MODELLING TOOLS FOR ENVIRONMENTAL SCIENTIFIC STUDIES

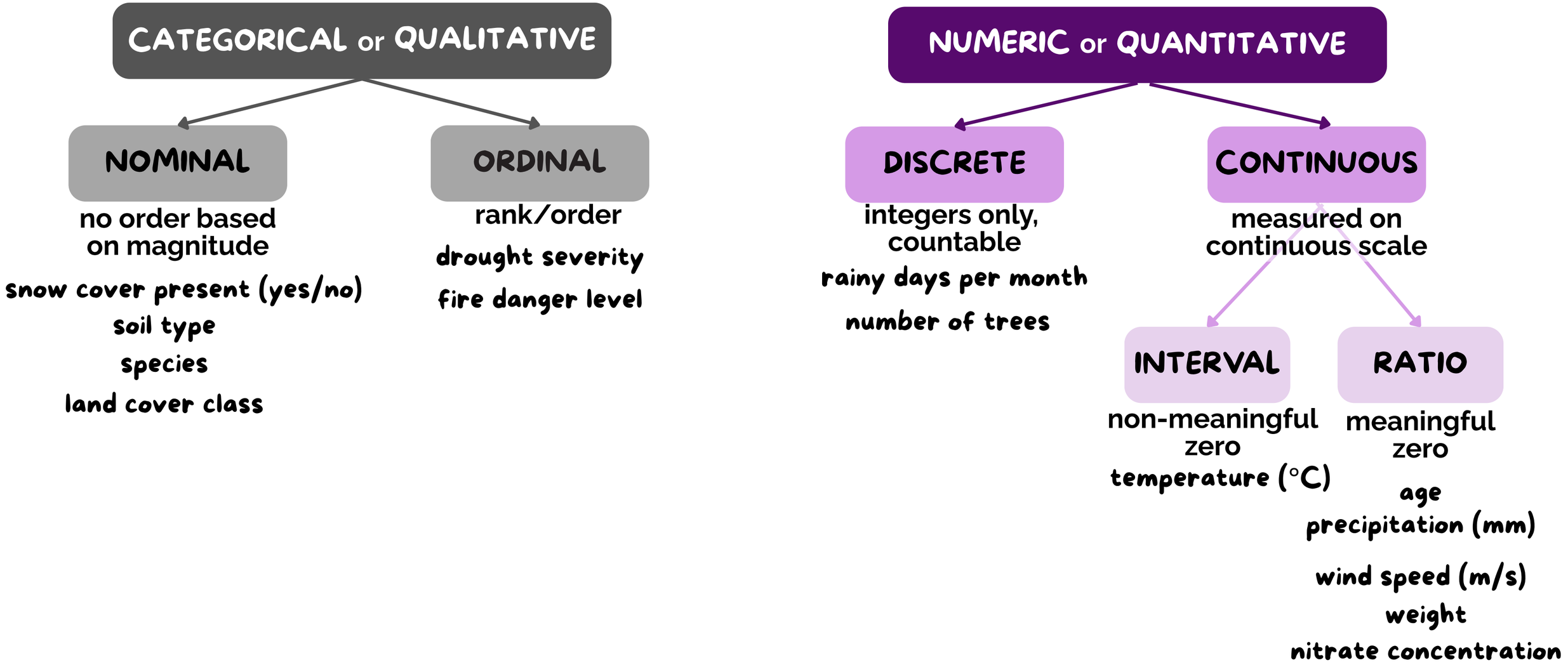
Descriptive Statistics and Exploratory Data Analysis

IDA RAHU

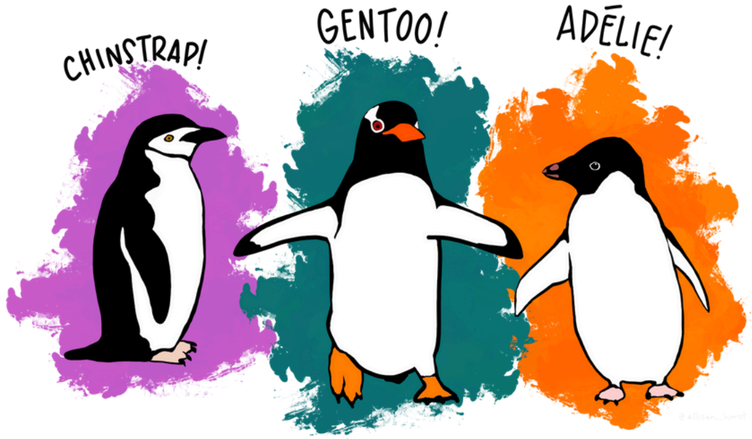
Stockholm 2026

VARIABLES & THEIR TYPES

VARIABLE = RECORDED INFO



CATEGORICAL VARIABLES



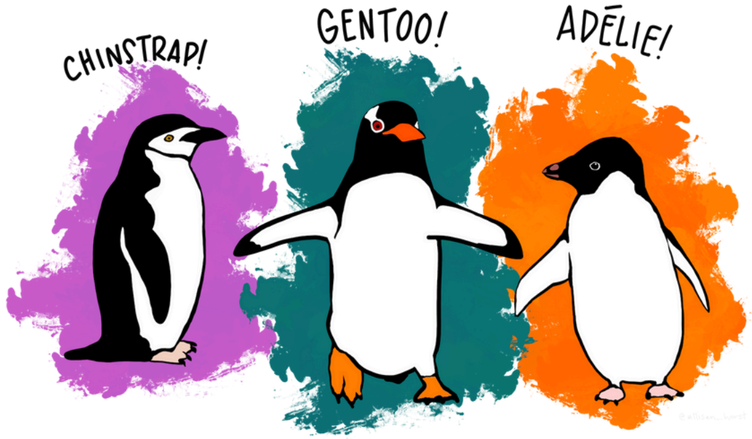
The **palmerpenguins** data contains size measurements for three penguin species observed on three islands in the Palmer Archipelago, Antarctica.

8 variables (n = 344 penguins)

Species	Penguin species (Adélie, Chinstrap, Gentoo)
Island	Island in the Palmer Archipelago where observed
Bill length (mm)	Length of the penguin's bill (mm)
Bill depth (mm)	Depth (thickness) of the penguin's bill (mm)
Flipper length (mm)	Length of the penguin's flipper (mm)
Body mass (g)	Body mass of the penguin (g)
Sex	Male or female (some values missing)
Year	Year of observation (2007–2009)

These data were collected from 2007 - 2009 by Dr. Kristen Gorman with the Palmer Station Long Term Ecological Research Program, part of the US Long Term Ecological Research Network.

CATEGORICAL VARIABLES



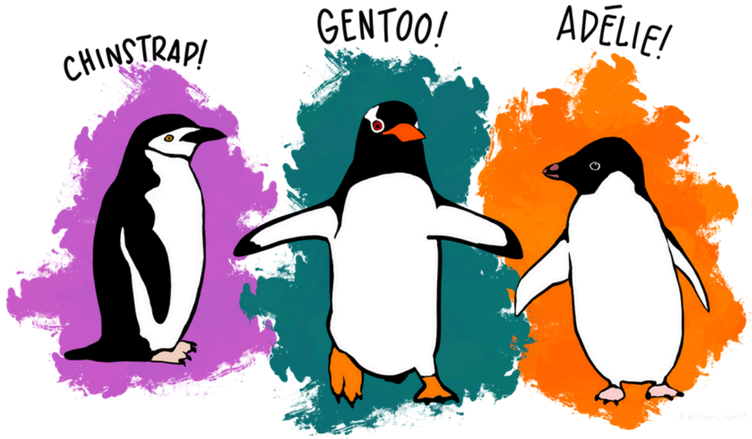
The **palmerpenguins** data contains size measurements for three penguin species observed on three islands in the Palmer Archipelago, Antarctica.

8 variables (n = 344 penguins)

Species	Penguin species (Adélie, Chinstrap, Gentoo)
Island	Island in the Palmer Archipelago where observed
Bill length (mm)	Length of the penguin's bill (mm)
Bill depth (mm)	Depth (thickness) of the penguin's bill (mm)
Flipper length (mm)	Length of the penguin's flipper (mm)
Body mass (g)	Body mass of the penguin (g)
Sex	Male or female (some values missing)
Year	Year of observation (2007–2009)

These data were collected from 2007 - 2009 by Dr. Kristen Gorman with the Palmer Station Long Term Ecological Research Program, part of the US Long Term Ecological Research Network.

CATEGORICAL VARIABLES



The **palmerpenguins** data contains size measurements for three penguin species observed on three islands in the Palmer Archipelago, Antarctica.

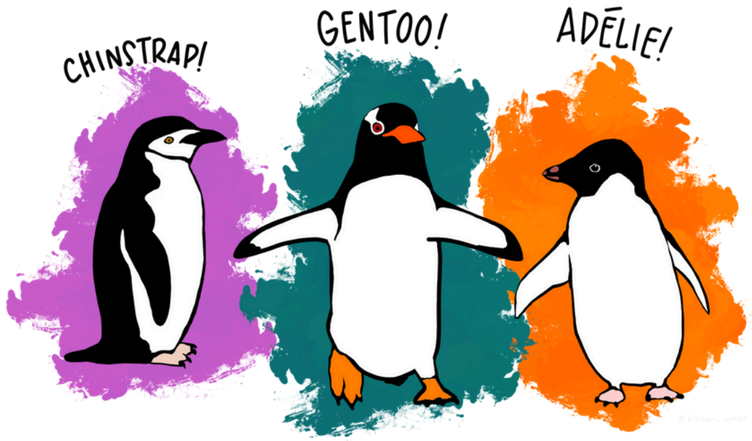
8 variables (n = 344 penguins)

Species	Penguin species
Island	Island in the Palmer
Bill	Length of the
Bill	Depth (thickness) of
Flipper	Length of the
Body	Body mass of the
Sex	Male or female (some
Year	Year of observation

Island	Frequency	Proportion
Biscoe	168	
Dream	124	
Torgersen	52	
TOTAL	**344**	

These data were collected from 2007 - 2009 by Dr. Kristen Gorman with the Palmer Station Long Term Ecological Research Program, part of the US Long Term Ecological Research Network.

