



TECNOLÓGICO NACIONAL DE MÉXICO
INSTITUTO TECNOLÓGICO DE TIJUANA
Subdirección Académica
Departamento de sistemas y computación

Semestre:
Agosto - Diciembre 2021

Materia:
Minería de Datos

Nombre del trabajo:
Práctica Evaluatoria - Unidad 1

UNIDAD A EVALUAR:
Unidad I

NOMBRE Y NÚMERO DE CONTROL DEL ALUMNO:
Victor Fabian Hernandez Lamarque | 16212536
Cristopher Arael Garcia Torres | 17210892

NOMBRE DEL MAESTRO (A):
JOSE CHRISTIAN ROMERO



El Banco Mundial quedó muy impresionado con su entrega en la asignación anterior y tienen un nuevo proyecto para usted.

#Incluimos la librería ggplot2 ya que con esta vamos a generar nuestros diagramas de dispersión

```
library(ggplot2)
```

#Creamos una variable y le Introducimos nuestro data frame y lo guardamos en esta misma variable

```
stats <- read.csv("DataFramesEvaluation_Data.csv")  
stats
```

```
crisostomo_kristi_dalia_torres_177220894  
> stats <- read.csv("DataFramesEvaluation_Data.csv")  
> stats
```

	Country.Name	Country.Code	Region	Year	Fertility.Rate
1	Aruba	ABW	The Americas	1960	4.820
2	Afghanistan	AFG	Asia	1960	7.450
3	Angola	AGO	Africa	1960	7.379
4	Albania	ALB	Europe	1960	6.186
5	United Arab Emirates	ARE	Middle East	1960	6.928
6	Argentina	ARG	The Americas	1960	3.109
7	Armenia	ARM	Asia	1960	4.550
8	Antigua and Barbuda	ATG	The Americas	1960	4.425
9	Australia	AUS	Oceania	1960	3.453
10	Austria	AUT	Europe	1960	2.690
11	Azerbaijan	AZE	Asia	1960	5.571
12	Burundi	BDI	Africa	1960	6.953
13	Belgium	BEL	Europe	1960	2.540
14	Benin	BEN	Africa	1960	6.282
15	Burkina Faso	BFA	Africa	1960	6.291
16	Bangladesh	BGD	Asia	1960	6.725
17	Bulgaria	BGR	Europe	1960	2.310
18	Bahrain	BHR	Middle East	1960	7.090
19	Bahamas, The	BHS	The Americas	1960	4.495
20	Bosnia and Herzegovina	BIH	Europe	1960	3.770
21	Belarus	BLR	Europe	1960	2.670
22	Belize	BLZ	The Americas	1960	6.500
23	Bolivia	BOL	The Americas	1960	6.700
24	Brazil	BRA	The Americas	1960	6.210
25	Barbados	BRB	The Americas	1960	4.233
26	Brunei Darussalam	BRN	Asia	1960	6.487
27	Bhutan	BTN	Asia	1960	6.670
28	Botswana	BWA	Africa	1960	6.615
29	Central African Republic	CAF	Africa	1960	5.840
30	Canada	CAN	The Americas	1960	3.511
31	Switzerland	CHE	Europe	1960	2.440
32	Chile	CHL	The Americas	1960	5.113
33	China	CHN	Asia	1960	5.758
34	Cote d'Ivoire	CIV	Africa	1960	7.351
35	Cameroon	CMR	Africa	1960	5.647
36	Congo, Rep.	COG	Africa	1960	5.880
37	Colombia	COL	The Americas	1960	6.807
38	Comoros	COM	Africa	1960	6.792
39	Cabo Verde	CPV	Africa	1960	6.885
40	Costa Rica	CRI	The Americas	1960	6.451
41	Cuba	CUB	The Americas	1960	4.182
42	Cyprus	CYP	Europe	1960	3.500
43	Czech Republic	CZE	Europe	1960	2.090
44	Germany	DEU	Europe	1960	2.370
45	Djibouti	DJI	Africa	1960	6.461
46	Denmark	DNK	Europe	1960	3.570

#Ejecutamos el vector de código por país para tener los datos a utilizar más adelante

```
Country_Code <-  
c("ABW", "AFG", "AGO", "ALB", "ARE", "ARG", "ARM", "ATG", "AUS", "AUT", "AZE", "BDI", "BEL", "BEN", "BFA", "BGD", "BGR", "BHR", "BHS", "BIH", "BLR", "BLZ", "BOL", "BRA", "BRB", "BRN", "BTN", "BWA", "CAF", "CAN", "CHE", "CHL", "CHN", "CIV", "CMR", "COG", "COL", "COM", "CPV", "CRI", "CUB", "CYP", "CZE", "DEU", "DJI", "DNK", "DOM", "DZA", "ECU", "EGY", "ERI", "ESP", "EST", "ETH", "FIN", "FJI", "FRA", "FSM", "GAB", "GBR", "GEO", "GHA", "GIN", "GMB", "GNB", "GNQ", "GRC", "GRD", "GTM", "GUM", "GUY", "HKG", "HND", "HRV", "HTI", "HUN", "IDN", "IND", "IRL", "IRN", "IRQ", "ISL", "ITA", "JAM", "JOR", "JPN", "KAZ", "KEN", "KGZ", "KHM", "KIR", "KOR", "KWT", "LAO", "LBN", "LBR", "LBY", "LCA", "LKA", "LSO", "LTU", "LUX", "LVA", "MAC", "MAR", "MDA", "MDG", "MDV", "MEX", "MKD", "MLI", "MLT", "MMR", "MNE", "MNG", "MOZ", "MRT", "MUS", "MWI", "MYS", "NAM", "NCL", "NER", "NGA", "NIC", "NLD", "NOR", "NPL", "NZL", "OMN", "PAK", "PAN", "PER", "PHL", "PNG", "POL", "PRI", "PRT", "PRY", "PYF", "QAT", "ROU", "RUS", "RWA", "SAU", "SDN", "SEN", "SGP", "SLB", "SLE", "SLV", "SOM", "SSD", "STP", "SUR", "SVK", "SVN", "SWE", "SWZ", "SYR", "TCD",
```



