 0       | 0       |
| 13 | 63072019 | PR   | PRI  | 630   | 72019 | Barranquitas | Puerto Rico              | US             | 18.20159  | -66.30963  | Barranquitas, Puerto Rico, US | 0       | 0       | 0       | 0       |
| 14 | 63072021 | PR   | PRI  | 630   | 72021 | Bayamon      | Puerto Rico              | US             | 18.34946  | -66.16844  | Bayamon, Puerto Rico, US      | 0       | 0       | 0       | 0       |
| 15 | 63072023 | PR   | PRI  | 630   | 72023 | Cabo Rojo    | Puerto Rico              | US             | 18.04099  | -67.15439  | Cabo Rojo, Puerto Rico, US    | 0       | 0       | 0       | 0       |
| 16 | 63072025 | PR   | PRI  | 630   | 72025 | Caguas       | Puerto Rico              | US             | 18.21161  | -66.05078  | Caguas, Puerto Rico, US       | 0       | 0       | 0       | 0       |
| 17 | 63072027 | PR   | PRI  | 630   | 72027 | Camuy        | Puerto Rico              | US             | 18.41858  | -66.86021  | Camuy, Puerto Rico, US        | 0       | 0       | 0       | 0       |
| 18 | 63072029 | PR   | PRI  | 630   | 72029 | Canovanas    | Puerto Rico              | US             | 18.32880  | -65.88761  | Canovanas, Puerto Rico, US    | 0       | 0       | 0       | 0       |
| 19 | 63072031 | PR   | PRI  | 630   | 72031 | Carolina     | Puerto Rico              | US             | 18.37499  | -65.95683  | Carolina, Puerto Rico, US     | 0       | 0       | 0       | 0       |
| 20 | 63072033 | PR   | PRI  | 630   | 72033 | Catano       | Puerto Rico              | US             | 18.43727  | -66.14331  | Catano, Puerto Rico, US       | 0       | 0       | 0       | 0       |
| 21 | 63072035 | PR   | PRI  | 630   | 72035 | Cayey        | Puerto Rico              | US             | 18.10285  | -66.14914  | Cayey, Puerto Rico, US        | 0       | 0       | 0       | 0       |
| 22 | 63072037 | PR   | PRI  | 630   | 72037 | Ceiba        | Puerto Rico              | US             | 18.25182  | -65.66642  | Ceiba, Puerto Rico, US        | 0       | 0       | 0       | 0       |
| 23 | 63072039 | PR   | PRI  | 630   | 72039 | Ciales       | Puerto Rico              | US             | 18.28885  | -66.51647  | Ciales, Puerto Rico, US       | 0       | 0       | 0       | 0       |
| 24 | 63072041 | PR   | PRI  | 630   | 72041 | Cidra        | Puerto Rico              | US             | 18.17356  | -66.16118  | Cidra, Puerto Rico, US        | 0       | 0       | 0       | 0       |

# Como vienen los datos





# Como vienen los datos



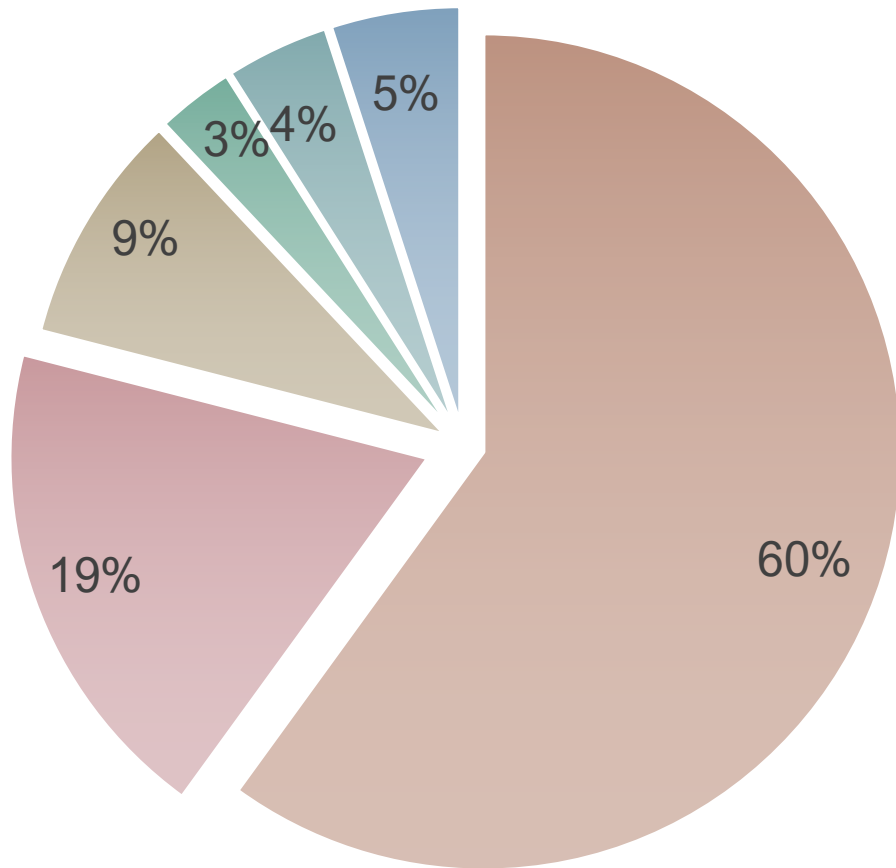
# Como vienen los datos

```
<page>
  <title>Julia Morilla de Campbell</title>
  <ns>0</ns>
  <id>4949229</id>
  <revision>
    <id>102979192</id>
    <parentid>100596558</parentid>
    <timestamp>2017-10-30T07:46:11Z</timestamp>
    <contributor>
      <username>InternetArchiveBot</username>
      <id>4704851</id>
    </contributor>
    <comment>Rescatando referencia 1 y marcando 0 como roto #IABot (v1.6)</comment>
    <model>wikitext</model>
    <format>text/x-wiki</format>
    <text xml:space="preserve" bytes="4165">'''Julia Morilla de Campbell''' ([[Rosario (Argentina)|Rosario]]
Nació en [[Rosario (provincia de Santa Fe)|Rosario]] ([[provincia de Santa Fe]]), hija de José María Morilla
Desde pequeña estudió canto varios años. En su adolescencia cantaba [[sevillana (música)|sevillanas]] y [[copl
```