CATEGORICAL VARIABLES



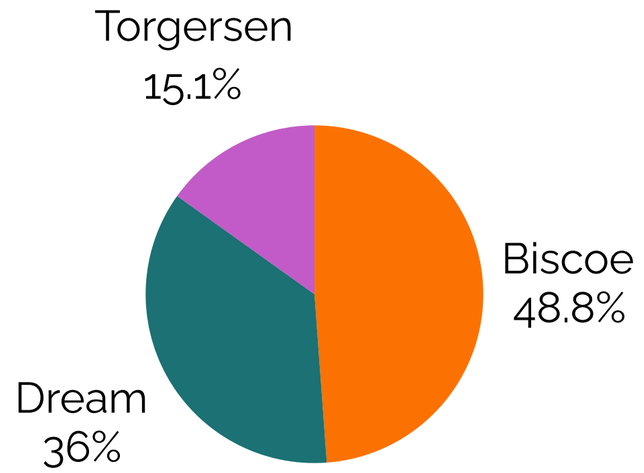
The **palmerpenguins** data contains size measurements for three penguin species observed on three islands in the Palmer Archipelago, Antarctica.

8 variables (n = 344 penguins)

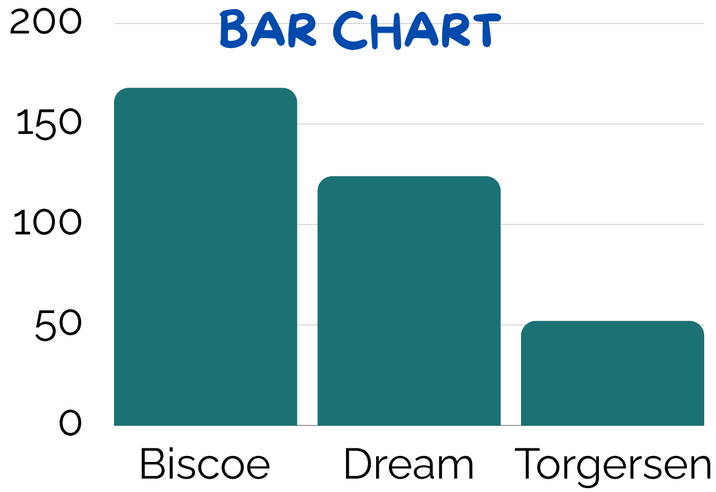
Species	Penguin species
Island	Island in the Palmer
Bill	Length of the
Bill	Depth (thickness) of
Flipper	Length of the
Body	Body mass of the
Sex	Male or female (some
Year	Year of observation

Island	**Frequency**	**Proportion**
Biscoe	168	0.489
Dream	124	0.36
Torgersen	52	0.151
TOTAL	**344**	**1**

PIE CHART

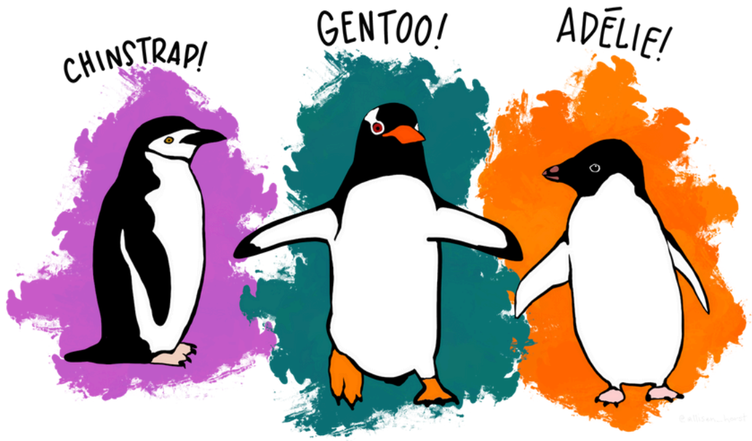


BAR CHART



These data were collected from 2007 - 2009 by Dr. Kristen Gorman with the Palmer Station Long Term Ecological Research Program, part of the US Long Term Ecological Research Network.

CATEGORICAL VARIABLES



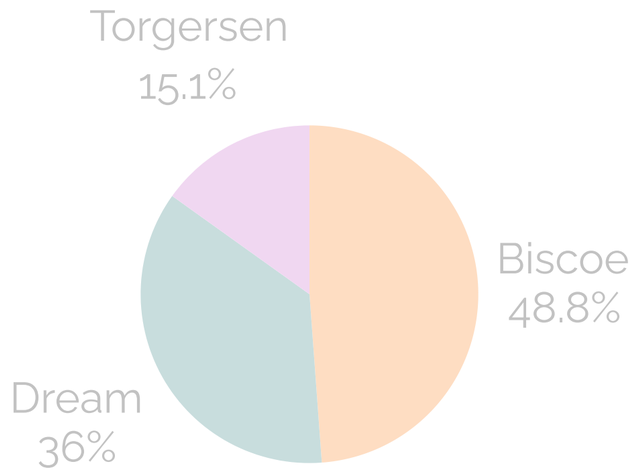
The **palmerpenguins** data contains size measurements for three penguin species observed on three islands in the Palmer Archipelago, Antarctica.

8 variables (n = 344 penguins)

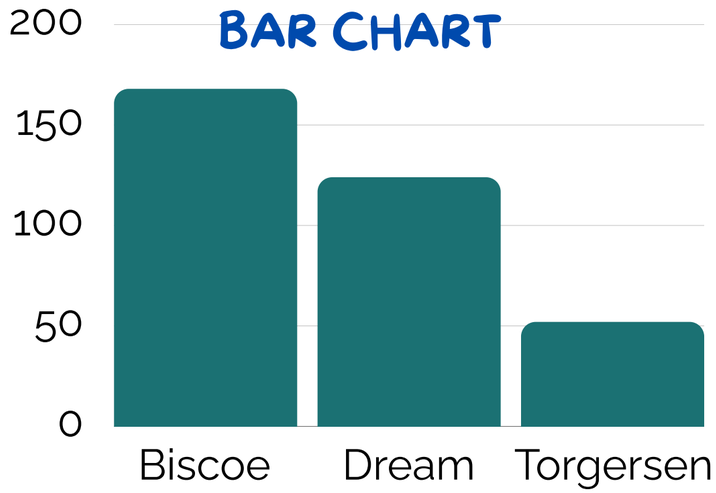
Species	Penguin species
Island	Island in the Palmer
Bill	Length of the
Bill	Depth (thickness) of
Flipper	Length of the
Body	Body mass of the
Sex	Male or female (some
Year	Year of observation

Island	Frequency	Proportion
Biscoe	168	0.489
Dream	124	0.36
Torgersen	52	0.151
TOTAL	**344**	**1**

PIE CHART

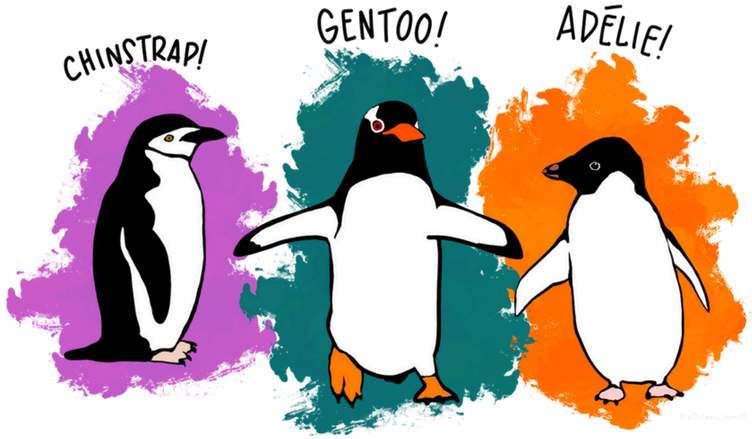


BAR CHART



These data were collected from 2007 - 2009 by Dr. Kristen Gorman with the Palmer Station Long Term Ecological Research Program, part of the US Long Term Ecological Research Network.

NUMERIC VARIABLES



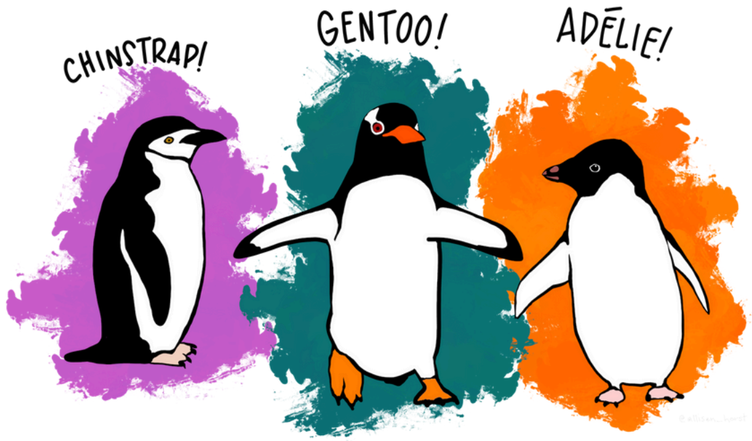
The **palmerpenguins** data contains size measurements for three penguin species observed on three islands in the Palmer Archipelago, Antarctica.