"TGO", "THA", "TJK", "TKM", "TLS", "TON", "TTO", "TUN", "TUR", "TZA", "UGA", "UKR", "URY", "USA", "UZB",
", "VCT", "VEN", "VIR", "VNM", "VUT", "WSM", "YEM", "ZAF", "COD", "ZMB", "ZWE")

```
[ Reached max / getoption(max.print) == omitted 1/4 rows ]  
> #Execute below code to generate three new vectors  
> Country_Code <- c("ABW", "AFG", "AGO", "ALB", "ARE", "ARG", "ARM", "ATG", "AUS", "AUT", "AZE", "BDI", "BEL", "BEN", "BFA", "BGD", "BG  
R", "BHR", "BHS", "BIH", "BLR", "BLZ", "BOL", "BRA", "BRB", "BRN", "BTN", "BWA", "CAF", "CAN", "CHE", "CHL", "CHN", "CIV", "CMR", "COG", "CO  
L", "COM", "CPV", "CRI", "CUB", "CYP", "CZE", "DEU", "DJI", "DNK", "DOM", "DZA", "ECU", "EGY", "ERI", "ESP", "EST", "ETH", "FIN", "FJI", "FR  
A", "FSM", "GAB", "GBR", "GEO", "GHA", "GIN", "GMB", "GNB", "GNQ", "GRC", "GRD", "GTM", "GUM", "GUY", "HKG", "HND", "HRV", "HTI", "HUN", "ID  
N", "IND", "IRL", "IRN", "IRQ", "ISL", "ITA", "JAM", "JOR", "JPN", "KAZ", "KEN", "KGZ", "KHM", "KIR", "KOR", "KWT", "LAO", "LBN", "LBR", "LB  
Y", "LCA", "LKA", "LSO", "LTU", "LUX", "LVA", "MAC", "MAR", "MDA", "MDG", "MDV", "MEX", "MKD", "MLI", "MLT", "MMR", "MNE", "MNG", "MOZ", "MR  
T", "MUS", "MWI", "MYS", "NAM", "NCL", "NER", "NGA", "NIC", "NLD", "NOR", "NPL", "NZL", "OMN", "PAK", "PAN", "PER", "PHL", "PNG", "POL", "PR  
I", "PRY", "PRY", "PYF", "QAT", "ROU", "RUS", "RWA", "SAU", "SDN", "SEN", "SGP", "SLB", "SLE", "SLV", "SOM", "SSD", "STP", "SUR", "SVK", "SV  
N", "SWE", "SWZ", "SYR", "TCD", "THA", "TJK", "TKM", "TLS", "TON", "TTO", "TUN", "TUR", "TZA", "UGA", "UKR", "URY", "USA", "UZB", "VC  
T", "VEN", "VIR", "VNM", "VUT", "WSM", "YEM", "ZAF", "COD", "ZMB", "ZWE")  
> |
```

*#Ejecutamos el vector de esperanza de vida en el año de 1960 para tener los datos a
utilizar más adelante*

Life_Expectancy_At_Birth_1960 <-

```
c(65.5693658536586, 32.328512195122, 32.9848292682927, 62.2543658536585, 52.2432195121951, 65  
.2155365853659, 65.8634634146342, 61.7827317073171, 70.8170731707317, 68.5856097560976, 60.83  
6243902439, 41.2360487804878, 69.7019512195122, 37.2782682926829, 34.4779024390244, 45.829317  
0731707, 69.2475609756098, 52.0893658536585, 62.7290487804878, 60.2762195121951, 67.708097560  
9756, 59.9613658536585, 42.1183170731707, 54.2054634146342, 60.7380487804878, 62.500365853658  
5, 32.3593658536585, 50.5477317073171, 36.4826341463415, 71.1331707317073, 71.3134146341463, 5  
7.4582926829268, 43.4658048780488, 36.8724146341463, 41.523756097561, 48.5816341463415, 56.71  
6756097561, 41.4424390243903, 48.8564146341463, 60.5761951219512, 63.9046585365854, 69.593926  
8292683, 70.3487804878049, 69.3129512195122, 44.0212682926829, 72.1765853658537, 51.845268292  
6829, 46.1351219512195, 53.215, 48.0137073170732, 37.3629024390244, 69.1092682926829, 67.90597  
56097561, 38.4057073170732, 68.819756097561, 55.9584878048781, 69.8682926829268, 57.586585365  
8537, 39.5701219512195, 71.1268292682927, 63.4318536585366, 45.8314634146342, 34.886390243902  
4, 32.0422195121951, 37.8404390243902, 36.7330487804878, 68.1639024390244, 59.8159268292683, 4  
5.5316341463415, 61.2263414634146, 60.2787317073171, 66.9997073170732, 46.2883170731707, 64.6  
086585365854, 42.1000975609756, 68.0031707317073, 48.6403170731707, 41.1719512195122, 69.6917  
56097561, 44.945512195122, 48.0306829268293, 73.4286585365854, 69.1239024390244, 64.191829268  
2927, 52.6852682926829, 67.6660975609756, 58.3675853658537, 46.3624146341463, 56.128073170731  
7, 41.2320243902439, 49.2159756097561, 53.0013170731707, 60.3479512195122, 43.2044634146342, 6  
3.2801219512195, 34.7831707317073, 42.6411951219512, 57.303756097561, 59.7471463414634, 46.51  
07073170732, 69.8473170731707, 68.4463902439024, 69.7868292682927, 64.6609268292683, 48.44663  
41463415, 61.8127804878049, 39.9746829268293, 37.2686341463415, 57.0656341463415, 60.62280487  
80488, 28.2116097560976, 67.6017804878049, 42.7363902439024, 63.7056097560976, 48.36880487804  
88, 35.0037073170732, 43.4830975609756, 58.7452195121951, 37.7736341463415, 59.4753414634146,  
46.8803902439024, 58.6390243902439, 35.5150487804878, 37.1829512195122, 46.9988292682927, 73.  
3926829268293, 73.549756097561, 35.1708292682927, 71.2365853658537, 42.6670731707317, 45.2904  
634146342, 60.8817073170732, 47.6915853658537, 57.8119268292683, 38.462243902439, 67.68048780  
48781, 68.7196097560976, 62.8089268292683, 63.7937073170732, 56.3570487804878, 61.20607317073  
17, 65.6424390243903, 66.0552926829268, 42.2492926829268, 45.6662682926829, 48.1876341463415,  
38.206, 65.6598292682927, 49.3817073170732, 30.3315365853659, 49.9479268292683, 36.9658780487  
805, 31.6767073170732, 50.4513658536585, 59.6801219512195, 69.9759268292683, 68.9780487804878  
, 73.0056097560976, 44.2337804878049, 52.768243902439, 38.0161219512195, 40.2728292682927, 54.
```



