

## LOS INDICES DEL MUNDO

Por: Estrella Delcurso

Introducción

Aquí les presento mi investigación sobre diversos índices sociales en el mundo.

Los índices los conseguí de wikipedia, espero que les gusten mucho.

Exploración Univariada

En esta sección exploro cada índice.

```
> # carga de datos
> filename="indexes.csv"
> dataidx=read.csv(filename, stringsAsFactors = T)
```

Este es el comportamiento de la democracia en el mundo, veamos primero las frecuencias absolutas:

```
> demoTable=table(dataidx$Democracy)
> demoTable
```

|            |       |        |             |
|------------|-------|--------|-------------|
| 1 very bad | 2 bad | 4 good | 5 very good |
| 50         | 40    | 77     | 19          |

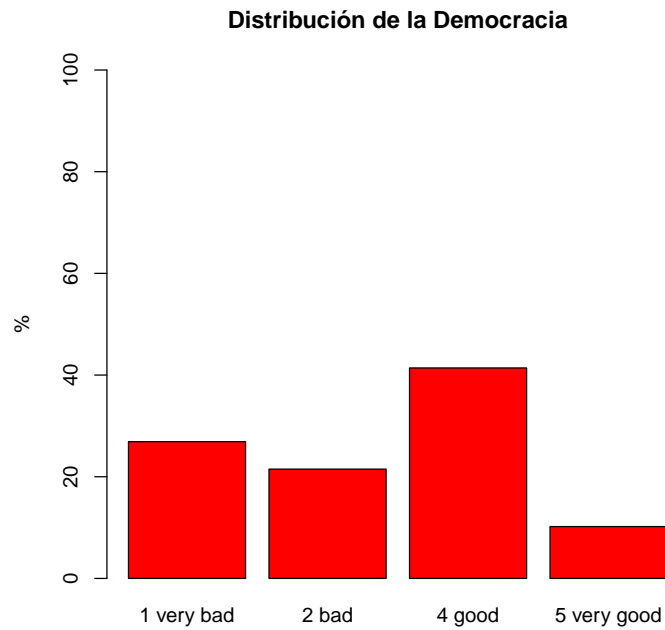
Ahora las frecuencias relativas:

```
> demoTableRel=round(prop.table(demoTable)*100,1)
> demoTableRel
```

|            |       |        |             |
|------------|-------|--------|-------------|
| 1 very bad | 2 bad | 4 good | 5 very good |
| 26.9       | 21.5  | 41.4   | 10.2        |

Y aquí el plot que representa esta distribución

```
> title='Distribución de la Democracia'
> paleta='red'
> barplot(demoTableRel,main=title,
+         col=paleta,ylim = c(0,100),
+         ylab = "%")
>
```



La Libertad económica en el mundo en una tabla:

```
> ecoTable=table(dataidx$EconomicFreedom)
> ecoTable
```

| 1 very bad | 2 bad | 3 middle | 4 good | 5 very good |
|------------|-------|----------|--------|-------------|
| 18         | 65    | 71       | 26     | 6           |

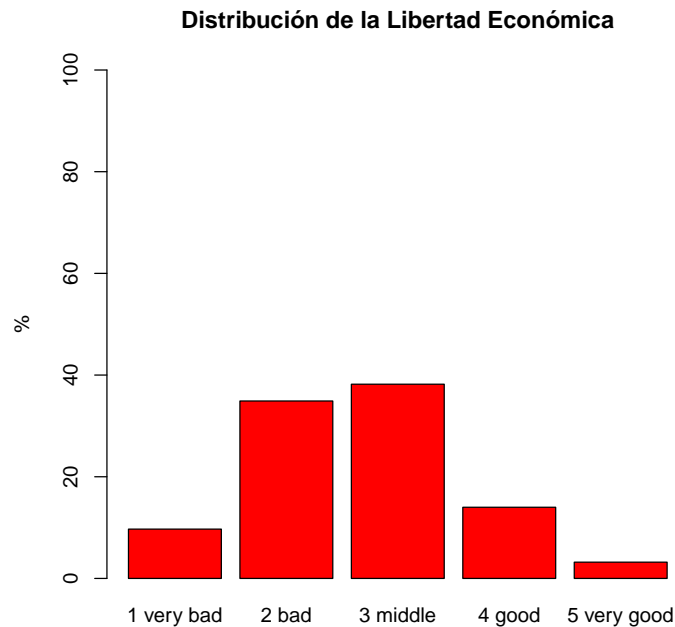
Ahora las frecuencias relativas:

```
> ecoTableRel=round(prop.table(ecoTable)*100,1)
> ecoTableRel
```

| 1 very bad | 2 bad | 3 middle | 4 good | 5 very good |
|------------|-------|----------|--------|-------------|
| 9.7        | 34.9  | 38.2     | 14.0   | 3.2         |

Y aquí el plot que representa esta distribución

```
> title='Distribución de la Libertad Económica'
> paleta='red'
> barplot(ecoTableRel,main=title,
+         col=paleta,ylim = c(0,100),
+         ylab = "%")
>
```