8 variables (n = 344 penguins)

Species	Penguin species (Adélie, Chinstrap, Gentoo)
Island	Island in the Palmer Archipelago where observed
Bill length (mm)	Length of the penguin's bill (mm)
Bill depth (mm)	Depth (thickness) of the penguin's bill (mm)
Flipper length (mm)	Length of the penguin's flipper (mm)
Body mass (g)	Body mass of the penguin (g)
Sex	Male or female (some values missing)
Year	Year of observation (2007–2009)

These data were collected from 2007 - 2009 by Dr. Kristen Gorman with the Palmer Station Long Term Ecological Research Program, part of the US Long Term Ecological Research Network.

NUMERIC VARIABLES



The **palmerpenguins** data contains size measurements for three penguin species observed on three islands in the Palmer Archipelago, Antarctica.

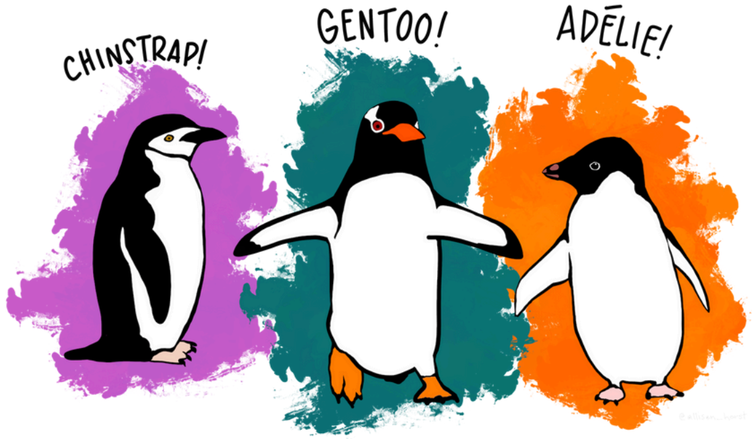
8 variables (n = 344 penguins)

73 male Adelie penguins
min body mass = 3325 g
max body mass = 4775 g

Species	Penguin species (Adélie, Chinstrap, Gentoo)
Island	Island in the Palmer Archipelago where observed
Bill length (mm)	Length of the penguin's bill (mm)
Bill depth (mm)	Depth (thickness) of the penguin's bill (mm)
Flipper length (mm)	Length of the penguin's flipper (mm)
Body mass (g)	Body mass of the penguin (g)
Sex	Male or female (some values missing)
Year	Year of observation (2007–2009)

These data were collected from 2007 - 2009 by Dr. Kristen Gorman with the Palmer Station Long Term Ecological Research Program, part of the US Long Term Ecological Research Network.

NUMERIC VARIABLES



The **palmerpenguins** data contains size measurements for three penguin species observed on three islands in the Palmer Archipelago, Antarctica.

8 variables (n = 344 penguins)

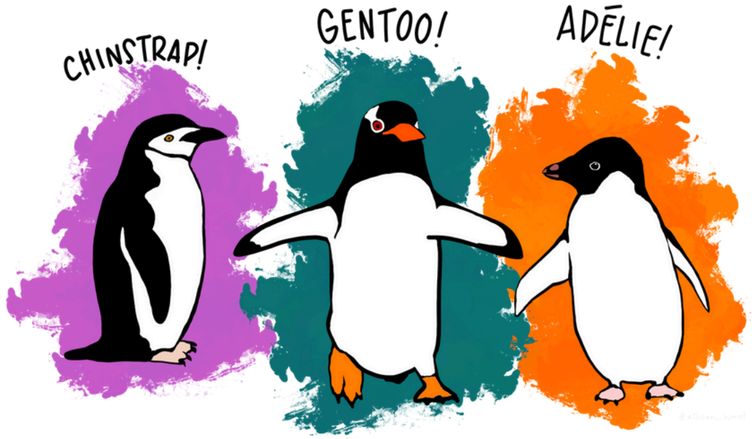
73 male Adelie penguins
min body mass = 3325 g
max body mass = 4775 g

Speci	Penguin
Island	Island in the
Bill	Length of the
Bill	Depth
Flippe	Length of the
Body	Body mass of
Sex	Male or
Year	Year of

Body mass (g)	Frequency	Proportion
[3325...3615)	9	
[3615...3905)	20	
[3905..4195)	18	
[4195...4485)	18	
[4485...4775)	8	
TOTAL	**73**	

These data were collected from 2007 - 2009 by Dr. Kristen Gorman with the Palmer Station Long Term Ecological Research Program, part of the US Long Term Ecological Research Network.

NUMERIC VARIABLES



The **palmerpenguins** data contains size measurements for three penguin species observed on three islands in the Palmer Archipelago, Antarctica.

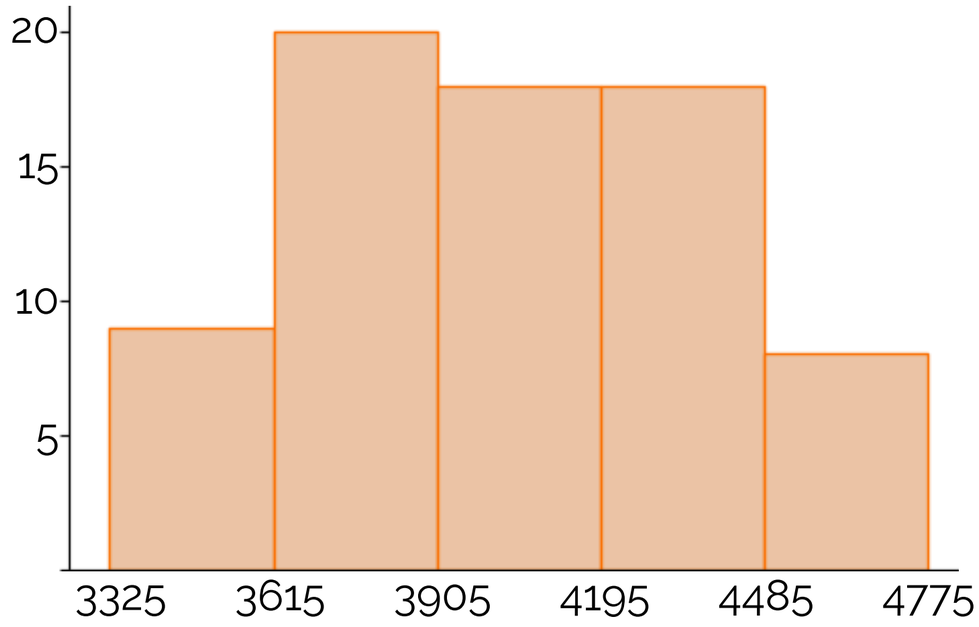
8 variables (n = 344 penguins)

Speci	Penguin
Island	Island in the
Bill	Length of the
Bill	Depth
Flippe	Length of the
Body	Body mass of
Sex	Male or
Year	Year of

73 male Adelie penguins
min body mass = 3325 g
max body mass = 4775 g

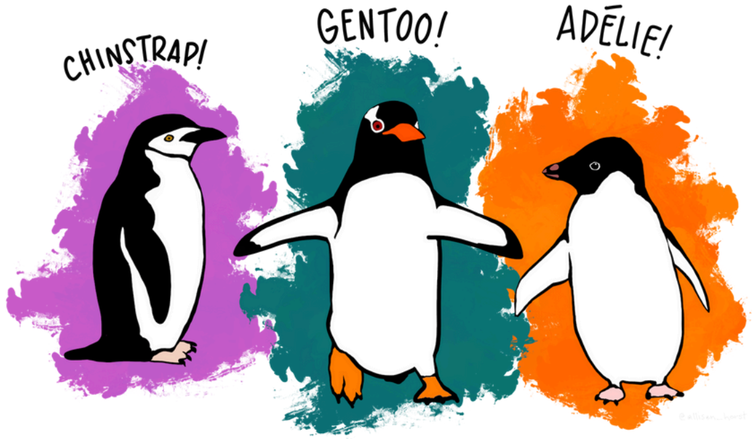
Body mass (g)	Frequency	Proportion
[3325...3615)	9	0.123
[3615...3905)	20	0.274
[3905..4195)	18	0.247
[4195...4485)	18	0.247
[4485...4775)	8	0.11
TOTAL	**73**	**1**

HISTOGRAM



These data were collected from 2007 - 2009 by Dr. Kristen Gorman with the Palmer Station Long Term Ecological Research Program, part of the US Long Term Ecological Research Network.

NUMERIC VARIABLES



The **palmerpenguins** data contains size measurements for three penguin species observed on three islands in the Palmer Archipelago, Antarctica.