6993170731707,56.1535365853659,54.4586829268293,33.7271219512195,61.3645365853659,62.6575853658537,42.009756097561,45.3844146341463,43.6538780487805,43.9835609756098,68.2995365853659,67.8963902439025,69.7707317073171,58.8855365853659,57.7238780487805,59.2851219512195,63.7302195121951,59.0670243902439,46.4874878048781,49.969512195122,34.3638048780488,49.0362926829268,41.0180487804878,45.1098048780488,51.5424634146342)

```
R4.1.1 -> Life_Expectancy_At_Birth_1960 <- c(65.5693658536586,32.328512195122,32.9848292682927,62.2543658536585,52.2432195121951,65.2155365853659,65.8634634146342,61.7827317073171,70.8170731707317,68.5856097560976,60.836243902439,41.2360487804878,69.7019512195122,37.2782682926829,34.4779024390244,45.8293170731707,69.2475609756098,52.0893658536585,62.7290487804878,60.2762195121951,67.7080975609756,59.9613658536585,42.1183170731707,54.2054634146342,60.7380487804878,62.5003658536585,32.3593658536585,50.5477317073171,36.4826341463415,71.1331707317073,71.3134146341463,57.4582926829268,43.4658048780488,36.8724146341463,41.523756097561,48.5816341463415,56.716756097561,41.4424390243903,48.8564146341463,60.5761951219512,63.9046585365854,69.5939268292683,70.3487804878049,69.3129512195122,44.0212682926829,72.1765853658537,51.8452682926829,46.1351219512195,53.215,48.0137073170732,37.3629024390244,69.1092682926829,67.9059756097561,38.4057073170732,68.819756097561,55.9584878048781,69.8682926829268,57.5865853658537,39.5701219512195,71.1268292682927,63.4318536585366,45.8314634146342,34.8863902439024,32.0422195121951,37.8404390243902,36.7330487804878,68.1639024390244,59.8159268292683,45.5316341463415,61.2263414634146,60.2787317073171,66.9997073170732,46.2883170731707,64.6086585365854,42.1000975609756,68.0031707317073,48.6403170731707,41.1719512195122,69.691756097561,44.945512195122,48.0306829268293,73.4286585365854,69.1239024390244,64.1918292682927,52.6852682926829,67.6660975609756,58.3675853658537,46.3624146341463,56.1280731707317,41.2320243902439,49.2159756097561,53.0013170731707,60.3479512195122,43.2044634146342,63.2801219512195,34.7831707317073,42.6411951219512,57.303756097561,59.7471463414634,46.5107073170732,69.8473170731707,68.4463902439024,69.7868292682927,64.6609268292683,48.4466341463415,61.8127804878049,39.9746829268293,37.2686341463415,57.0656341463415,60.6228048780488,28.2116097560976,67.6017804878049,42.7363902439024,63.7056097560976,48.3688048780488,35.0037073170732,43.4830975609756,58.7452195121951,37.7736341463415,59.4753414634146,46.8803902439024,58.6390243902439,35.5150487804878,37.1829512195122,46.9988292682927,73.3926829268293,73.549756097561,35.1708292682927,71.2365853658537,42.6670731707317,45.2904634146342,60.8817073170732,47.6915853658537,57.8119268292683,38.462243902439,67.6804878048781,68.7196097560976,62.8089268292683,63.7937073170732,56.3570487804878,61.2060731707317,65.6424390243903,66.0552926829268,42.2492926829268,45.6662682926829,48.1876341463415,38.206,65.6598292682927,49.3817073170732,30.3315365853659,49.9479268292683,36.9658780487805,31.6767073170732,50.4513658536585,59.6801219512195,69.9759268292683,68.9780487804878,73.0056097560976,44.2337804878049,52.768243902439,38.0161219512195,40.2728292682927,54.6993170731707,56.1535365853659,54.4586829268293,33.7271219512195,61.3645365853659,62.6575853658537,42.009756097561,45.3844146341463,43.6538780487805,43.9835609756098,68.2995365853659,67.8963902439025,69.7707317073171,58.8855365853659,57.7238780487805,59.2851219512195,63.7302195121951,59.0670243902439,46.4874878048781,49.969512195122,34.3638048780488,49.0362926829268,41.0180487804878,45.1098048780488,51.5424634146342)
```

#Ejecutamos el vector de esperanza de vida en el año de 2013 para tener los datos a utilizar más adelante

```
Life_Expectancy_At_Birth_2013 <- c(75.3286585365854,60.0282682926829,51.8661707317073,77.537243902439,77.1956341463415,75.9860975609756,74.5613658536585,75.7786585365854,82.1975609756098,80.890243902439,70.6931463414634,56.2516097560976,80.3853658536585,59.3120243902439,58.2406341463415,71.245243902439,74.4658536585366,76.5459512195122,75.0735365853659,76.2769268292683,72.4707317073171,69.9820487804878,67.9134390243903,74.1224390243903,75.3339512195122,78.5466585365854,69.1029268292683,64.3608048780488,49.8798780487805,81.4011219512195,82.7487804878049,81.1979268292683,75.3530243902439,51.2084634146342,55.0418048780488,61.6663902439024,73.8097317073171,62.9321707317073,72.9723658536585,79.2252195121951,79.2563902439025,79.9497804878049,78.2780487804878,81.0439024390244,61.6864634146342,80.3024390243903,73.3199024390244,74.5689512195122,75.648512195122,70.9257804878049,63.1778780487805,82.4268292682927,76.4243902439025,63.4421951219512,80.8317073170732,69.9179268292683,81.9682926829268,68.9733902439024,63.8435853658537,80.9560975609756,74.079512195122,61.1420731707317,58.21
```