# Como vienen los datos

| F21  |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
|------|--|-----------------------------------|---------|---|---|---|---|---|---|---|---|---|------|-------------|-------------|---------|----|--------------|--------------------------------|----|----|-------|---------------|----|----|---------------|------------------|---|----|-------------------|-----------------------------------|---|----|---------------------|---------------|---|
| A    | B  | C                                 | D       | E | F | G | H | I | J | K | L | M |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 1    |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 2    | <div><div>English</div><div>Area:</div><div>Customer's Task: sec</div><div>OEE:</div><div>Target Cycle Time: 0.0 sec</div><div>Tolerance Time: 0.0 sec</div></div>   |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 3    | <table><tr><th>Code</th><th>Description</th><th>Explanation</th><th>Sec (s)</th></tr><tr><td>va</td><td>Value Adding</td><td>Customer is willing to pay for</td><td>45</td></tr><tr><td>wa</td><td>Waste</td><td>to be reduced</td><td>29</td></tr><tr><td>wa</td><td>Obvious Waste</td><td>to be eliminated</td><td>7</td></tr><tr><td>wa</td><td>Material handling</td><td>to be checked if unit is logistic</td><td>0</td></tr><tr><td>pa</td><td>Periodic Activities</td><td>Current State</td><td>0</td></tr></table> |                                   |         |   |   |   |   |   |   |   |   |   | Code | Description | Explanation | Sec (s) | va | Value Adding | Customer is willing to pay for | 45 | wa | Waste | to be reduced | 29 | wa | Obvious Waste | to be eliminated | 7 | wa | Material handling | to be checked if unit is logistic | 0 | pa | Periodic Activities | Current State | 0 |
| Code | Description  | Explanation                       | Sec (s) |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| va   | Value Adding   | Customer is willing to pay for    | 45      |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| wa   | Waste  | to be reduced                     | 29      |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| wa   | Obvious Waste  | to be eliminated                  | 7       |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| wa   | Material handling  | to be checked if unit is logistic | 0       |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| pa   | Periodic Activities  | Current State                     | 0       |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 4    |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 5    |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 6    |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 7    |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 8    |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 9    |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 10   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 11   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 12   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 13   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 14   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 15   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 16   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 17   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 18   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 19   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 20   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 21   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 22   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 23   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 24   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 25   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 26   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 27   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 28   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 29   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 30   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 31   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 32   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 33   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 34   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 35   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 36   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 37   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 38   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 39   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 40   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 41   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 42   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 43   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 44   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 45   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 46   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 47   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 48   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 49   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 50   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 51   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 52   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 53   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 54   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 55   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 56   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 57   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 58   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 59   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 60   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 61   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 62   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 63   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 64   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 65   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 66   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 67   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 68   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 69   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 70   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 71   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 72   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 73   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 74   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 75   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 76   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 77   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 78   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 79   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 80   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 81   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 82   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 83   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 84   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 85   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 86   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 87   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 88   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 89   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 90   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 91   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 92   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 93   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 94   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 95   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 96   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 97   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 98   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 99   |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |
| 100  |  |                                   |         |   |   |   |   |   |   |   |   |   |      |             |             |         |    |              |                                |    |    |       |               |    |    |               |                  |   |    |                   |                                   |   |    |                     |               |   |

# ¿Qué hace un científico de datos?



- Limpieza y organización de datos
- Búsqueda de conjuntos de datos
- Minería de datos
- Construcción de conjuntos de entrenamiento
- Entrenamiento de modelos
- Otros



## Objetivo del curso

# Temario

## Integración de datos de diferentes fuentes

- Lectura de formatos csv, json, xml, sql.
- Uso de APIs

## Limpieza de datos

- Datos numéricos
- Datos cualitativos
- Cadenas de caracteres
- Series de tiempo

# Temario

## Transformación de datos

- Valores perdidos e imputación de datos
- Agregación
- Generación de características

## Análisis exploratorio de datos

- Indicadores claves de desempeño
- Herramientas para EDA
- Principios básicos de visualización
- Desarrollo de tableros para EDA

# Temario

## Casos especiales

- Información georeferenciada
- Series de tiempo
- Detección de anomalías

## Reducción de datos

- Selección de características
- Análisis en componentes principales
- Otras técnicas de reducción



# Criterios de evaluación



Comunicación (20%)



Evidencias de aprendizaje (40%)



Proyectos (40%)