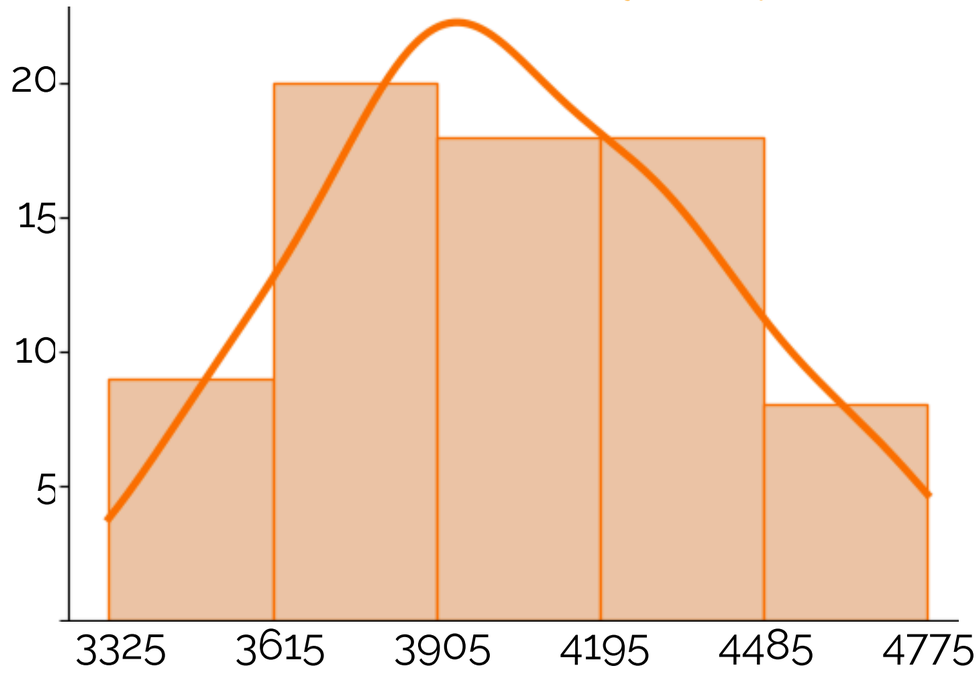
8 variables (n = 344 penguins)

Speci	Penguin
Island	Island in the
Bill	Length of the
Bill	Depth
Flippe	Length of the
Body	Body mass of
Sex	Male or
Year	Year of

73 male Adelie penguins
min body mass = 3325 g
max body mass = 4775 g

Body mass (g)	Frequency	Proportion
[3325...3615)	9	0.123
[3615...3905)	20	0.274
[3905..4195)	18	0.247
[4195...4485)	18	0.247
[4485...4775)	8	0.11
TOTAL	**73**	**1**

KERNEL DENSITY (PLOT)



These data were collected from 2007 - 2009 by Dr. Kristen Gorman with the Palmer Station Long Term Ecological Research Program, part of the US Long Term Ecological Research Network.

ESTIMATES OF LOCATION
MEASURE OF CENTRAL TENDENCY

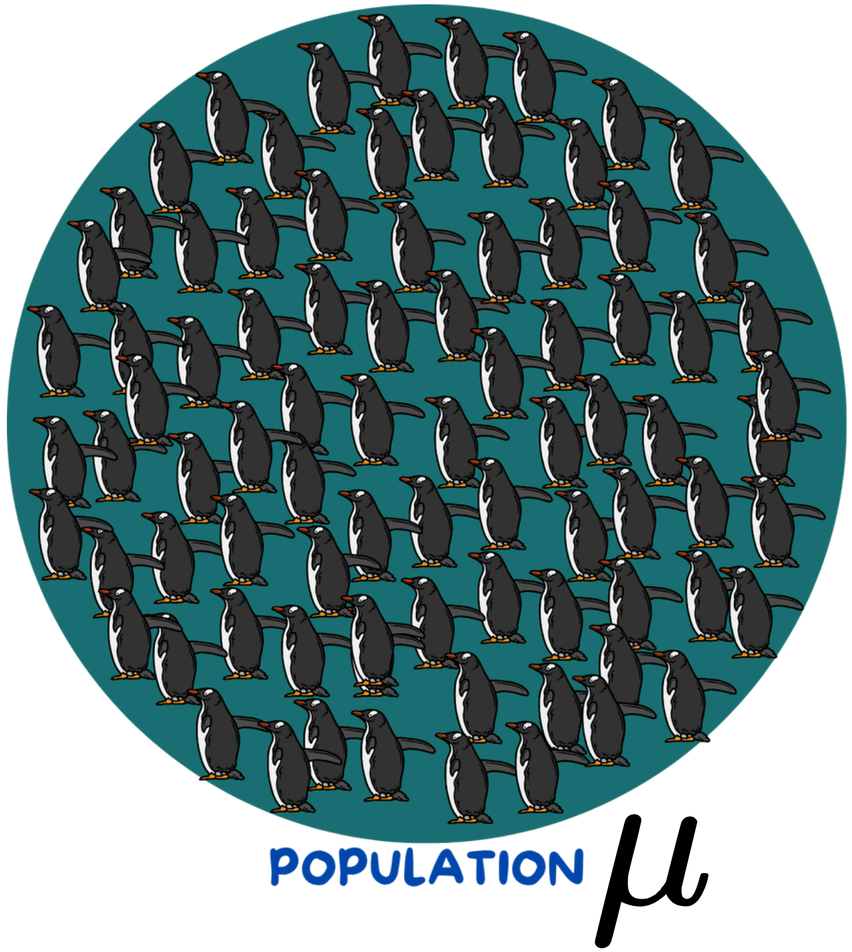
MEAN	MEDIAN	MODE
QUANTILES	RANGE & IQR	VARIANCE & STD DEV

ESTIMATES OF LOCATION
MEASURE OF CENTRAL TENDENCY

MEAN	MEDIAN	MODE
QUANTILES	RANGE & IQR	VARIANCE & STD DEV

ESTIMATES OF LOCATION
MEASURE OF CENTRAL TENDENCY

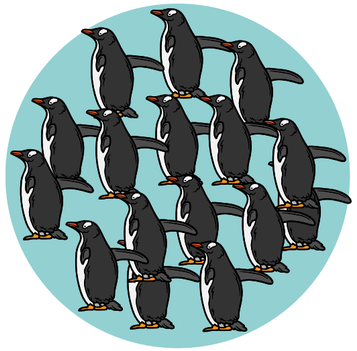
MEAN	MEDIAN	MODE
QUANTILES	RANGE & IQR	VARIANCE & STD DEV



$$\mu = \frac{\sum x}{N}$$

ESTIMATES OF LOCATION
MEASURE OF CENTRAL TENDENCY

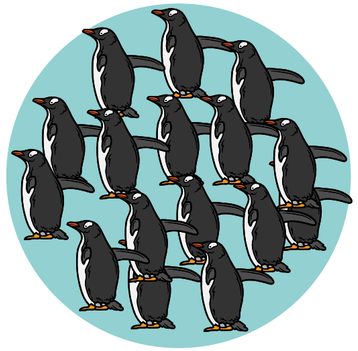
MEAN	MEDIAN	MODE
QUANTILES	RANGE & IQR	VARIANCE & STD DEV



$$\mu = \frac{\sum x}{N}$$

ESTIMATES OF LOCATION
MEASURE OF CENTRAL TENDENCY

MEAN	MEDIAN	MODE
QUANTILES	RANGE & IQR	VARIANCE & STD DEV

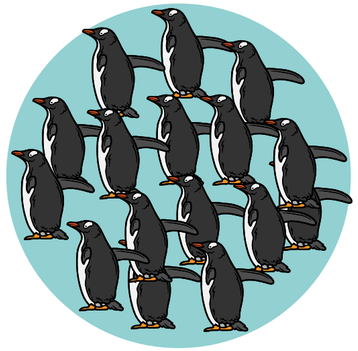


SAMPLE

$$\bar{x} = \frac{\sum x}{n}$$

ESTIMATES OF LOCATION
MEASURE OF CENTRAL TENDENCY

MEAN	MEDIAN	MODE
QUANTILES	RANGE & IQR	VARIANCE & STD DEV



SAMPLE

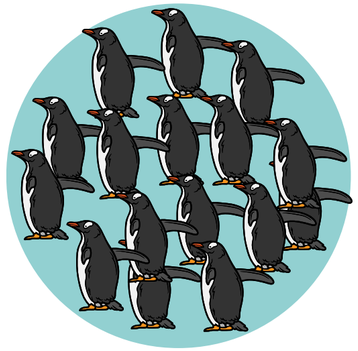
$$\bar{x} = \frac{\sum x}{n}$$

[10, 28, 28, 33, 54]

$$\bar{x} = \frac{10 + 28 + 28 + 33 + 54}{5} = 30.6$$

ESTIMATES OF LOCATION
MEASURE OF CENTRAL TENDENCY

MEAN	MEDIAN	MODE
QUANTILES	RANGE & IQR	VARIANCE & STD DEV



SAMPLE

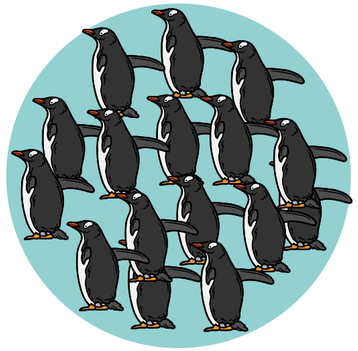
$$\bar{x} = \frac{\sum x}{n}$$

MEAN OF CATEGORICAL VARIABLE?

[Male, Female, Female, Male, Female, Female]

ESTIMATES OF LOCATION
MEASURE OF CENTRAL TENDENCY

MEAN	MEDIAN	MODE
QUANTILES	RANGE & IQR	VARIANCE & STD DEV



SAMPLE

$$\bar{x} = \frac{\sum x}{n}$$

MEAN OF CATEGORICAL VARIABLE?