6487804878, 59.9992682926829, 54.8384146341464, 57.2908292682927, 80.6341463414634, 73.193560
9756098, 71.4863902439024, 78.872512195122, 66.3100243902439, 83.8317073170732, 72.9428536585
366, 77.1268292682927, 62.4011463414634, 75.2682926829268, 68.7046097560976, 67.6604146341463
, 81.0439024390244, 75.1259756097561, 69.4716829268293, 83.1170731707317, 82.290243902439, 73.
4689268292683, 73.9014146341463, 83.3319512195122, 70.45, 60.9537804878049, 70.2024390243902,
67.7720487804878, 65.7665853658537, 81.459756097561, 74.462756097561, 65.687243902439, 80.128
8780487805, 60.5203902439024, 71.6576829268293, 74.9127073170732, 74.2402926829268, 49.331463
4146342, 74.1634146341464, 81.7975609756098, 73.9804878048781, 80.3391463414634, 73.709048780
4878, 68.811512195122, 64.6739024390244, 76.6026097560976, 76.5326585365854, 75.1870487804878
, 57.5351951219512, 80.7463414634146, 65.6540975609756, 74.7583658536585, 69.0618048780488, 54
.641512195122, 62.8027073170732, 74.46, 61.466, 74.567512195122, 64.3438780487805, 77.12195121
95122, 60.8281463414634, 52.4421463414634, 74.514756097561, 81.1048780487805, 81.451219512195
1, 69.222, 81.4073170731707, 76.8410487804878, 65.9636829268293, 77.4192195121951, 74.28385365
85366, 68.1315609756097, 62.4491707317073, 76.8487804878049, 78.7111951219512, 80.37317073170
73, 72.7991707317073, 76.3340731707317, 78.4184878048781, 74.4634146341463, 71.0731707317073,
63.3948292682927, 74.1776341463415, 63.1670487804878, 65.878756097561, 82.3463414634146, 67.7
189268292683, 50.3631219512195, 72.4981463414634, 55.0230243902439, 55.2209024390244, 66.2595
12195122, 70.99, 76.2609756097561, 80.2780487804878, 81.7048780487805, 48.9379268292683, 74.71
57804878049, 51.1914878048781, 59.1323658536585, 74.2469268292683, 69.4001707317073, 65.45656
09756098, 67.5223658536585, 72.6403414634147, 70.3052926829268, 73.6463414634147, 75.17595121
95122, 64.2918292682927, 57.7676829268293, 71.159512195122, 76.8361951219512, 78.841463414634
1, 68.2275853658537, 72.8108780487805, 74.0744146341464, 79.6243902439024, 75.756487804878, 71
.669243902439, 73.2503902439024, 63.583512195122, 56.7365853658537, 58.2719268292683, 59.2373
658536585, 55.633)

```
R 4.1.1 ~ /> Life_Expectancy_At_Birth_2013 <- c(75.3286585365854, 60.0282682926829, 51.8661707317073, 77.537243902439, 77.1956341463415, 9860975609756, 74.5613658536585, 75.7786585365854, 82.1975609756098, 80.890243902439, 70.6931463414634, 56.2516097560976, 80.388536585, 59.3120243902439, 58.2406341463415, 71.245243902439, 74.4658536585366, 76.5459512195122, 75.0735365853659, 76.2769268292683, 72.4707317073171, 69.9820487804878, 67.9134390243903, 74.1224390243903, 75.3339512195122, 78.5466585365854, 69.1029268292683, 3608048780488, 49.8798780487805, 81.4011219512195, 82.7487804878049, 81.1979268292683, 75.3530243902439, 51.2084634146342, 55.048780488, 61.6663902439024, 73.8097317073171, 62.9321707317073, 72.9723658536585, 79.2252195121951, 79.2563902439025, 79.94978049, 78.2780487804878, 81.0439024390244, 61.6864634146342, 80.3024390243903, 73.3199024390244, 74.5689512195122, 75.648512195122, 0.9257804878049, 63.1778780487805, 82.4268292682927, 76.4243902439025, 63.4421951219512, 80.8317073170732, 69.9179268292683, 81.29268292683, 68.9733902439024, 63.8435853658537, 80.9560975609756, 74.079512195122, 61.1420731707317, 58.216487804878, 59.999268292683, 54.8384146341464, 57.2908292682927, 80.6341463414634, 73.1935609756098, 71.4863902439024, 78.872512195122, 66.3100243902439, 83.8317073170732, 72.9428536585366, 77.1268292682927, 62.4011463414634, 75.2682926829268, 68.7046097560976, 67.6604146341463, 81.0439024390244, 75.1259756097561, 69.4716829268293, 83.1170731707317, 82.290243902439, 73.4689268292683, 73.9014146341463, 83.33195122, 70.45, 60.9537804878049, 70.2024390243902, 67.7720487804878, 65.7665853658537, 81.459756097561, 74.462756097561, 65.687243902439, 80.1288780487805, 60.5203902439024, 71.6576829268293, 74.9127073170732, 74.2402926829268, 49.3314634146342, 74.1634146341463, 81.7975609756098, 73.9804878048781, 80.3391463414634, 73.7090487804878, 68.811512195122, 64.6739024390244, 76.6026097560976, 76.5326585365854, 75.1870487804878, 57.5351951219512, 80.7463414634146, 65.6540975609756, 74.7583658536585, 69.0618048780488, 54.6415122, 62.8027073170732, 74.46, 61.466, 74.567512195122, 64.3438780487805, 77.1219512195122, 60.8281463414634, 52.4421463414634, 74.514756097561, 81.1048780487805, 81.4512195121951, 69.222, 81.4073170731707, 76.8410487804878, 65.9636829268293, 77.4192195121951, 73.8536585366, 68.1315609756097, 62.4491707317073, 76.8487804878049, 78.7111951219512, 80.3731707317073, 72.7991707317073, 76.33407317, 78.4184878048781, 74.4634146341463, 71.0731707317073, 63.3948292682927, 74.1776341463415, 63.1670487804878, 65.878756097561, 82.3463414634146, 67.7189268292683, 50.3631219512195, 72.4981463414634, 55.0230243902439, 55.2209024390244, 66.259512195122, 9.76.2609756097561, 80.2780487804878, 81.7048780487805, 48.9379268292683, 74.7157804878049, 51.1914878048781, 59.1323658536585, 2469268292683, 69.4001707317073, 65.4565609756098, 67.5223658536585, 72.6403414634147, 70.3052926829268, 73.6463414634147, 75.1759512195122, 64.2918292682927, 57.7676829268293, 71.159512195122, 76.8361951219512, 78.8414634146341, 68.2275853658537, 72.8108780487805, 74.0744146341464, 79.6243902439024, 75.756487804878, 71.669243902439, 73.2503902439024, 63.583512195122, 56.7365853658537, 58.2719268292683, 59.2373658536585, 55.633)
```

#Apuntamos nuestra cabecera a nuestro DataFrame
head(stats)



R 4.1.1 · ~ /

> head(stats)

	Country.Name	Country.Code	Region	Year	Fertility.Rate
1	Aruba	ABW	The Americas	1960	4.820
2	Afghanistan	AFG	Asia	1960	7.450
3	Angola	AGO	Africa	1960	7.379
4	Albania	ALB	Europe	1960	6.186
5	United Arab Emirates	ARE	Middle East	1960	6.928
6	Argentina	ARG	The Americas	1960	3.109

> |

#-----

#DIAGRAMAS DE DISPERSIÓN EN 1960

#*Ratio de fertilidad y de esperanza de vida en el año 1960 por países

#creamos una variable y le asignamos los datos donde el ratio de fertilidad sea del año 1960 de nuestro DataFrame

Fertility.Rate_1960<- stats\$Year==1960

#Visualizamos los datos obtenidos en un vector

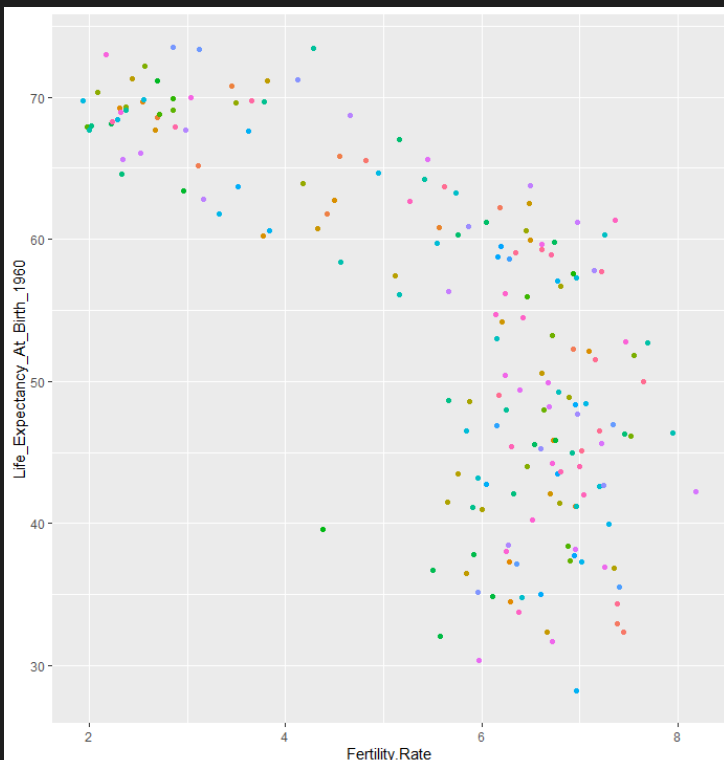
stats[Fertility.Rate_1960,]



