# My Report

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2024-09-15

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## **Statistical Thinking**

Reference: https://www.fharrell.com/post/rflow/

# **Summary Staistic**

```
library(Hmisc)
```

```
Attaching package: 'Hmisc'

The following objects are masked from 'package:base':

format.pval, units
```

```
library(palmerpenguins)
latex(describe(penguins_raw), file = "", caption.placement = "top")
```

### penguins\_raw 17 Variables 344 Observations

studyName | missing 0 distinct 3 n 344 Value Frequency PAL0708 PAL0809 PAL0910 110 114 120 Proportion 0.320 0.331 0.349 Sample Number .10 12.00 Info Mean Gmd .50 .75 58.00 95.25 .90 121.00 n 344 .25 29.00 63.15 6.15 lowest: 1 2 3 4 5, highest: 148 149 150 151 152 Species distinct 3 missing 0 344 Adelie Penguin (Pygoscelis adeliae) Chinstrap penguin (Pygoscelis antarctica) Value Frequency 152 0.442 0.198 Proportion Value Gentoo penguin (Pygoscelis papua) Frequency Proportion 0.360 Region missing 0 distinct value 344 Anvers Value Anvers 344 Frequency Proportion Island distinct 3 missing 0 344 Value Biscoe Dream Torgersen Frequency 168 124 0.488 0.360 0.151 Proportion

Stage

missing distinct Adult, 1 Egg Stage

Adult, 1 Egg Stage 344 Value Frequency Proportion

Individual ID

n missing 344 0 distinct 190

lowest: N100A1 N100A2 N10A1 N10A2 N11A1 , highest: N98A2 N99A1 N99A2 N9A1 N9A2

**Clutch Completion** 

n missing distinct 344

No 36 Frequency 36 308 Proportion 0.105 0.895

Date Egg

Gmd .05 .10 328 2007-11-12 2007-11-16

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.....tuatidia.laratintaata.ltil.tidlihidlitilliratiait.a.a.a.a.

lowest: 2007-11-09 2007-11-10 2007-11-11 2007-11-12 2007-11-13 highest: 2009-11-22 2009-11-23 2009-11-25 2009-11-27 2009-12-01

Culmen Length (mm)

distinct Info .05 Mean Gmd 43.92 6.274 35.70 39.23 44.45 48.50 50.80 36.60

lowest : 32.1 33.1 33.5 34 34.1, highest: 55.1 55.8 55.9 58

Culmen Depth (mm)

missing 2 Mean 17.15 Gmd 2.267 distinct Info .25 .50 15.6 17.3 n 342

lowest : 13.1 13.2 13.3 13.4 13.5, highest: 20.7 20.8 21.1 21.2 21.5

Flipper Length (mm)

.05 .10 .25 .50 .75 .90 Info Gmd Mean 197.0 213.0 0.999 16.03 181.0 185.0 190.0 220.9 200.9

. . . . . . من مساملات . . استوادا المساد لا شا الماللة المسلمة الله الدرام

Adult not sampled. Nest never observed with ful

lowest : 172 174 176 178 179, highest: 226 228 229 230 231

Body Mass (g)

n missing distinct Info Mean Gmd .05 .10 .25 .50 .75 .90 .95 342 2 94 1 4202 911.8 3150 3300 3550 4050 4750 5400 5650

lowest : 2700 2850 2900 2925 2975, highest: 5850 5950 6000 6050 6300

Sex

n missing distinct 333 11 2

Value FEMALE MALE Frequency 165 168 Proportion 0.495 0.505

 $\Delta$  15 N (o/oo):

n missing distinct Info Mean Gmd .05 .10 .25 .50 .75 .90 .95 330 14 330 1 8.733 0.6323 7.897 8.047 8.300 8.652 9.172 9.491 9.689

lowest: 7.6322 7.63452 7.63884 7.68528 7.6887, highest: 9.93727 9.98044 10.0202 10.0237 10.0254

 $\Delta$  13 C (o/oo):

n missing distinct Info Mean Gmd .05 .10 .25 .50 .75 .90 .95 331 13 331 1 -25.69 0.9093 -26.79 -26.69 -26.32 -25.83 -25.06 -24.53 -24.36

lowest : -27.0185 -26.9547 -26.8964 -26.8648 -26.8635, highest: -24.1657 -24.1026 -23.9031 -23.8902 -23.7877

Comments

n missing distinct 54 290 10

lowest : Adult not sampled.

highest: No blood sample obtained. No delta15N data received from lab.