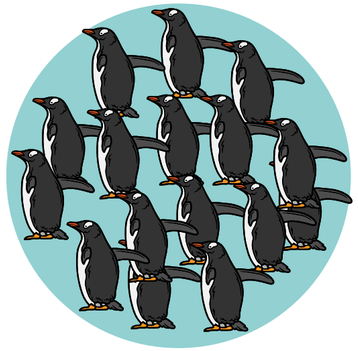
[Male, Female, Female, Male, Female, Female]

[0, 1, 1, 0, 1, 1]

$$\bar{x} = \frac{0+1+1+0+1+1}{6} = 0.66\ldots$$

ESTIMATES OF LOCATION
MEASURE OF CENTRAL TENDENCY

MEAN	MEDIAN	MODE
QUANTILES	RANGE & IQR	VARIANCE & STD DEV



SAMPLE

$$\bar{x} = \frac{\sum x}{n}$$

MEAN OF BINARY VARIABLE > PROPORTION

[Male, Female, Female, Male, Female, Female]

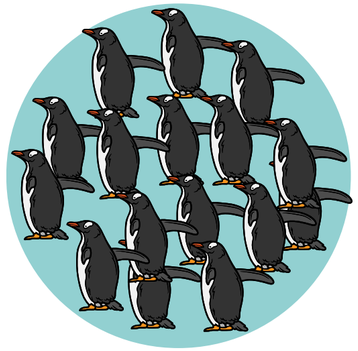
[0, 1, 1, 0, 1, 1]

$$\bar{x} = \frac{0+1+1+0+1+1}{6} = 0.66\ldots$$

ESTIMATES OF LOCATION
MEASURE OF CENTRAL TENDENCY

MEAN | MEDIAN | MODE

QUANTILES | RANGE & IQR | VARIANCE & STD DEV



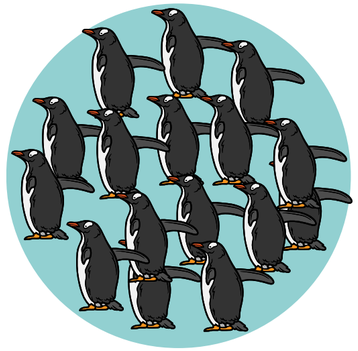
SAMPLE

$$\bar{x} = \frac{\sum x}{n}$$

[10, 28, 28, 33, 54]

ESTIMATES OF LOCATION
MEASURE OF CENTRAL TENDENCY

MEAN	MEDIAN	MODE
QUANTILES	RANGE & IQR	VARIANCE & STD DEV



SAMPLE

$$\bar{x} = \frac{\sum x}{n}$$

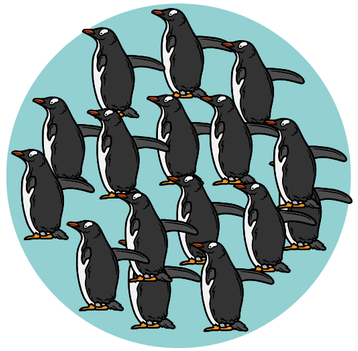
[10, 28, 28, 33, 54]

$$Med = 28$$

ESTIMATES OF LOCATION
MEASURE OF CENTRAL TENDENCY

MEAN | MEDIAN | MODE

QUANTILES | RANGE & IQR | VARIANCE & STD DEV



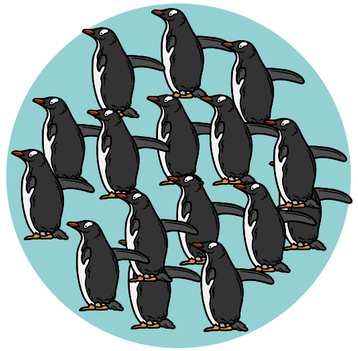
SAMPLE

$$\bar{x} = \frac{\sum x}{n}$$

[10, 28, 28, 33, 54, 59]

ESTIMATES OF LOCATION
MEASURE OF CENTRAL TENDENCY

MEAN	**MEDIAN**	MODE
QUANTILES	RANGE & IQR	VARIANCE & STD DEV



SAMPLE

$$\bar{x} = \frac{\sum x}{n}$$

Middle value of ordered observations (50% below, 50% above)

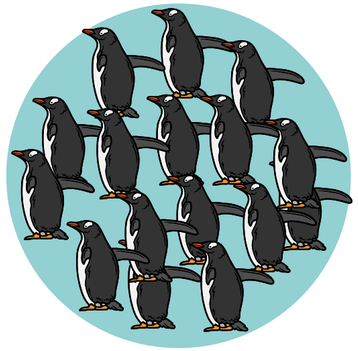
[10, 28, 28, 33, 54, 59]

$$Med = \frac{28 + 33}{2} = 30.5$$

ESTIMATES OF LOCATION
MEASURE OF CENTRAL TENDENCY

MEAN | **MEDIAN** | **MODE**

QUANTILES | **RANGE & IQR** | **VARIANCE & STD DEV**



SAMPLE

$$\bar{x} = \frac{\sum x}{n}$$

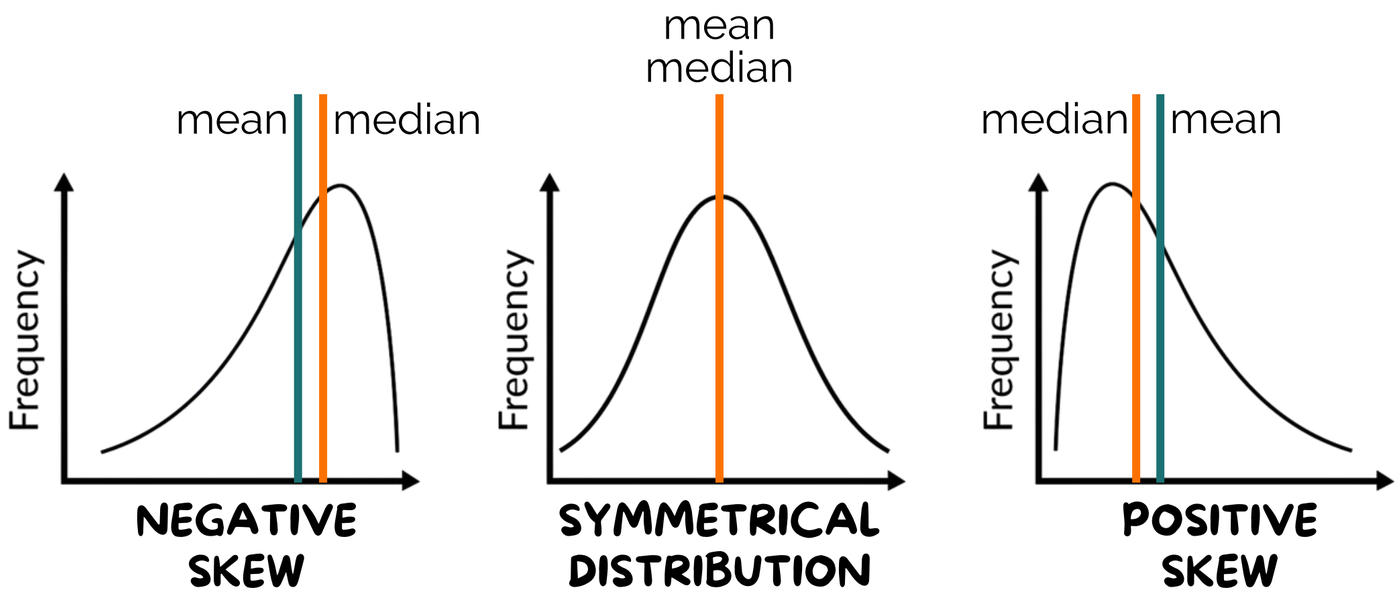
Mean:
- sensitive to outliers
- “balance” point

Median:
- not sensitive to outliers
- cuts data in half

[10, 28, 28, 33, 54]

$$\bar{x} = \frac{10 + 28 + 28 + 33 + 54}{5} = 30.6$$

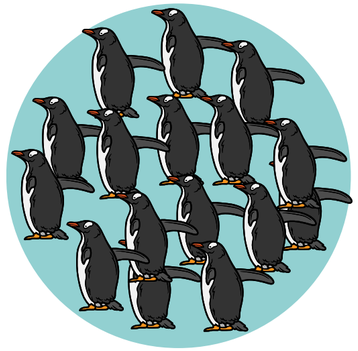
$$Med = 28$$



ESTIMATES OF LOCATION
MEASURE OF CENTRAL TENDENCY

MEAN | MEDIAN | **MODE**

QUANTILES | RANGE & IQR | VARIANCE & STD DEV



SAMPLE

$$\bar{x} = \frac{\sum x}{n}$$

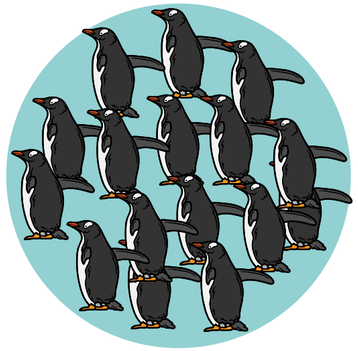
The observation with the highest frequency

[10, 28, 28, 33, 54]

ESTIMATES OF LOCATION
MEASURE OF CENTRAL TENDENCY

MEAN | MEDIAN | **MODE**

QUANTILES | RANGE & IQR | VARIANCE & STD DEV



SAMPLE

$$\bar{x} = \frac{\sum x}{n}$$

The observation with the highest frequency

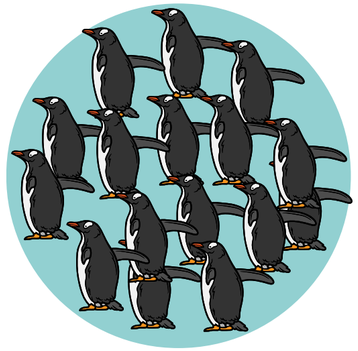
[10, 28, 28, 33, 54]

$$Mode = 28$$

ESTIMATES OF LOCATION
MEASURE OF CENTRAL TENDENCY

MEAN | MEDIAN | **MODE**

QUANTILES | RANGE & IQR | VARIANCE & STD DEV



SAMPLE

$$\bar{x} = \frac{\sum x}{n}$$

The observation with the highest frequency

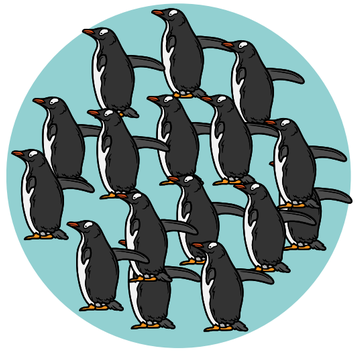
[10, 27, 28, 33, 54]