Console Terminal Jobs					
R 4.1.1 ~ /					
> Fertility.Rate_1960<- stats\$Year==1960					
> stats[Fertility.Rate_1960,]					
	Country.Name	Country.Code	Region	Year	Fertility.Rate
1	Aruba	ABW	The Americas	1960	4.820
2	Afghanistan	AFG	Asia	1960	7.450
3	Angola	AGO	Africa	1960	7.379
4	Albania	ALB	Europe	1960	6.186
5	United Arab Emirates	ARE	Middle East	1960	6.928
6	Argentina	ARG	The Americas	1960	3.109
7	Armenia	ARM	Asia	1960	4.550
8	Antigua and Barbuda	ATG	The Americas	1960	4.425
9	Australia	AUS	Oceania	1960	3.453
10	Austria	AUT	Europe	1960	2.690
11	Azerbaijan	AZE	Asia	1960	5.571
12	Burundi	BDI	Africa	1960	6.953
13	Belgium	BEL	Europe	1960	2.540
14	Benin	BEN	Africa	1960	6.282
15	Burkina Faso	BFA	Africa	1960	6.291
16	Bangladesh	BGD	Asia	1960	6.725
17	Bulgaria	BGR	Europe	1960	2.310
18	Bahrain	BHR	Middle East	1960	7.090
19	Bahamas, The	BHS	The Americas	1960	4.495
20	Bosnia and Herzegovina	BIH	Europe	1960	3.770
21	Belarus	BLR	Europe	1960	2.670
22	Belize	BLZ	The Americas	1960	6.500
23	Bolivia	BOL	The Americas	1960	6.700
24	Brazil	BRA	The Americas	1960	6.210
25	Barbados	BRB	The Americas	1960	4.333
26	Brunei Darussalam	BRN	Asia	1960	6.487
27	Bhutan	BTN	Asia	1960	6.670
28	Botswana	BWA	Africa	1960	6.615
29	Central African Republic	CAF	Africa	1960	5.840
30	Canada	CAN	The Americas	1960	3.811
31	Switzerland	CHE	Europe	1960	2.440
32	Chile	CHL	The Americas	1960	5.113
33	China	CHN	Asia	1960	5.758
34	Cote d'Ivoire	CIV	Africa	1960	7.351
35	Cameroon	CMR	Africa	1960	5.647
36	Congo, Rep.	COG	Africa	1960	5.880
37	Colombia	COL	The Americas	1960	6.807
38	Comoros	COM	Africa	1960	6.792
39	Cabo Verde	CPV	Africa	1960	6.885
40	Costa Rica	CRI	The Americas	1960	6.451
41	Cuba	CUB	The Americas	1960	4.182
42	Cyprus	CYP	Europe	1960	3.500
43	Czech Republic	CZE	Europe	1960	2.090
44	Germany	DEU	Europe	1960	2.370
45	Djibouti	DJI	Africa	1960	6.461
46	Denmark	DNK	Europe	1960	2.570

#Creamos una variable y le asignamos la función ggplot utilizando como datos el vector donde el ratio de fertilidad sea en 1960 en el eje X y donde el eje Y sea la esperanza de vida del año 1960 y así mismo le decimos que nos muestre el color por país

```
graphic_1960<-ggplot(data=stats[Fertility.Rate_1960,]) +  
  aes(x=Fertility.Rate, y=Life_Expectancy_At_Birth_1960, color=Country_Code) +  
  geom_point()
```