La Libertad general en el mundo en una tabla:

```
> worldTable=table(dataidx$WorldFreedom)
> worldTable
```

|            |          |             |
|------------|----------|-------------|
| 1 very bad | 3 middle | 5 very good |
| 46         | 56       | 84          |

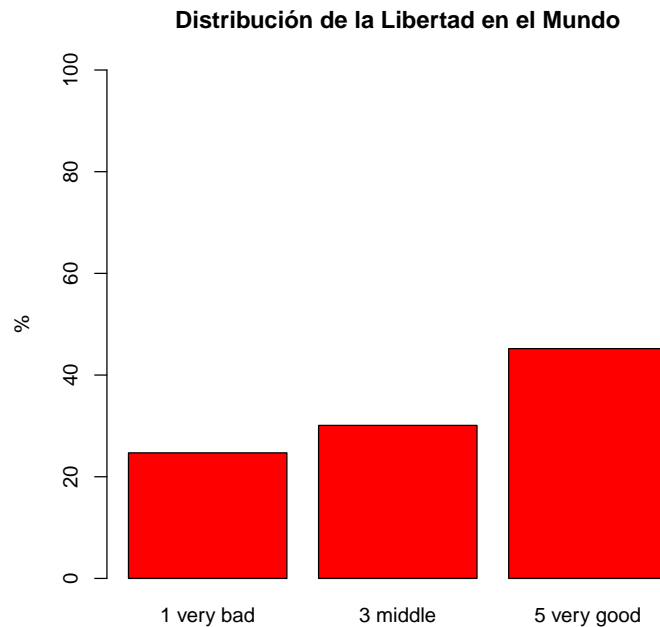
Ahora las frecuencias relativas:

```
> worldTableRel=round(prop.table(worldTable)*100,1)
> worldTableRel
```

|            |          |             |
|------------|----------|-------------|
| 1 very bad | 3 middle | 5 very good |
| 24.7       | 30.1     | 45.2        |

Y aquí el plot que representa esta distribución

```
> title='Distribución de la Libertad en el Mundo'
> paleta='red'
> barplot(worldTableRel,main=title,
+         col=paleta,ylim = c(0,100),
+         ylab = "%")
```



La Libertad de prensa en el mundo en una tabla:

```
> pressTable=table(dataidx$PressFreedom)
> pressTable
```

| 1 very bad | 2 bad | 3 middle | 4 good | 5 very good |
|------------|-------|----------|--------|-------------|
| 20         | 44    | 60       | 45     | 17          |

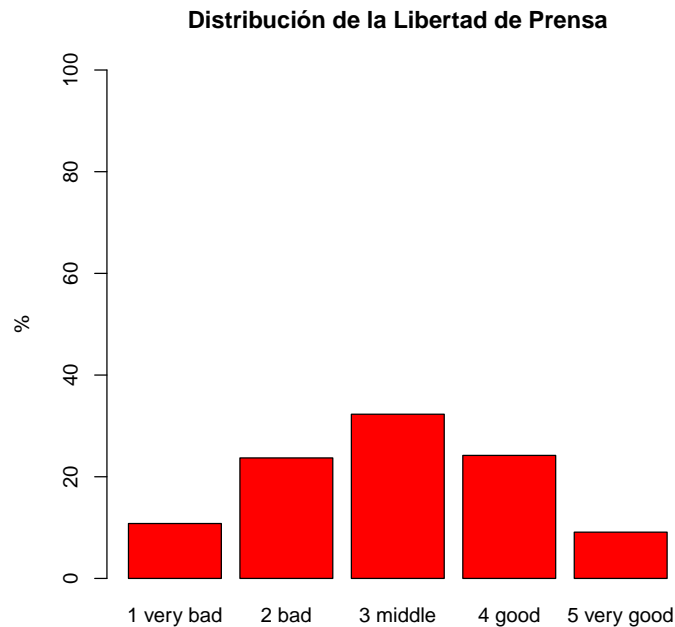
Ahora las frecuencias relativas:

```
> pressTableRel=round(prop.table(pressTable)*100,1)
> pressTableRel
```

| 1 very bad | 2 bad | 3 middle | 4 good | 5 very good |
|------------|-------|----------|--------|-------------|
| 10.8       | 23.7  | 32.3     | 24.2   | 9.1         |

Y aquí el plot que representa esta distribución

```
> title='Distribución de la Libertad de Prensa'
> paleta='red'
> barplot(pressTableRel,main=title,
+         col=paleta,ylim = c(0,100),
+         ylab = "%")
```



