

▼ A4-Regresión Poisson

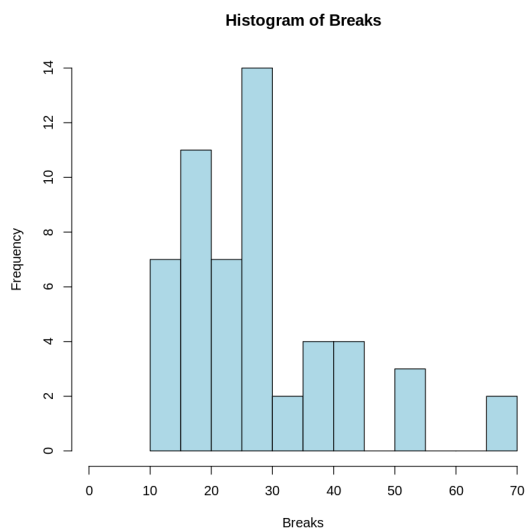
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```
1 data<-warpbreaks
2 head(data,10)
```

```
      A data.frame: 10 × 3
    breaks  wool tension
    <dbl> <fct> <fct>
1      26    A      L
2      30    A      L
3      54    A      L
4      25    A      L
5      70    A      L
6      52    A      L
7      51    A      L
8      26    A      L
9      67    A      L
10     18    A      M
```

▼ 1. Histograma de numero de ropturas

```
1 hist(data$breaks,
2       main = "Histogram of Breaks", # Title for the plot
3       xlab = "Breaks",              # Label for the x-axis
4       ylab = "Frequency",           # Label for the y-axis
5       col = "lightblue",           # Color of the bars
6       border = "black",            # Border color of the bars
7       xlim = c(0, max(data$breaks)), # Set the x-axis limits if needed
8       breaks = 20)                # Number of bins
```



▼ 2. Obtén la media y la varianza

```
1 mean_breaks <- mean(data$breaks)
2 variance_breaks <- var(data$breaks)
3
4 # Print the results
```

```
5 cat("Media de breaks", mean_breaks, "\n")
6 cat("Varianza de breaks", variance_breaks, "\n")
```

```
Media de breaks 28.14815
Varianza de breaks 174.2041
```

▼ 3. Ajusta el modelo de regresión Poisson

```
1 poisson.model<-glm(breaks ~ wool + tension, data, family = poisson(link = "log"))
2 summary(poisson.model)
```

```
Call:
glm(formula = breaks ~ wool + tension, family = poisson(link = "log"),
    data = data)
```

Coefficients:

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	3.69196	0.04541	81.302	< 2e-16 ***
woolB	-0.20599	0.05157	-3.994	6.49e-05 ***
tensionM	-0.32132	0.06027	-5.332	9.73e-08 ***
tensionH	-0.51849	0.06396	-8.107	5.21e-16 ***

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

(Dispersion parameter for poisson family taken to be 1)

```
Null deviance: 297.37 on 53 degrees of freedom
Residual deviance: 210.39 on 50 degrees of freedom
AIC: 493.06
```

Number of Fisher Scoring iterations: 4

Si bien la desviación residual es mayor que los grados de libertad, y esto es algo que se busca, esta es muy grande por lo que se puede interpretar que el modelo tiene estimaciones correctas pero los errores estandar son incorrectos. Con esto en cuenta se implementará un modelo cuasi Poisson para mejorar los resultados."

```
1 poisson.model2<-glm(breaks ~ wool + tension, data = data, family = quasipoisson(link = "log"))
2 summary(poisson.model2)
```

```
Call:
glm(formula = breaks ~ wool + tension, family = quasipoisson(link = "log"),
    data = data)
```

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	3.69196	0.09374	39.384	< 2e-16 ***
woolB	-0.20599	0.10646	-1.935	0.058673 .
tensionM	-0.32132	0.12441	-2.583	0.012775 *
tensionH	-0.51849	0.13203	-3.927	0.000264 ***

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

(Dispersion parameter for quasipoisson family taken to be 4.261537)

```
Null deviance: 297.37 on 53 degrees of freedom
Residual deviance: 210.39 on 50 degrees of freedom
AIC: NA
```

Number of Fisher Scoring iterations: 4