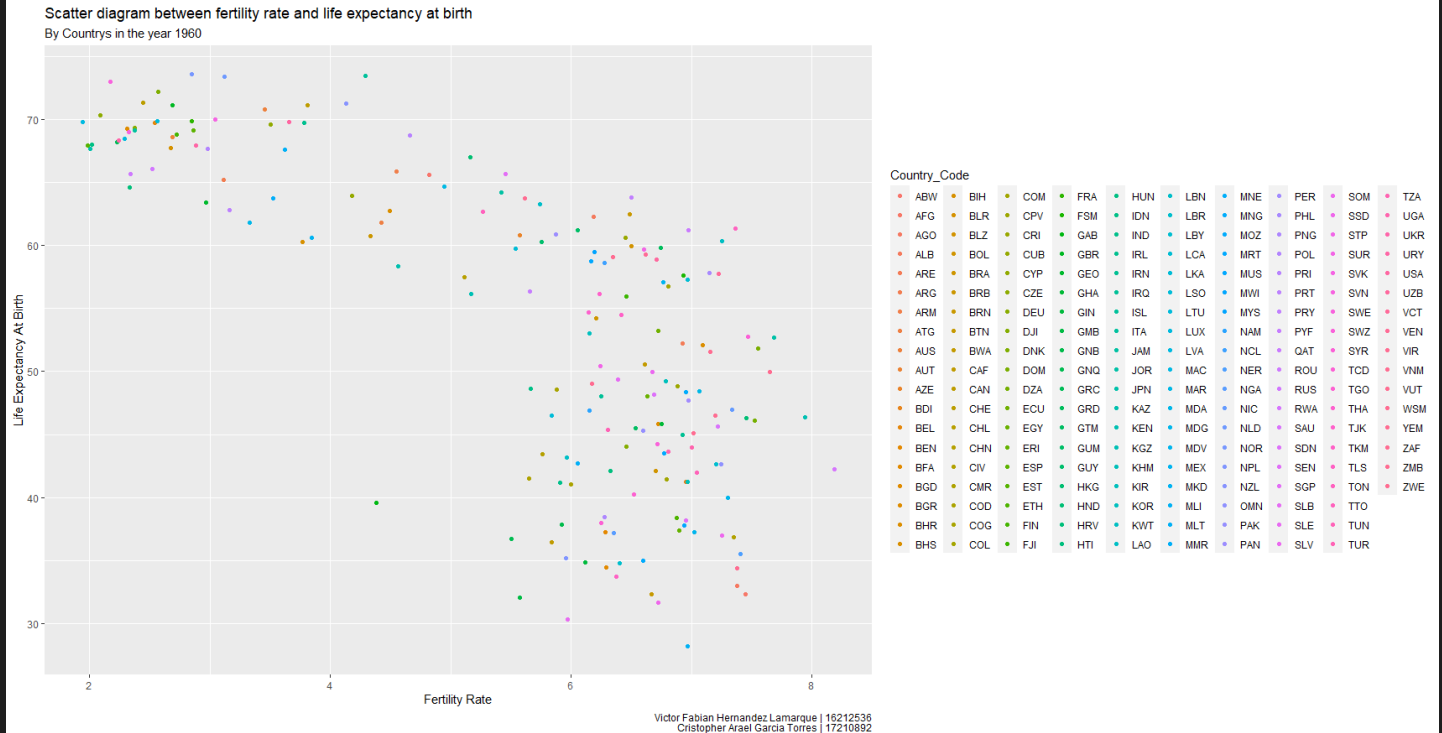
Country_Code

ABW	BIH	COM	FRA	HUN	LBN	MNE	PER	SOM	TZA
AFG	BLR	CPV	FSM	IDN	LBR	MNG	PHL	SSD	UGA
AGO	BLZ	CRI	GAB	IND	LBY	MOZ	PNG	STP	UKR
ALB	BOL	CUB	GBR	IRL	LCA	MRT	POL	SUR	URY
ARE	BRA	CYP	GEO	IRN	LKA	MUS	PRI	SVK	USA
ARG	BRB	CZE	GHA	IRQ	LSO	MWI	PRT	SVN	UZB
ARM	BRN	DEU	GIN	ISL	LTU	MYS	PRY	SWE	VCT
ATG	BTN	DJI	GMB	ITA	LUX	NAM	PYF	SWZ	VEN
AUS	BWA	DNK	GNB	JAM	LVA	NCL	QAT	SYR	VIR
AUT	CAF	DOM	GNQ	JOR	MAC	NER	ROU	TCD	VNM
AZE	CAN	DZA	GRC	JPN	MAR	NGA	RUS	TGO	VUT
BDI	CHE	ECU	GRD	KAZ	MDA	NIC	RWA	THA	WSM
BEL	CHL	EGY	GTM	KEN	MDG	NLD	SAU	TJK	YEM
BEN	CHN	ERI	GUM	KGZ	MDV	NOR	SDN	TKM	ZAF
BFA	CIV	ESP	GUY	KHM	MEX	NPL	SEN	TLS	ZMB
BGD	CMR	EST	HKG	KIR	MKD	NZL	SGP	TON	ZWE
BGR	COD	ETH	HND	KOR	MLI	OMN	SLB	TTO	
BHR	COG	FIN	HRV	KWT	MLT	PAK	SLE	TUN	
BHS	COL	FJI	HTI	LAO	MMR	PAN	SLV	TUR	

#Le agregamos un poco más de estilo a nuestra gráfica con Labs para que la información sea más atractiva de visualizar

graphic_1960 +

```
labs(title="Scatter diagram between fertility rate and life expectancy at birth",  
      subtitle = "By countries in the year 1960",  
      x="Fertility Rate", y="Life Expectancy At Birth",  
      caption= "Victor Fabian Hernandez Lamarque | 16212536  
Cristopher Arael Garcia Torres | 17210892")
```

```
#*Ratio de fertilidad en el año 1960 por Regiones
```

```
#Reutilizamos nuestro vector y generamos el diagrama pero en vez de que nos muestre en color por país, nos mostrara color por región
```

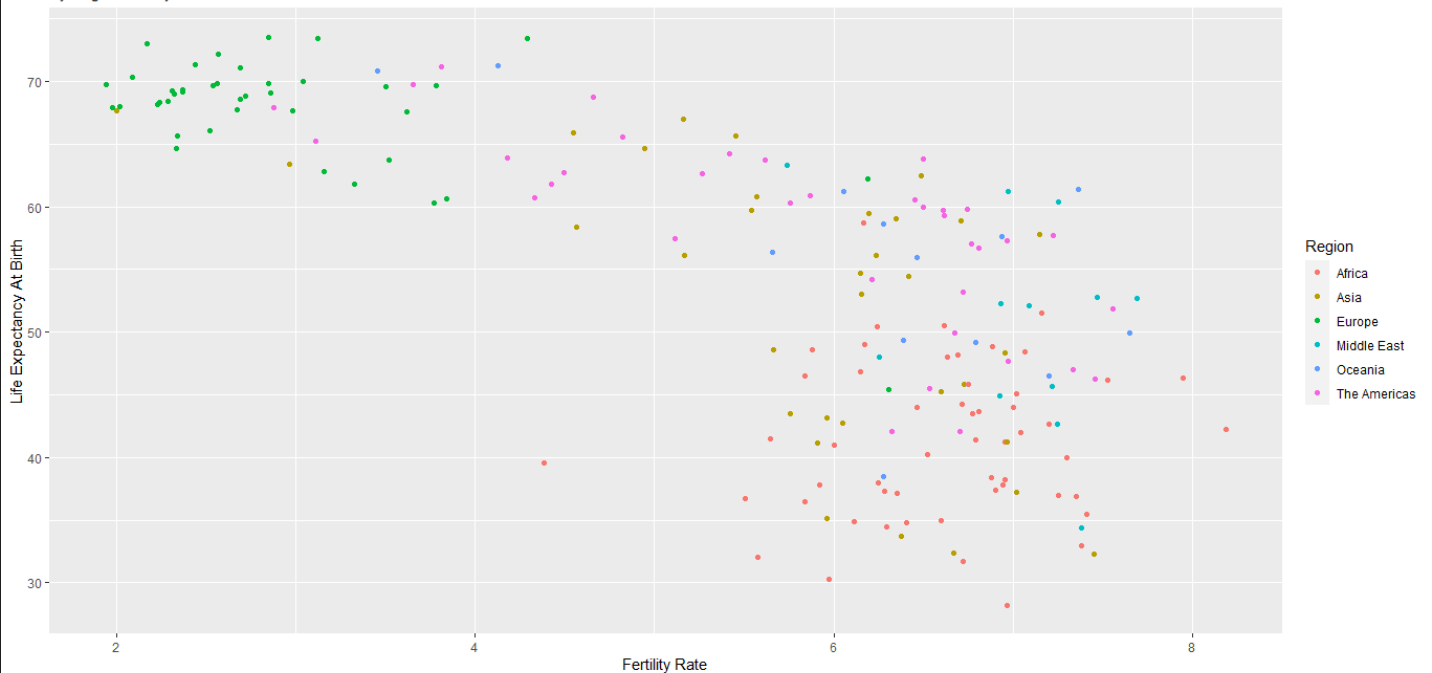
```
graphic_1960<-ggplot(data=stats[Fertility.Rate_1960,]) +  
  aes(x=Fertility.Rate, y=Life_Expectancy_At_Birth_1960, color=Region) +  
  geom_point()
```

```
graphic_1960 +  
  labs(title="Scatter diagram between fertility rate and life expectancy at birth",  
        subtitle = "By Region in the year 1960",  
        x="Fertility Rate", y="Life Expectancy At Birth",  
        caption= "Victor Fabian Hernandez Lamarque | 16212536  
Cristopher Arael Garcia Torres | 17210892")
```