中文

#### Table 1

```
library(table1)
str(penguins_raw)
```

```
tibble [344 x 17] (S3: tbl_df/tbl/data.frame)
                    : chr [1:344] "PAL0708" "PAL0708" "PAL0708" "PAL0708" ...
$ studyName
$ Sample Number
                     : num [1:344] 1 2 3 4 5 6 7 8 9 10 ...
 $ Species
                     : chr [1:344] "Adelie Penguin (Pygoscelis adeliae)" "Adelie Penguin (P
                     : chr [1:344] "Anvers" "Anvers" "Anvers" "Anvers" ...
 $ Region
$ Island
                     : chr [1:344] "Torgersen" "Torgersen" "Torgersen" "Torgersen" ...
                     : chr [1:344] "Adult, 1 Egg Stage" "Adult, 1 Egg Stage" "Adult, 1 Egg Stage"
 $ Stage
$ Individual ID
                     : chr [1:344] "N1A1" "N1A2" "N2A1" "N2A2" ...
$ Clutch Completion : chr [1:344] "Yes" "Yes" "Yes" "Yes" ...
 $ Date Egg
                     : Date[1:344], format: "2007-11-11" "2007-11-11" ...
$ Culmen Length (mm): num [1:344] 39.1 39.5 40.3 NA 36.7 39.3 38.9 39.2 34.1 42 ...
 $ Culmen Depth (mm) : num [1:344] 18.7 17.4 18 NA 19.3 20.6 17.8 19.6 18.1 20.2 ...
$ Flipper Length (mm): num [1:344] 181 186 195 NA 193 190 181 195 193 190 ...
                     : num [1:344] 3750 3800 3250 NA 3450 ...
$ Body Mass (g)
                     : chr [1:344] "MALE" "FEMALE" "FEMALE" NA ...
$ Sex
 $ Delta 15 N (o/oo) : num [1:344] NA 8.95 8.37 NA 8.77 ...
 $ Delta 13 C (o/oo) : num [1:344] NA -24.7 -25.3 NA -25.3 ...
 $ Comments
                     : chr [1:344] "Not enough blood for isotopes." NA NA "Adult not sample
 - attr(*, "spec")=List of 3
  ..$ cols :List of 17
  .. ..$ studyName
                      : list()
  ..... attr(*, "class")= chr [1:2] "collector_character" "collector"
  .... $ Sample Number
                         : list()
  ..... attr(*, "class")= chr [1:2] "collector_double" "collector"
  .. ..$ Species
                           : list()
  ..... attr(*, "class")= chr [1:2] "collector_character" "collector"
  .. ..$ Region
                           : list()
  ..... attr(*, "class")= chr [1:2] "collector_character" "collector"
  .. ..$ Island
                           : list()
  .. .. - attr(*, "class")= chr [1:2] "collector_character" "collector"
                           : list()
  .. ..$ Stage
  .. .. - attr(*, "class")= chr [1:2] "collector_character" "collector"
  .. ..$ Individual ID
                         : list()
  ..... attr(*, "class")= chr [1:2] "collector_character" "collector"
  .... $ Clutch Completion : list()
  ..... attr(*, "class")= chr [1:2] "collector_character" "collector"
```

```
:List of 1
.. ..$ Date Egg
.. ... $\format: \chr \""
..... attr(*, "class")= chr [1:2] "collector_date" "collector"
....$ Culmen Length (mm) : list()
..... attr(*, "class")= chr [1:2] "collector_double" "collector"
.. ..$ Culmen Depth (mm) : list()
.. .. - attr(*, "class")= chr [1:2] "collector_double" "collector"
.... $ Flipper Length (mm): list()
.. .. - attr(*, "class")= chr [1:2] "collector_double" "collector"
.. ..$ Body Mass (g)
                    : list()
..... attr(*, "class")= chr [1:2] "collector_double" "collector"
.. ..$ Sex
                        : list()
..... attr(*, "class")= chr [1:2] "collector_character" "collector"
.. ..$ Delta 15 N (o/oo) : list()
..... attr(*, "class")= chr [1:2] "collector_double" "collector"
.. ..$ Delta 13 C (o/oo) : list()
..... attr(*, "class")= chr [1:2] "collector_double" "collector"
...$ Comments
                       : list()
..... attr(*, "class")= chr [1:2] "collector_character" "collector"
..$ default: list()
... - attr(*, "class")= chr [1:2] "collector_guess" "collector"
..$ skip : num 1
..- attr(*, "class")= chr "col_spec"
```

penguin <- penguins_raw	
<pre>penguin\$Species&lt;- as.factor(penguin\$Species)</pre>	
table1(~ `Body Mass (g)`+`Flipper Length (mm)`  Species, data=penguin)	

	Adelie Penguin (Pygoscelis adeliae)	Chinstrap penguin (Pygoscelis antarctica)	Gentoo penguin (Pygoscelis papua)	Overall
	(N=152)	(N=68)	(N=124)	(N=344)
Body Mass (g)	- /	(,	,	,
Mean (SD)	3700 (459)	3730 (384)	5080 (504)	4200 (802)
Median [Min, Max]	3700 [2850, 4780]	3700 [2700, 4800]	5000 [3950, 6300]	4050 [2700, 6300]
Missing	1 (0.7%)	0 (0%)	1 (0.8%)	2 (0.6%)

