

HW1

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Data

```
library(palmerpenguins)
```

Warning: package 'palmerpenguins' was built under R version 4.3.3

```
data(package = 'palmerpenguins')  
head(penguins_raw)
```

A tibble: 6 x 17

```
studyName Sample Number Species Region Island Stage Individual ID
1 PAL0708 1 Adelie Penguin ~ Anvers Torge~ Adul~ N1A1
2 PAL0708 2 Adelie Penguin ~ Anvers Torge~ Adul~ N1A2
3 PAL0708 3 Adelie Penguin ~ Anvers Torge~ Adul~ N2A1
4 PAL0708 4 Adelie Penguin ~ Anvers Torge~ Adul~ N2A2
5 PAL0708 5 Adelie Penguin ~ Anvers Torge~ Adul~ N3A1
6 PAL0708 6 Adelie Penguin ~ Anvers Torge~ Adul~ N3A2
# i 10 more variables: Clutch Completion , Date Egg , # Culmen Length (mm) , Culmen
Depth (mm) , # Flipper Length (mm) , Body Mass (g) , Sex , # Delta 15 N (o/oo) , Delta
13 C (o/oo) , Comments
```

```
names(penguins_raw)
```

```
[1] "studyName" "Sample Number" "Species"
[4] "Region" "Island" "Stage"
[7] "Individual ID" "Clutch Completion" "Date Egg"
[10] "Culmen Length (mm)" "Culmen Depth (mm)" "Flipper Length (mm)" [13] "Body Mass
(g)" "Sex" "Delta 15 N (o/oo)"
[16] "Delta 13 C (o/oo)" "Comments"
```

Summary Statistic

```
summary(penguins_raw)
```

studyName	Sample Number	Species	Region
Length:344	Min. : 1.00	Length:344	Length:344
Class :character	1st Qu.: 29.00	Class :character	Class :character
Mode :character	Median : 58.00	Mode :character	Mode :character
	Mean : 63.15		
	3rd Qu.: 95.25		
	Max. :152.00		
Island	Stage	Individual ID	Clutch Completion
Length:344	Length:344	Length:344	Length:344
Class :character	Class :character	Class :character	Class :character
Mode :character	Mode :character	Mode :character	Mode :character

Date Egg	Culmen Length (mm)	Culmen Depth (mm)	Flipper Length (mm)
Min. :2007-11-09	Min. :32.10	Min. :13.10	Min. :172.0
1st Qu.:2007-11-28	1st Qu.:39.23	1st Qu.:15.60	1st Qu.:190.0
Median :2008-11-09	Median :44.45	Median :17.30	Median :197.0
Mean :2008-11-27	Mean :43.92	Mean :17.15	Mean :200.9
3rd Qu.:2009-11-16	3rd Qu.:48.50	3rd Qu.:18.70	3rd Qu.:213.0
Max. :2009-12-01	Max. :59.60	Max. :21.50	Max. :231.0
	NA's :2	NA's :2	NA's :2

Body Mass (g)	Sex	Delta 15 N (o/oo)	Delta 13 C (o/oo)
Min. :2700	Length:344	Min. : 7.632	Min. : -27.02
1st Qu.:3550	Class :character	1st Qu.: 8.300	1st Qu.: -26.32
Median :4050	Mode :character	Median : 8.652	Median : -25.83
Mean :4202		Mean : 8.733	Mean : -25.69
3rd Qu.:4750		3rd Qu.: 9.172	3rd Qu.: -25.06
Max. :6300		Max. :10.025	Max. : -23.79
NA's :2		NA's :14	NA's :13

Comments
 Length:344
 Class :character
 Mode :character

Contingency table

交叉表顯示兩個類別變數之間的聯合分佈

```
library(pander)
```

Warning: package 'pander' was built under R version 4.3.3

```
pander(ftable(penguins_raw$studyName, penguins_raw$Species))
```

Warning in check_digits(digits, "digits", ncol(t)): digits is not equal to ncol(t), reverting to default value

Table 1: Table continues below

	Adelie Penguin (Pygoscelis adeliae)	Chinstrap penguin (Pygoscelis antarctica)
PAL0708	50	26
PAL0809	50	18
PAL0910	52	24