Scatter diagram between fertility rate and life expectancy at birth

By Region in the year 1960



Victor Fabian Hernandez Lamarque | 16212536
Christopher Arael Garcia Torres | 17210892

```
#-----  
#DIAGRAMAS DE DISPERSIÓN EN 2013
```

```
#*Ratio de fertilidad y de esperanza de vida en el año 2013 por países
```

```
#creamos una variable y le asignamos los datos donde el ratio de fertilidad sea del año  
2013 de nuestro DataFrame
```

```
Fertility.Rate_2013<- stats$Year==2013
```

```
#Visualizamos los datos obtenidos en un vector
```

```
stats[Fertility.Rate_2013,]
```

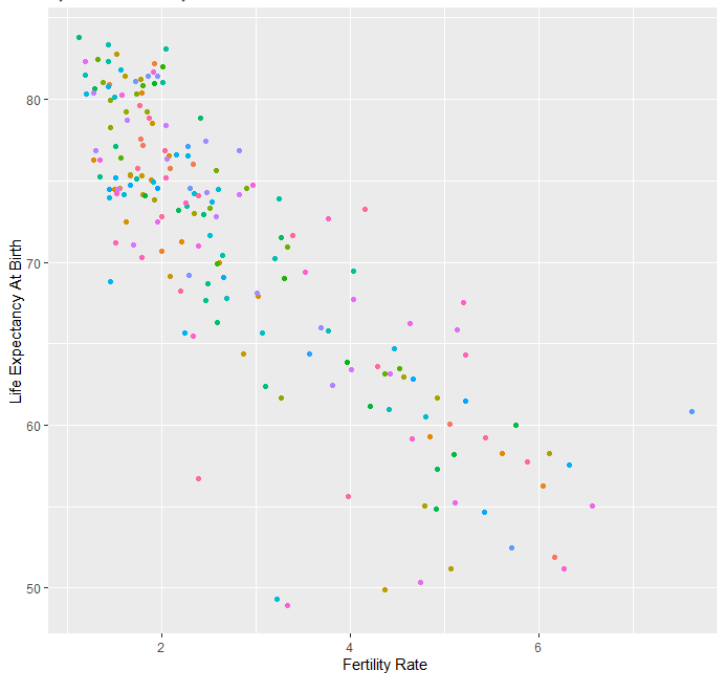
```
R 4.1.1 ~ /
> stats[Fertility.Rate_2013,]
  Country.Name Country.Code Region Year Fertility.Rate
188      Aruba      ABW The Americas 2013      1.6690
189  Afghanistan      AFG      Asia 2013      5.0500
190     Angola      AGO      Africa 2013      6.1650
191    Albania      ALB      Europe 2013      1.7710
192 United Arab Emirates ARE Middle East 2013      1.8010
193    Argentina      ARG The Americas 2013      2.3350
194    Armenia      ARM      Asia 2013      1.5530
195 Antigua and Barbuda ATG The Americas 2013      2.0880
196    Australia      AUS      Oceania 2013      1.9210
197    Austria      AUT      Europe 2013      1.4400
198    Azerbaijan      AZE      Asia 2013      2.0000
199    Burundi      BDI      Africa 2013      6.0350
200    Belgium      BEL      Europe 2013      1.7900
201    Benin      BEN      Africa 2013      4.8460
202 Burkina Faso      BFA      Africa 2013      5.6070
203    Bangladesh      BGD      Asia 2013      2.2090
204    Bulgaria      BGR      Europe 2013      1.5000
205    Bahrain      BHR Middle East 2013      2.0750
206  Bahamas, The      BHS The Americas 2013      1.8830
207 Bosnia and Herzegovina BIH Europe 2013      1.2720
208    Belarus      BLR      Europe 2013      1.6200
209    Belize      BLZ The Americas 2013      2.6110
210    Bolivia      BOL The Americas 2013      3.0170
211    Brazil      BRA The Americas 2013      1.8010
212    Barbados      BRB The Americas 2013      1.7910
213 Brunei Darussalam      BRN      Asia 2013      1.8930
214    Bhutan      BTN      Asia 2013      2.0820
215    Botswana      BWA      Africa 2013      2.8640
216 Central African Republic CAF Africa 2013      4.3680
217    Canada      CAN The Americas 2013      1.6100
218    Switzerland      CHE      Europe 2013      1.5200
219    Chile      CHL The Americas 2013      1.7740
220    China      CHN      Asia 2013      1.6680
221 Cote d'Ivoire      CIV      Africa 2013      5.0630
222    Cameroon      CMR      Africa 2013      4.7810
223    Congo, Rep.      COG      Africa 2013      4.9190
224    Colombia      COL The Americas 2013      1.9220
225    Comoros      COM      Africa 2013      4.5600
226    Cabo Verde      CPV      Africa 2013      2.3390
227    Costa Rica      CRI The Americas 2013      1.8410
228    Cuba      CUB The Americas 2013      1.6220
229    Cyprus      CYP      Europe 2013      1.4550
230    Czech Republic      CZE      Europe 2013      1.4500
231    Germany      DEU      Europe 2013      1.3800
232    Djibouti      DJI      Africa 2013      3.2620
233    Denmark      DNK      Europe 2013      1.7300
234 Dominican Republic      DOM The Americas 2013      2.5100
```

#Creamos una variable y le asignamos la función ggplot utilizando como datos el vector donde el ratio de fertilidad sea en 2013 en el eje X y donde el eje Y sea la esperanza de vida del año 2013 y así mismo le decimos que nos muestre el color por país

```
graphic_2013<-ggplot(data=stats[Fertility.Rate_2013,]) +
  aes(x=Fertility.Rate, y=Life_Expectancy_At_Birth_2013, color=Country_Code) +
  geom_point()
```

```
graphic_2013 +
  labs(title="Scatter diagram between fertility rate and life expectancy at birth",
        subtitle = "By Countries in the year 2013",
        x="Fertility Rate", y="Life Expectancy At Birth",
        caption= "Victor Fabian Hernandez Lamarque | 16212536
Cristopher Arael Garcia Torres | 17210892")
```

Scatter diagram between fertility rate and life expectancy at birth
By Countries in the year 2013



Country_Code

ABW	BIH	COM	FRA	HUN	LBN	MNE	PER	SOM	TZA
AFG	BLR	CPV	FSM	IDN	LBR	MNG	PHL	SSD	UGA
AGO	BLZ	CRI	GAB	IND	LBY	MOZ	PNG	STP	UKR
ALB	BOL	CUB	GBR	IRL	LCA	MRT	POL	SUR	URY
ARE	BRA	CYP	GEO	IRN	LKA	MUS	PRI	SVK	USA
ARG	BRB	CZE	GHA	IRQ	LSO	MWI	PRT	SVN	UZB
ARM	BRN	DEU	GIN	ISL	LTU	MYS	PRY	SWE	VCT
ATG	BTN	DJI	GMB	ITA	LUX	NAM	PYF	SWZ	VEN
AUS	BWA	DNK	GNB	JAM	LVA	NCL	QAT	SYR	VIR
AUT	CAF	DOM	GNQ	JOR	MAC	NER	ROU	TCD	VNM
AZE	CAN	DZA	GRC	JPN	MAR	NGA	RUS	TGO	VUT
BDI	CHE	ECU	GRD	KAZ	MDA	NIC	RWA	THA	WSM
BEL	CHL	EGY	GTM	KEN	MDG	NLD	SAU	TJK	YEM
BEN	CHN	ERI	GUM	KGZ	MDV	NOR	SDN	TKM	ZAF
BFA	CIV	ESP	GUY	KHM	MEX	NPL	SEN	TLS	ZMB
BGD	CMR	EST	HKG	KIR	MKD	NZL	SGP	TON	ZWE
BGR	COD	ETH	HND	KOR	MLI	OMN	SLB	TTO	
BHR	COG	FIN	HRV	KWT	MLT	PAK	SLE	TUN	
BHS	COL	FJI	HTI	LAO	MMR	PAN	SLV	TUR	