	Adelie Penguin (Pygoscelis adeliae)	Chinstrap penguin (Pygoscelis antarctica)	Gentoo penguin (Pygoscelis papua)	Overall
Flipper Length (mm)				
Mean (SD)	190 (6.54)	196 (7.13)	217 (6.48)	201 (14.1)
Median [Min, Max]	190 [172, 210]	196 [178, 212]	216 [203, 231]	197 [172, 231]
Missing	1 (0.7%)	0 (0%)	1 (0.8%)	2 (0.6%)

# help(table1)

# Missing Values

```
library(Hmisc)
library(DataExplorer)
latex(describe(penguins_raw), file = "", caption.placement = "top")
```

### penguins\_raw 17 Variables 344 Observations

studyName										1	1	
n missing 344 0	distino	at 3										
Value PAL0708 PAL0809 PAL0910 Frequency 110 114 120 Proportion 0.320 0.331 0.349												
Sample Number												
n missing 344 0	distinct 152	Info 1	Mean 63.15	Gmd 46.35	.05 6.15	.10 12.00	.25 29.00	.50 58.00	.75 95.25	.90 121.00	.95 134.85	
lowest: 1 2 3 4 5, highest: 148 149 150 151 152												

Species

n missing distinct 344 0 3

Value Adelie Penguin (Pygoscelis adeliae) Chinstrap penguin (Pygoscelis antarctica)

Frequency 152 68
Proportion 0.442 0.198

Value Gentoo penguin (Pygoscelis papua)
Frequency 124
Proportion 0.360

Region

n missing distinct value 344 0 1 Anvers

Value Anvers Frequency 344 Proportion 1

Island

n missing distinct 344 0 3

 Value
 Biscoe
 Dream Torgersen

 Frequency
 168
 124
 52

 Proportion
 0.488
 0.360
 0.151

Stage

n missing distinct value 344 0 1 Adult, 1 Egg Stage

Value Adult, 1 Egg Stage Frequency 344 Proportion 1

Individual ID

n missing distinct 344 0 190

lowest : N100A1 N100A2 N10A1 N10A2 N11A1 , highest: N98A2 N99A1 N99A2 N9A1 N9A2

**Clutch Completion** 

n missing distinct 344 0 2

Value No Yes Frequency 36 308 Proportion 0.105 0.895 Date Egg

randarahimit.Hahatianaanitation

n missing distinct Info Mean
344 0 50 0.999 2008-11-27
.25 .50 .75 .90 .95
2007-11-28 2008-11-09 2009-11-16 2009-11-22 2009-11-26 Gmd .05 .10 328 2007-11-12 2007-11-16

lowest: 2007-11-09 2007-11-10 2007-11-11 2007-11-12 2007-11-13 highest: 2009-11-22 2009-11-23 2009-11-25 2009-11-27 2009-12-01

Culmen Length (mm)

distinct 164 missing Info Mean Gmd .25 39.23 .75 48.50 342 35.70 36.60 50.80 43.92 6.274

lowest: 32.1 33.1 33.5 34 34.1, highest: 55.1 55.8 55.9 58

Culmen Depth (mm)

missing distinct Info 1 Mean 17.15 Gmd 2.267 .05 13.9 .10 14.3 .50 17.3

lowest: 13.1 13.2 13.3 13.4 13.5, highest: 20.7 20.8 21.1 21.2 21.5

Flipper Length (mm)

Gmd 16.03 .05 181.0 .10 185.0 .25 190.0 .50 197.0 .75 213.0

lowest : 172 174 176 178 179, highest: 226 228 229 230 231

Body Mass (q)

distinct Mean 4202 3150 3300

lowest: 2700 2850 2900 2925 2975, highest: 5850 5950 6000 6050 6300

Sex

n 333 missing 11

Value Frequency FEMALE 165 Proportion 0.495

 $\Delta$  15 N (o/oo):

.05 7.897 distinct missing Info Mean Gmd .50 8.652 8.300 0.6323 330 8.733 8.047

lowest: 7.6322 7.63452 7.63884 7.68528 7.6887, highest: 9.93727 9.98044 10.0202 10.0237 10.0254

#### $\Delta$ 13 C (o/oo):

Mean Gmd -25.69

 $10 west: -27.0185 - 26.9547 - 26.8964 - 26.8648 - 26.8635, \ highest: -24.1657 - 24.1026 - 23.9031 - 23.8902 - 23.7877 - 24.1026 - 23.9031 - 23.8902 - 23.7877 - 24.1026 - 23.9031 - 23.8902 - 23.7877 - 24.1026 - 23.9031 - 23.8902 - 23.7877 - 24.1026 - 23.9031 - 23.8902 - 23.7877 - 24.1026 - 23.9031 - 23.8902 - 23.8902 - 23.7877 - 24.1026 - 23.9031 - 23.8902 - 23.7877 - 24.1026 - 23.9031 - 23.8902 - 23.7877 - 24.1026 - 23.9031 - 23.8902 - 23.7877 - 24.1026 - 23.9031 - 23.8902 - 23.$ 

Comments

distinct 10 n 54 missing 290

lowest : Adult not sampled.

highest: No blood sample obtained.

Adult not sampled. Nest never observed with ful No delta15N data received from lab.

#### plot\_missing(penguins\_raw)