Gentoo penguin (Pygoscelis papua)
34
46
44

```
pander(ftable(penguins_raw$studyName, penguins_raw$Region))
```

	Anvers
PAL0708	110
PAL0809	114
PAL0910	120

```
pander(ftable(penguins_raw$studyName, penguins_raw$Island))
```

	Biscoe	Dream	Torgersen
PAL0708	44	46	20
PAL0809	64	34	16
PAL0910	60	44	16

```
pander(ftable(penguins_raw$studyName, penguins_raw$Stage))
```

	Adult, 1 Egg Stage
PAL0708	110

PAL0809	114
PAL0910	120

```
pander(ftable(penguins_raw$studyName, penguins_raw$`Clutch Completion`))
```

	No	Yes
PAL0708	16	94
PAL0809	10	104
PAL0910	10	110

```
pander(ftable(penguins_raw$studyName, penguins_raw$Sex))
```

	FEMALE	MALE
PAL0708	51	52
PAL0809	56	57
PAL0910	58	59

```
pander(ftable(penguins_raw$Species, penguins_raw$Region))
```

	Anvers
Adelie Penguin (Pygoscelis adeliae)	152
Chinstrap penguin (Pygoscelis antarctica)	68
Gentoo penguin (Pygoscelis papua)	124

```
pander(ftable(penguins_raw$Species, penguins_raw$Island))
```

	Biscoe	Dream	Torgersen
Adelie Penguin (Pygoscelis adeliae)	44	56	52
Chinstrap penguin (Pygoscelis antarctica)	0	68	0
Gentoo penguin (Pygoscelis papua)	124	0	0

```
pander(ftable(penguins_raw$Species, penguins_raw$Stage))
```

	Adult, 1 Egg Stage
Adelie Penguin (Pygoscelis adeliae)	152
Chinstrap penguin (Pygoscelis antarctica)	68
Gentoo penguin (Pygoscelis papua)	124

```
pander(ftable(penguins_raw$Species, penguins_raw$`Clutch Completion`))
```

	No	Yes
Adelie Penguin (Pygoscelis adeliae)	14	138
Chinstrap penguin (Pygoscelis antarctica)	14	54
Gentoo penguin (Pygoscelis papua)	8	116

```
pander(ftable(penguins_raw$Species, penguins_raw$Sex))
```

	FEMALE	MALE
Adelie Penguin (Pygoscelis adeliae)	73	73
Chinstrap penguin (Pygoscelis antarctica)	34	34
Gentoo penguin (Pygoscelis papua)	58	61

```
pander(ftable(penguins_raw$Region, penguins_raw$Island))
```

	Biscoe	Dream	Torgersen
Anvers	168	124	52

```
pander(ftable(penguins_raw$Region, penguins_raw$Stage))
```

	Adult, 1 Egg Stage
Anvers	344

```
pander(ftable(penguins_raw$Region, penguins_raw$`Clutch Completion`))
```

	No	Yes
Anvers	36	308

```
pander(ftable(penguins_raw$Region, penguins_raw$Sex))
```

	FEMALE	MALE
Anvers	165	168

```
pander(ftable(penguins_raw$Island, penguins_raw$Stage))
```

	Adult, 1 Egg Stage
Biscoe	168
Dream	124
Torgersen	52

```
pander(ftable(penguins_raw$Island, penguins_raw$`Clutch Completion`))
```

	No	Yes
Biscoe	10	158
Dream	18	106
Torgersen	8	44

```
pander(ftable(penguins_raw$Island, penguins_raw$Sex))
```

	FEMALE	MALE
Biscoe	80	83
Dream	61	62
Torgersen	24	23

```
pander(ftable(penguins_raw$Stage, penguins_raw$`Clutch Completion`))
```

	No	Yes
Adult, 1 Egg Stage	36	308

```
pander(ftable(penguins_raw$Stage, penguins_raw$Sex))
```

	FEMALE	MALE
Adult, 1 Egg Stage	165	168

```
pander(ftable(penguins_raw$`Clutch Completion`, penguins_raw$Sex))
```

	FEMALE	MALE
No	18	17
Yes	147	151

Missing value

```
library(DataExplorer)
```

Warning: package 'DataExplorer' was built under R version 4.3.3

```
plot_missing(penguins_raw)
```