$$Mode = ?$$

ESTIMATES OF LOCATION
MEASURE OF CENTRAL TENDENCY

MEAN | MEDIAN | **MODE**

QUANTILES | RANGE & IQR | VARIANCE & STD DEV



SAMPLE

$$\bar{x} = \frac{\sum x}{n}$$

The observation with the highest frequency

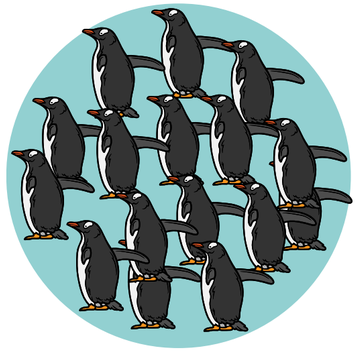
[10, 27, 28, 54, 54]

$$Mode = 54$$

Not suitable for small datasets

ESTIMATES OF LOCATION
MEASURE OF CENTRAL TENDENCY

MEAN	MEDIAN	**MODE**
QUANTILES	RANGE & IQR	VARIANCE & STD DEV

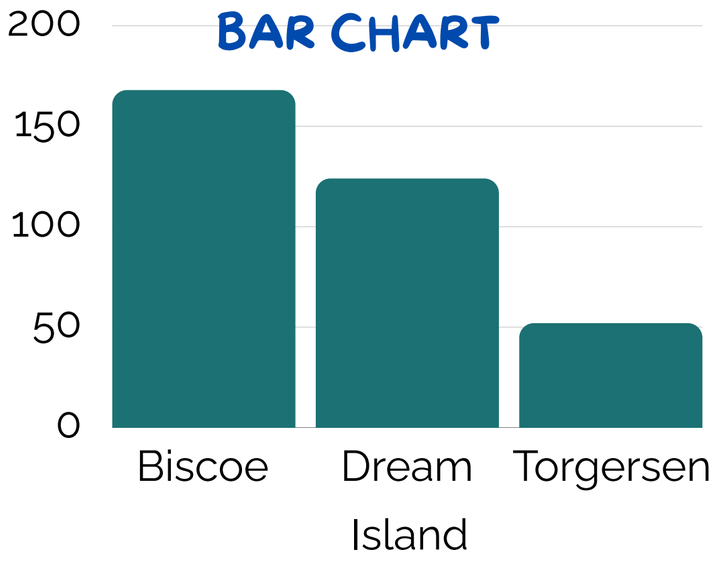


SAMPLE

$$\bar{x} = \frac{\sum x}{n}$$

The observation with the highest frequency

$$Mode = Biscoe$$

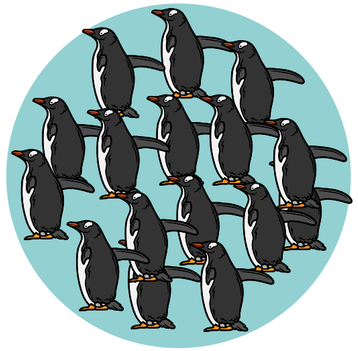


These data were collected from 2007 - 2009 by Dr. Kristen Gorman with the Palmer Station Long Term Ecological Research Program, part of the US Long Term Ecological Research Network.

ESTIMATES OF LOCATION
MEASURE OF CENTRAL TENDENCY

MEAN | MEDIAN | **MODE**

QUANTILES | RANGE & IQR | VARIANCE & STD DEV



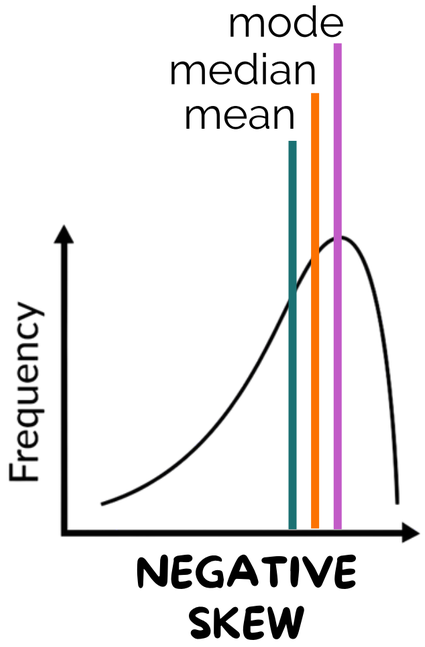
SAMPLE

$$\bar{x} = \frac{\sum x}{n}$$

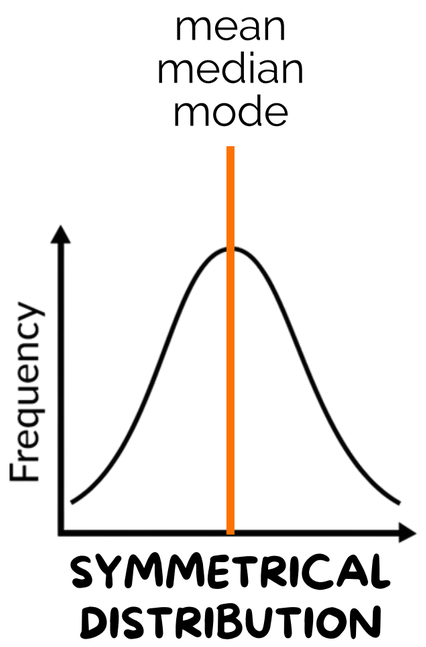
Mean:
- sensitive to outliers
- “balance” point

Median:
- not sensitive to outliers
- cuts data in half

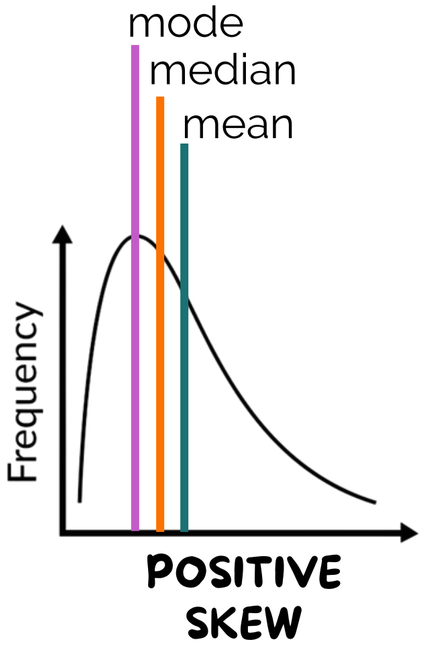
Mode:
The observation with the highest frequency



NEGATIVE SKEW



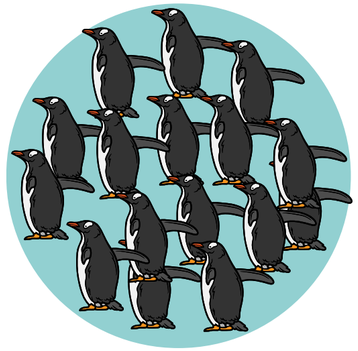
SYMMETRICAL DISTRIBUTION



POSITIVE SKEW

ESTIMATES OF LOCATION
MEASURE OF CENTRAL TENDENCY

MEAN	MEDIAN	MODE
QUANTILES	RANGE & IQR	VARIANCE & STD DEV



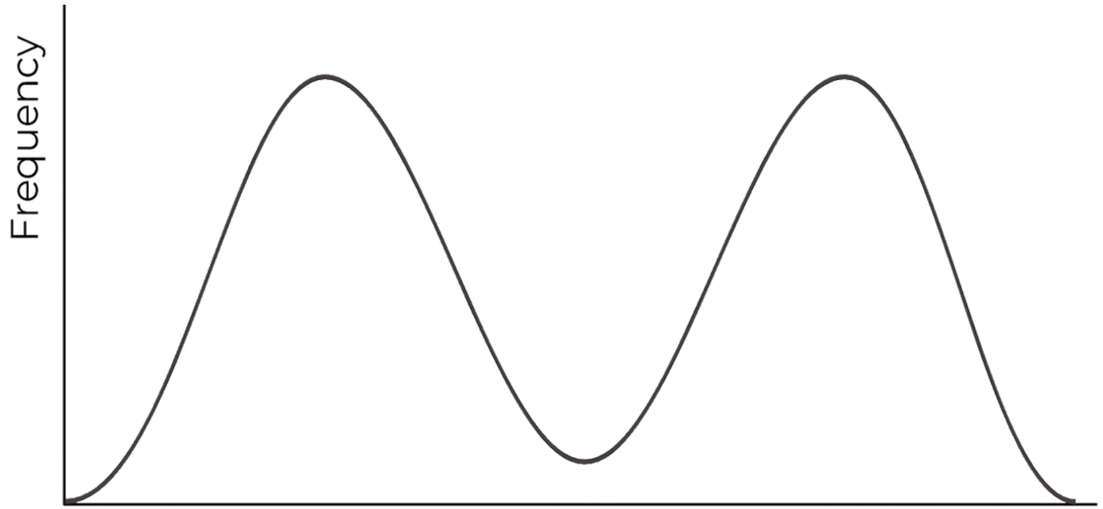
SAMPLE

$$\bar{x} = \frac{\sum x}{n}$$

Mean:
- sensitive to outliers
- “balance” point

Median:
- not sensitive to outliers
- cuts data in half

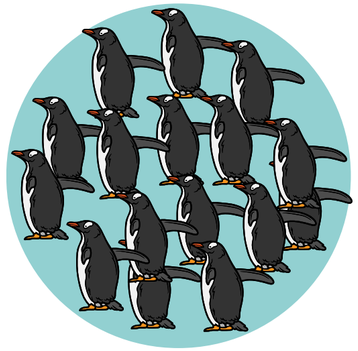
Mode:
The observation with the highest frequency