Victor Fabian Hernandez Lamarque | 16212536
Cristopher Arael Garcia Torres | 17210892

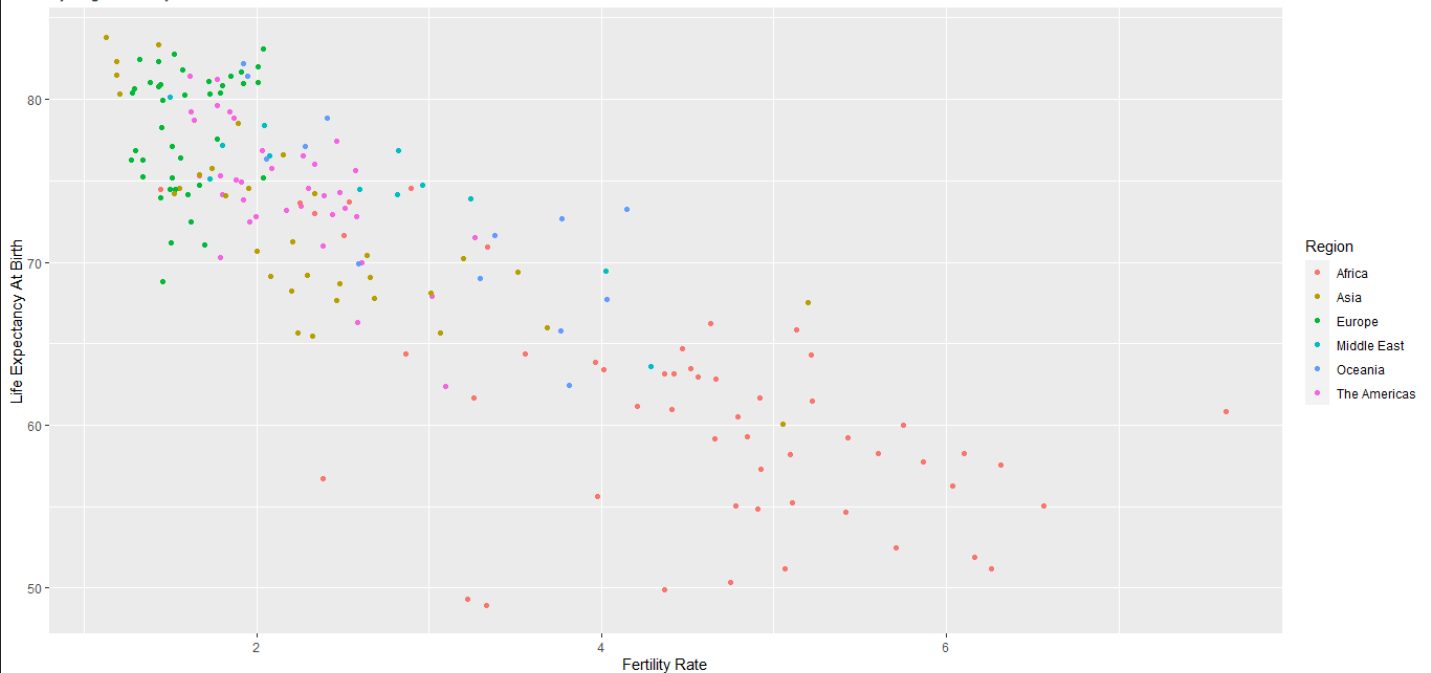
#*Ratio de fertilidad en el año 2013 por Regiones

#Reutilizamos nuestro vector y generamos el diagrama pero en vez de que nos muestre en color por país, nos mostrara color por región

```
graphic_2013<-ggplot(data=stats[Fertility.Rate_2013,]) +
  aes(x=Fertility.Rate, y=Life_Expectancy_At_Birth_2013, color=Region) +
  geom_point()
```

```
graphic_2013 +
  labs(title="Scatter diagram between fertility rate and life expectancy at birth",
        subtitle = "By Region in the year 2013",
        x="Fertility Rate", y="Life Expectancy At Birth",
        caption= "Victor Fabian Hernandez Lamarque | 16212536
Cristopher Arael Garcia Torres | 17210892")
```

Scatter diagram between fertility rate and life expectancy at birth
By Region in the year 2013



Victor Fabian Hernandez Lamarque | 16212536
Christopher Arael Garcia Torres | 17210892

Análisis:

2013: La esperanza de vida en 2013, es principalmente mayor en Asia y en Europa, en África es menor, la tasa de esperanza de vida es mucho menor en los países africanos, casi todo se concentra en las edades menores de 60 años, pero tienen una mayor tasa de fecundidad. que en otras regiones.

1960: En 1960 la esperanza de vida más larga se registró principalmente en Europa, así como en Asia, siendo las dos regiones con mayor esperanza de vida. África es la región con mayor tasa de fecundidad, pero con poca esperanza de vida. América, manteniendo su tasa de esperanza de vida promedio entre 50 y 60 años.

Análisis comparativo:

En comparación de los años 1960 a 2013, se mantuvieron con una mayor tasa de esperanza de vida, Asia y Europa. África se mantiene con la tasa de esperanza de vida más baja, a pesar de los años que han pasado, así como su fecundidad es alta en ambos períodos de años.

La tasa de fecundidad, en 1960 regiones como África, Asia, Oriente Medio y Oceanía es muy alta, iba de 5 a 8 hijos por familia, mientras que en Europa tenían una tasa de fecundidad en un rango de 2 a 4 niños por familia, mientras que en Estados Unidos el rango es de 3 a 8 niños por familia. En 2013 la tasa de fecundidad bajó



considerablemente, regiones como Europa, la tasa se mantiene entre 1 a 2 hijos por familia, mientras que en África está en un rango de 2 a 7 hijos por familia, y el resto de regiones se mantiene en 1 a 4 hijos por familia.

Conclusión: Podemos observar que gracias a este tipo de softwares es posible hacer cálculos matemáticos complejos y funcionales, datos a gran escala nos pueden mostrar patrones los cuales no debemos ignorar pues gracias a el estudio de estas herramientas y escenarios se tiene conocimiento del comportamiento dado por una gran cantidad de información.