Air Quality

New York Air Quality Measurement

Libera Mastromatteo

University of Padova

Contents

1 Working with Data in R

1.1 Airquality dataset

The airquality dataset is *built-in* R so there is nothing to install or prepare, it is already there as an R object. This data is small compared to environmental data sets.

1.1.1 Details of the airquality dataset

Daily readings of the following air quality values for May 1, 1973 a Tuesday to September 30, 1973.

1.1.1.1 Exploring airquality[1] We can look at the first and last few lines of that airquality tabular data[2].

2 Proviamo a mettere link:

Link **qui**

2.1 Vai con le liste:

- Oggi
- ho
- imparato
- cose

1. Devo
2. Fare
3. Cose

    1. Devo
    2. Fare
    3. Cose

3 Inseriamo delle immagini

[1] prova nota
[2] questa è la mia seconda nota, c'è anche un link qui

Figure 1: Using Markdown code

Figure 2: Using RMarkdown code

4 Inseriamo la bibliografia

Hess and Blairy (2001) riportano che l'inquinamento fa male

Secondo recenti studi (Hess and Blairy 2001), l'inquinamento fa male

5 Inseriamo delle equazioni

Ecco qui una bellissima equazione $3 + 5 = 8$

$$3 + 9 = 12$$

$$Y = mx + q$$

$$\Delta = 1 - \pi$$

$\sqrt{4} = 2$

6 Come inserire cross-referencing

Come si vede in Tabella 1

Table 1: Questo è un dataset con le prime 10 righe

	mpg	cyl	disp	hp	drat	wt	qsec	vs	am	gear	carb
Mazda RX4	21.0	6	160.0	110	3.90	2.620	16.46	0	1	4	4
Mazda RX4 Wag	21.0	6	160.0	110	3.90	2.875	17.02	0	1	4	4
Datsun 710	22.8	4	108.0	93	3.85	2.320	18.61	1	1	4	1
Hornet 4 Drive	21.4	6	258.0	110	3.08	3.215	19.44	1	0	3	1
Hornet Sportabout	18.7	8	360.0	175	3.15	3.440	17.02	0	0	3	2
Valiant	18.1	6	225.0	105	2.76	3.460	20.22	1	0	3	1
Duster 360	14.3	8	360.0	245	3.21	3.570	15.84	0	0	3	4
Merc 240D	24.4	4	146.7	62	3.69	3.190	20.00	1	0	4	2
Merc 230	22.8	4	140.8	95	3.92	3.150	22.90	1	0	4	2
Merc 280	19.2	6	167.6	123	3.92	3.440	18.30	1	0	4	4

Come si vede in Tabella 2

Table 2: Questo è un dataset con le prime 5 righe

	mpg	cyl	disp	hp	drat	wt	qsec	vs	am	gear	carb
Mazda RX4	21.0	6	160	110	3.90	2.620	16.46	0	1	4	4
Mazda RX4 Wag	21.0	6	160	110	3.90	2.875	17.02	0	1	4	4
Datsun 710	22.8	4	108	93	3.85	2.320	18.61	1	1	4	1
Hornet 4 Drive	21.4	6	258	110	3.08	3.215	19.44	1	0	3	1
Hornet Sportabout	18.7	8	360	175	3.15	3.440	17.02	0	0	3	2

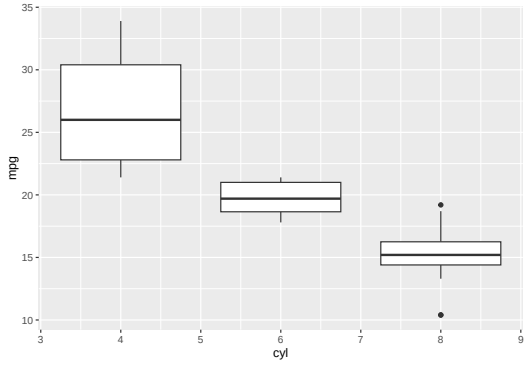
6.1 Inserire cross-referencing per le equazioni richiede scrittura in LateX

$$\bar{X} = \frac{\sum_{i=1}^{n} X_i}{n} \tag{1}$$

Come si evince in (1)

7 Nuovo chunck

```
    Ozone Solar.R Wind Temp Month Day
  1    41     190  7.4   67     5   1
  2    36     118  8.0   72     5   2
  3    12     149 12.6   74     5   3
  4    18     313 11.5   62     5   4
  5    NA      NA 14.3   56     5   5
....
```