SYMMETRICAL DISTRIBUTION

ESTIMATES OF LOCATION
MEASURE OF CENTRAL TENDENCY

MEAN	MEDIAN	MODE
QUANTILES	RANGE & IQR	VARIANCE & STD DEV



SAMPLE

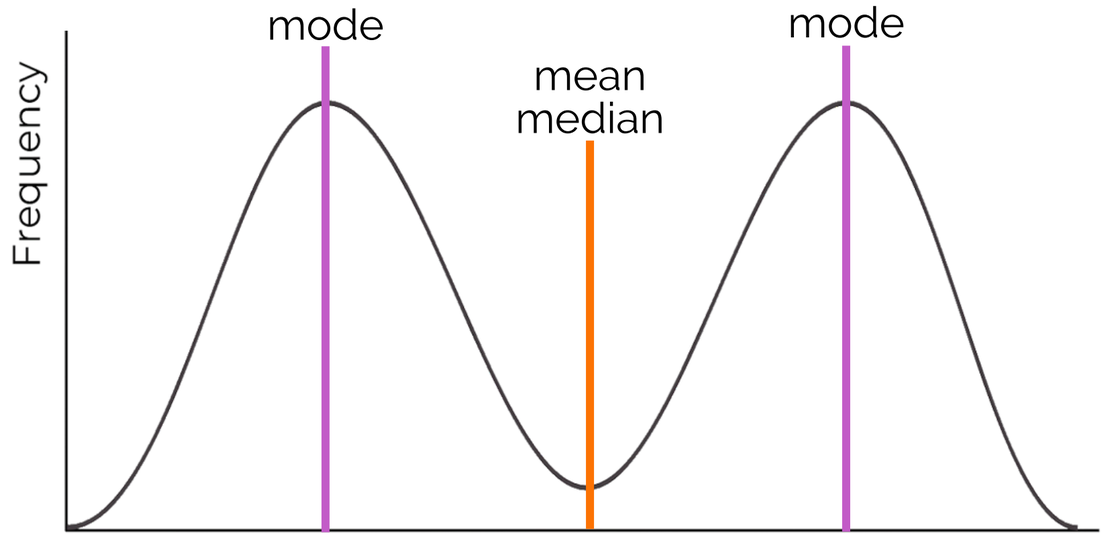
$$\bar{x} = \frac{\sum x}{n}$$

Mean:
- sensitive to outliers
- “balance” point

Median:
- not sensitive to outliers
- cuts data in half

Mode:
The observation with the highest frequency

BIMODAL DISTRIBUTION

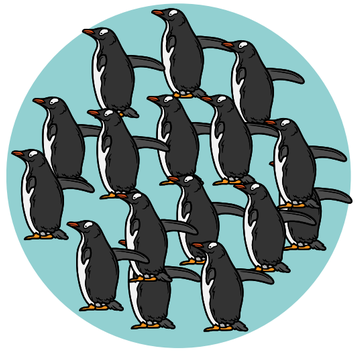


SYMMETRICAL DISTRIBUTION

ESTIMATES OF LOCATION
DESCRIBING THE DISTRIBUTION

MEAN | MEDIAN | MODE

QUANTILES | RANGE & IQR | VARIANCE & STD DEV



SAMPLE

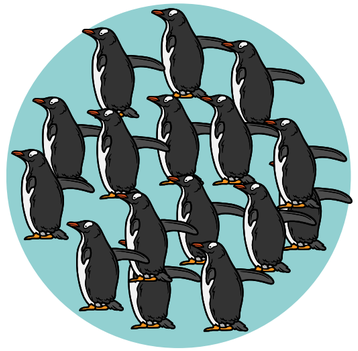
[4, 7, 8, ..., 178, 180, 189]

n = 23

ESTIMATES OF LOCATION
DESCRIBING THE DISTRIBUTION

MEAN | MEDIAN | MODE

QUANTILES | RANGE & IQR | VARIANCE & STD DEV



SAMPLE

[4, 7, 8, ..., 178, 180, 189]

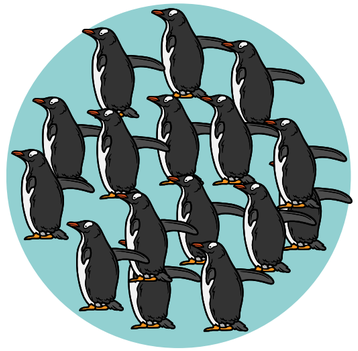
n = 23

MEDIAN

ESTIMATES OF LOCATION
DESCRIBING THE DISTRIBUTION

MEAN | MEDIAN | MODE

QUANTILES | RANGE & IQR | VARIANCE & STD DEV



SAMPLE

[4, 7, 8, ..., 178, 180, 189]

n = 23

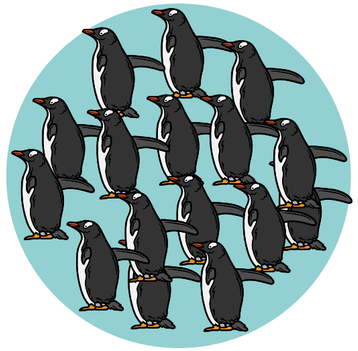
First quartile (Q1) : 25% (1/4) of observations below

Third quartile (Q3) : 75% (3/4) of observations below

ESTIMATES OF LOCATION
DESCRIBING THE DISTRIBUTION

MEAN | MEDIAN | MODE

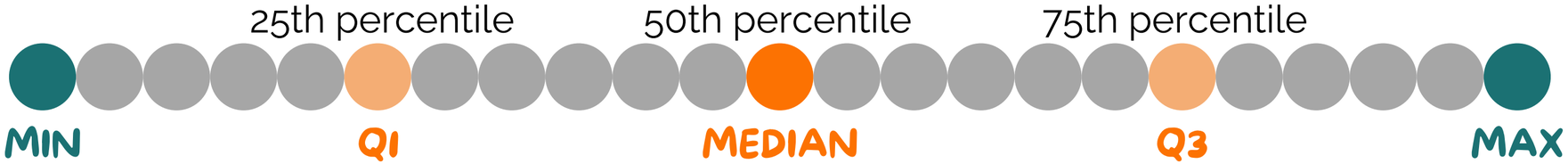
QUANTILES | RANGE & IQR | VARIANCE & STD DEV



SAMPLE

[4, 7, 8, ..., 178, 180, 189]

n = 23



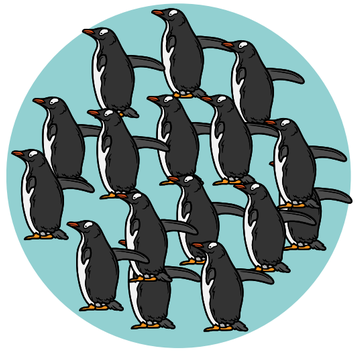
First quartile (Q1) : 25% (1/4) of observations below

Third quartile (Q3) : 75% (3/4) of observations below

ESTIMATES OF LOCATION
DESCRIBING THE DISTRIBUTION

MEAN | MEDIAN | MODE

QUANTILES | RANGE & IQR | VARIANCE & STD DEV



SAMPLE

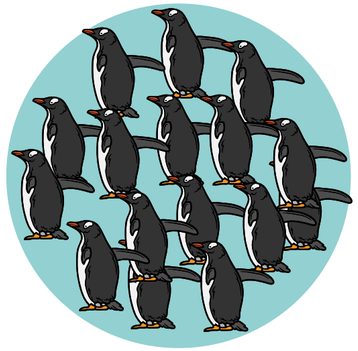
[2, 2, 5, 6, 9, 10, 13]

2 2 5 6 9 10 13

ESTIMATES OF LOCATION
DESCRIBING THE DISTRIBUTION

MEAN | MEDIAN | MODE

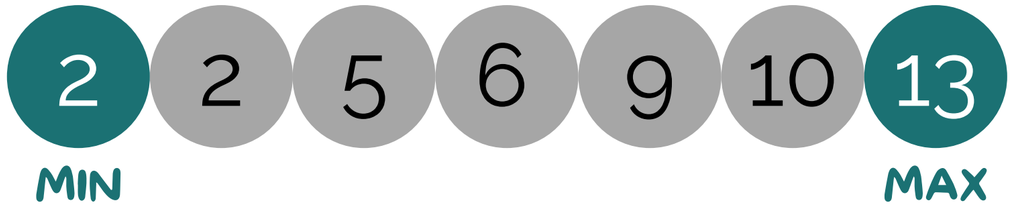
QUANTILES | **RANGE & IQR** | **VARIANCE & STD DEV**



SAMPLE

[2, 2, 5, 6, 9, 10, 13]

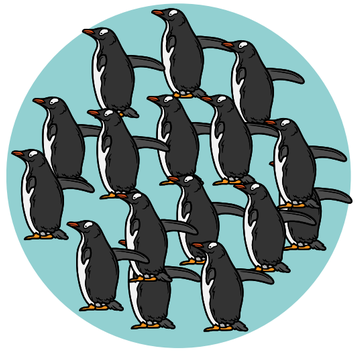
Range: MAX - MIN = 13 - 2 = 11



ESTIMATES OF LOCATION
DESCRIBING THE DISTRIBUTION

MEAN | MEDIAN | MODE

QUANTILES | **RANGE & IQR** | **VARIANCE & STD DEV**

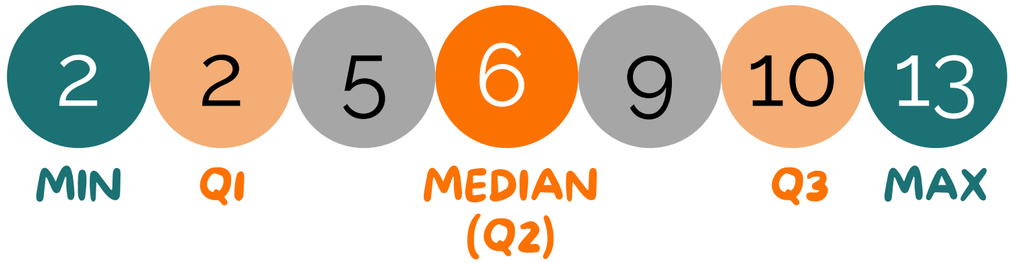


SAMPLE

[2, 2, 5, 6, 9, 10, 13]