Podemos mostrar los estadísticos de cada variable:

```
> summary(dataidx[,-1])
```

|                |                   |                        |                   |
|----------------|-------------------|------------------------|-------------------|
| gdp            | FreedomintheWorld | IndexofEconomicFreedom | PressFreedomIndex |
| Min. : 700     | Min. :1.000       | Min. :1.000            | Min. :1.000       |
| 1st Qu.: 4525  | 1st Qu.:3.000     | 1st Qu.:2.000          | 1st Qu.:2.000     |
| Median : 13000 | Median :3.000     | Median :3.000          | Median :3.000     |
| Mean : 21667   | Mean :3.409       | Mean :2.661            | Mean :2.973       |
| 3rd Qu.: 29200 | 3rd Qu.:5.000     | 3rd Qu.:3.000          | 3rd Qu.:4.000     |
| Max. :139100   | Max. :5.000       | Max. :5.000            | Max. :5.000       |

|                |                |                 |                |
|----------------|----------------|-----------------|----------------|
| DemocracyIndex | WorldFreedom   | EconomicFreedom | PressFreedom   |
| Min. :1.000    | 1 very bad :46 | 1 very bad :18  | 1 very bad :20 |
| 1st Qu.:1.000  | 3 middle :56   | 2 bad :65       | 2 bad :44      |
| Median :4.000  | 5 very good:84 | 3 middle :71    | 3 middle :60   |
| Mean :2.866    |                | 4 good :26      | 4 good :45     |
| 3rd Qu.:4.000  |                | 5 very good: 6  | 5 very good:17 |
| Max. :5.000    |                |                 |                |

|                |
|----------------|
| Democracy      |
| 1 very bad :50 |
| 2 bad :40      |
| 4 good :77     |
| 5 very good:19 |

### Exploración Bivariada

En este trabajo estamos interesados en el impacto de los otros índices en el nivel de Democracia. Veamos las relaciones bivariadas que tiene esta variable con todas las demás:

```
> explanans=names(dataidx)[c(3:6)]
> corrDem=cor(x=dataidx[,2],
+             y=dataidx[,explanans],
+             use = "na.or.complete",
+             method = "spearman")
> corrDem
```

|      | FreedomintheWorld | IndexofEconomicFreedom | PressFreedomIndex | DemocracyIndex |
|------|-------------------|------------------------|-------------------|----------------|
| [1,] | 0.3675636         | 0.655671               | 0.3510658         | 0.4804244      |

Veamos la correlación entre las variables independientes:

```
> corrTable=round(cor(dataidx[explanans],
+                     use = "na.or.complete"),2)
> # ocultar media matriz
> corrTable[upper.tri(corrTable)]<-" "
> as.data.frame(corrTable)
```

|                        | FreedomintheWorld | IndexofEconomicFreedom | PressFreedomIndex | DemocracyIndex |
|------------------------|-------------------|------------------------|-------------------|----------------|
| FreedomintheWorld      | 1                 |                        |                   |                |
| IndexofEconomicFreedom | 0.48              | 1                      |                   |                |
| PressFreedomIndex      | 0.83              |                        | 1                 |                |
| DemocracyIndex         | 0.89              |                        | 0.58              | 1              |

Finalmente, vemos los modelos propuestos. Primero sin el índice de democracia como independiente:

```
> LinRegA = lm(gdp ~ ., data = dataidx[,c(2:5)])
> summary(LinRegA)
```

Call:

```
lm(formula = gdp ~ ., data = dataidx[, c(2:5)])
```

Residuals:

| Min    | 1Q     | Median | 3Q   | Max    |
|--------|--------|--------|------|--------|
| -32063 | -11536 | -3942  | 6648 | 112856 |

Coefficients:

|                        | Estimate | Std. Error | t value | Pr(> t )     |
|------------------------|----------|------------|---------|--------------|
| (Intercept)            | -19595   | 4707       | -4.163  | 4.85e-05 *** |
| FreedomintheWorld      | -2582    | 1579       | -1.635  | 0.104        |
| IndexofEconomicFreedom | 14824    | 1779       | 8.331   | 1.89e-14 *** |
| PressFreedomIndex      | 3570     | 2327       | 1.534   | 0.127        |

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Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 19420 on 182 degrees of freedom  
Multiple R-squared: 0.3554, Adjusted R-squared: 0.3448  
F-statistic: 33.46 on 3 and 182 DF, p-value: < 2.2e-16

>

Luego incluyendo democracia.

```
> LinRegB = lm(gdp ~ ., data = dataidx[,c(2:6)])
> summary(LinRegB)
```

Call:

```
lm(formula = gdp ~ ., data = dataidx[, c(2:6)])
```

Residuals:

| Min    | 1Q     | Median | 3Q   | Max    |
|--------|--------|--------|------|--------|
| -28034 | -12005 | -3782  | 6375 | 113275 |

Coefficients:

|                        | Estimate | Std. Error | t value | Pr(> t )     |
|------------------------|----------|------------|---------|--------------|
| (Intercept)            | -18068   | 4764       | -3.793  | 0.000203 *** |
| FreedomintheWorld      | -5506    | 2306       | -2.388  | 0.017981 *   |
| IndexofEconomicFreedom | 13575    | 1911       | 7.104   | 2.68e-11 *** |
| PressFreedomIndex      | 3571     | 2314       | 1.543   | 0.124564     |
| DemocracyIndex         | 4103     | 2370       | 1.732   | 0.085039 .   |

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Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 19320 on 181 degrees of freedom  
Multiple R-squared: 0.366, Adjusted R-squared: 0.3519  
F-statistic: 26.12 on 4 and 181 DF, p-value: < 2.2e-16