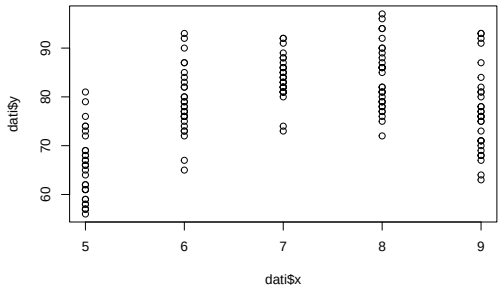


8 Esercitazione

8.1 Summary

```
NA      Ozone           Solar.R          Wind             Temp
NA  Min.   :  1.00   Min.   :  7.0   Min.   : 1.700   Min.   :56.00
NA  1st Qu.: 18.00   1st Qu.:115.8   1st Qu.: 7.400   1st Qu.:72.00
NA  Median : 31.50   Median :205.0   Median : 9.700   Median :79.00
NA  Mean   : 42.13   Mean   :185.9   Mean   : 9.958   Mean   :77.88
NA  3rd Qu.: 63.25   3rd Qu.:258.8   3rd Qu.:11.500   3rd Qu.:85.00
NA  Max.   :168.00   Max.   :334.0   Max.   :20.700   Max.   :97.00
NA  NA's   :37       NA's   :7
NA      Month            Day
NA  Min.   :5.000   Min.   : 1.0
NA  1st Qu.:6.000   1st Qu.: 8.0
NA  Median :7.000   Median :16.0
NA  Mean   :6.993   Mean   :15.8
NA  3rd Qu.:8.000   3rd Qu.:23.0
NA  Max.   :9.000   Max.   :31.0
NA
```

8.2 Plot 1



8.3 Plot 2

```
plot(dati$y ~ dati$x)
```

8.4 First 10 rows

NA	Ozone	Solar.R	Wind	Temp	Month	Day	y	x
NA 1	41	190	7.4	67	5	1	67	5
NA 2	36	118	8.0	72	5	2	72	5
NA 3	12	149	12.6	74	5	3	74	5
NA 4	18	313	11.5	62	5	4	62	5
NA 5	NA	NA	14.3	56	5	5	56	5
NA 6	28	NA	14.9	66	5	6	66	5
NA 7	23	299	8.6	65	5	7	65	5
NA 8	19	99	13.8	59	5	8	59	5
NA 9	8	19	20.1	61	5	9	61	5
NA 10	NA	194	8.6	69	5	10	69	5

....

9 Tabelle

X	Y	Z	W	A	U
1	1	1	NA	C	
B	B	B	S	0	
NA	2	3	3	3	

Tables	Are	Cool	new column
col 1 is	left-aligned	$1600	.
col 2 is	centered	$12	.
col 3 is	right-aligned	$1	.

Tables	Are	Cool
1 is	right-aligned	$1600
2 is	left-aligned	$12
3 is	centered	$1

9.1 Tabelle con codice R

```
##
## Please cite as:

##  Hlavac, Marek (2022). stargazer: Well-Formatted Regression and Summary Statistics Tables.

##  R package version 5.2.3. https://CRAN.R-project.org/package=stargazer
```

Table 6: Tabella di summary

Statistic	N	Mean	St. Dev.	Min	Max
Ozone	116	42.129	32.988	1	168
Solar.R	146	185.932	90.058	7	334
Wind	153	9.958	3.523	1.700	20.700
Temp	153	77.882	9.465	56	97
Month	153	6.993	1.417	5	9
Day	153	15.804	8.865	1	31
y	153	77.882	9.465	56	97
x	153	6.993	1.417	5	9

Table 7: Risultati del modello

	Dependent variable:
	Temp
Constant	58.211***
	(3.519)
Month	2.813***
	(0.493)
Observations	153
R^2	0.177
Adjusted R^2	0.172
Residual Std. Error	8.614 (df = 151)
F Statistic	32.519*** (df = 1; 151)
Note:	*p<0.1; **p<0.05; ***p<0.01

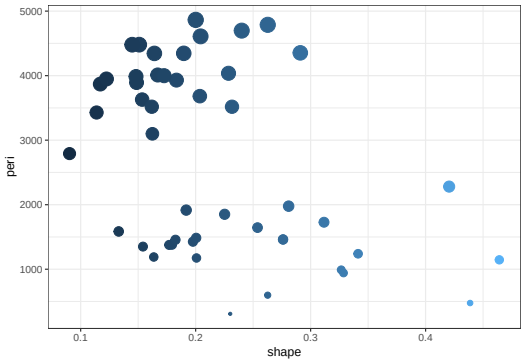
Table 8: Risultati del modello

	Dependent variable:	
	Temp	
	(1)	(2)
Constant	77.882***	58.211***
	(0.765)	(3.519)
Month		2.813***
		(0.493)
Observations	153	153
R^2	0.000	0.177
Adjusted R^2	0.000	0.172
Residual Std. Error	9.465 (df = 152)	8.614 (df = 151)
F Statistic		32.519*** (df = 1; 151)
Note:		*p<0.1; **p<0.05; ***p<0.01

Come si vede in Tabella 8, qui c'è un confronto tra $m0$ e $m1$.

$$x = \frac{-10.8823529}{9.4652697} = -1.149714$$

$$x = \frac{-10.8823529}{9.4652697} = -1.149714$$



Voglio una frase rossa

References

Hess, Ursula, and Sylvie Blairy. 2001. "Facial Mimicry and Emotional Contagion to Dynamic Emotional Facial Expressions and Their Influence on Decoding Accuracy." *International Journal of Psychophysiology* 40 (2): 129–41.