Range: MAX - MIN = 13 - 2 = 11

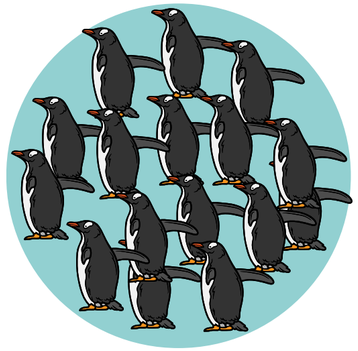
IQR: Q3 - Q1 = 10 - 2 = 8



ESTIMATES OF LOCATION
DESCRIBING THE DISTRIBUTION

MEAN | MEDIAN | MODE

QUANTILES | **RANGE & IQR** | **VARIANCE & STD DEV**

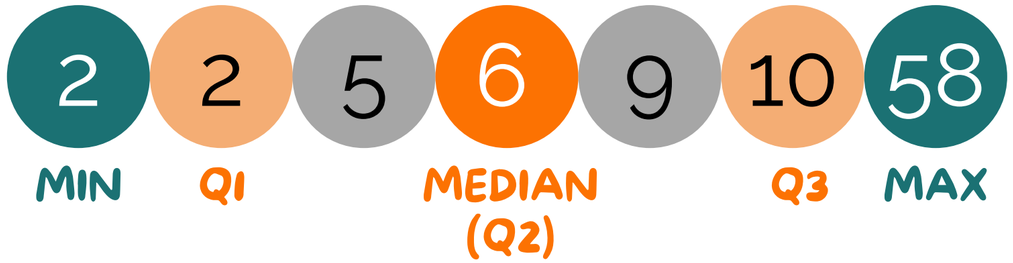


SAMPLE

[2, 2, 5, 6, 9, 10, 58]

Range: MAX - MIN = 58 - 2 = 56 Range is sensitive to outliers

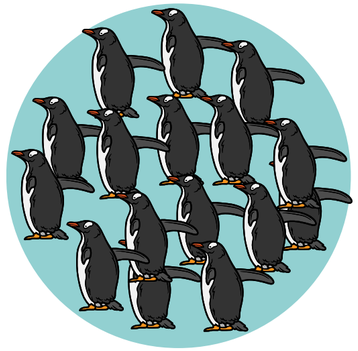
IQR: Q3 - Q1 = 10 - 2 = 8 The middle 50% of the ordered data
Not sensitive to outliers



ESTIMATES OF LOCATION
DESCRIBING THE DISTRIBUTION

MEAN | MEDIAN | MODE

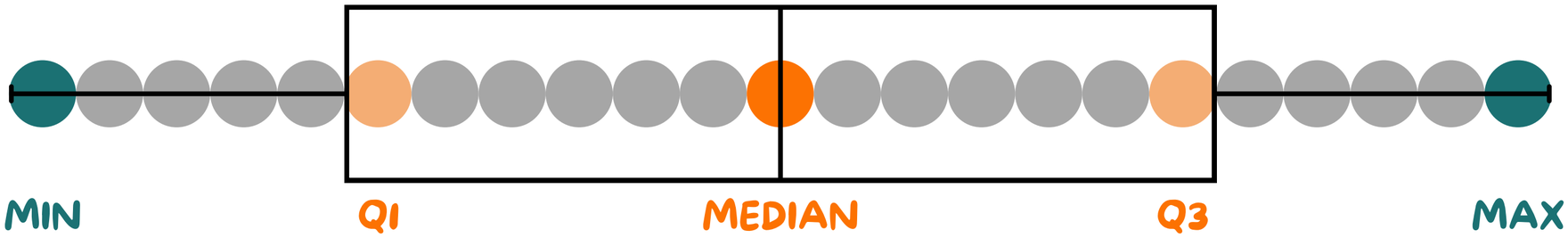
QUANTILES | **RANGE & IQR** | **VARIANCE & STD DEV**



SAMPLE

$n = 23$

BOXPLOT

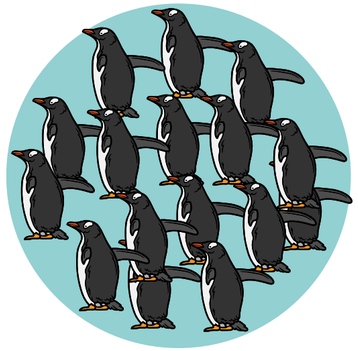


The box-and-whisker plot was first introduced in 1970 by John Tukey

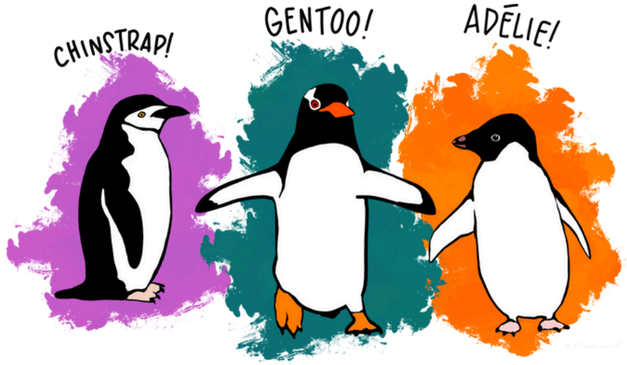
ESTIMATES OF LOCATION
DESCRIBING THE DISTRIBUTION

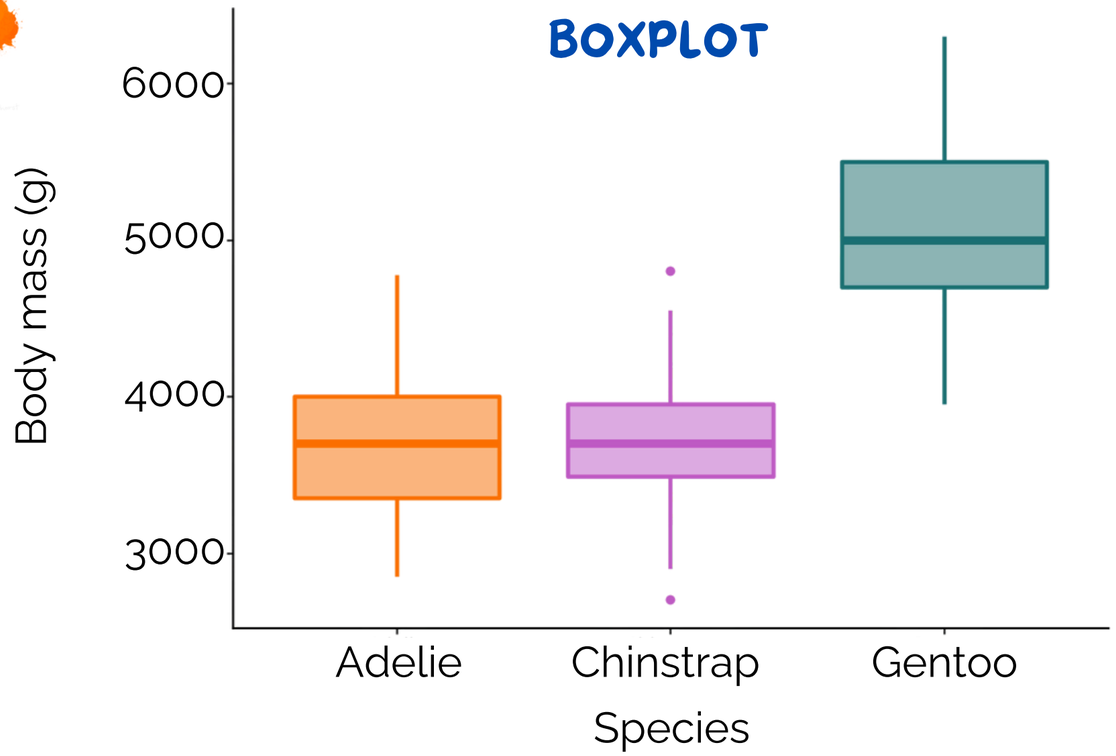
MEAN | MEDIAN | MODE

QUANTILES | **RANGE & IQR** | **VARIANCE & STD DEV**



SAMPLE



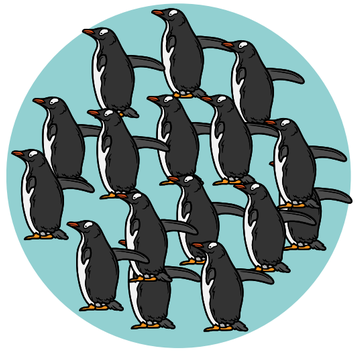


These data were collected from 2007 - 2009 by Dr. Kristen Gorman with the Palmer Station Long Term Ecological Research Program, part of the US Long Term Ecological Research Network.

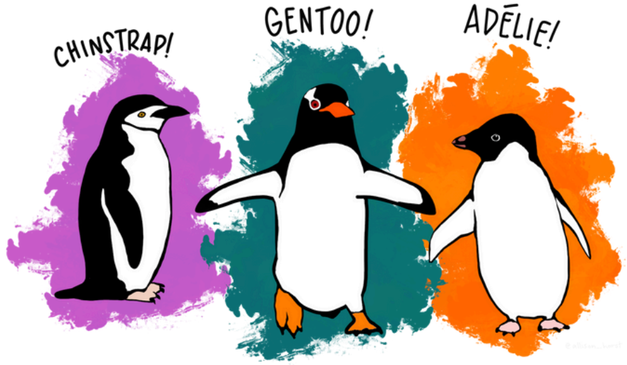
ESTIMATES OF LOCATION
DESCRIBING THE DISTRIBUTION

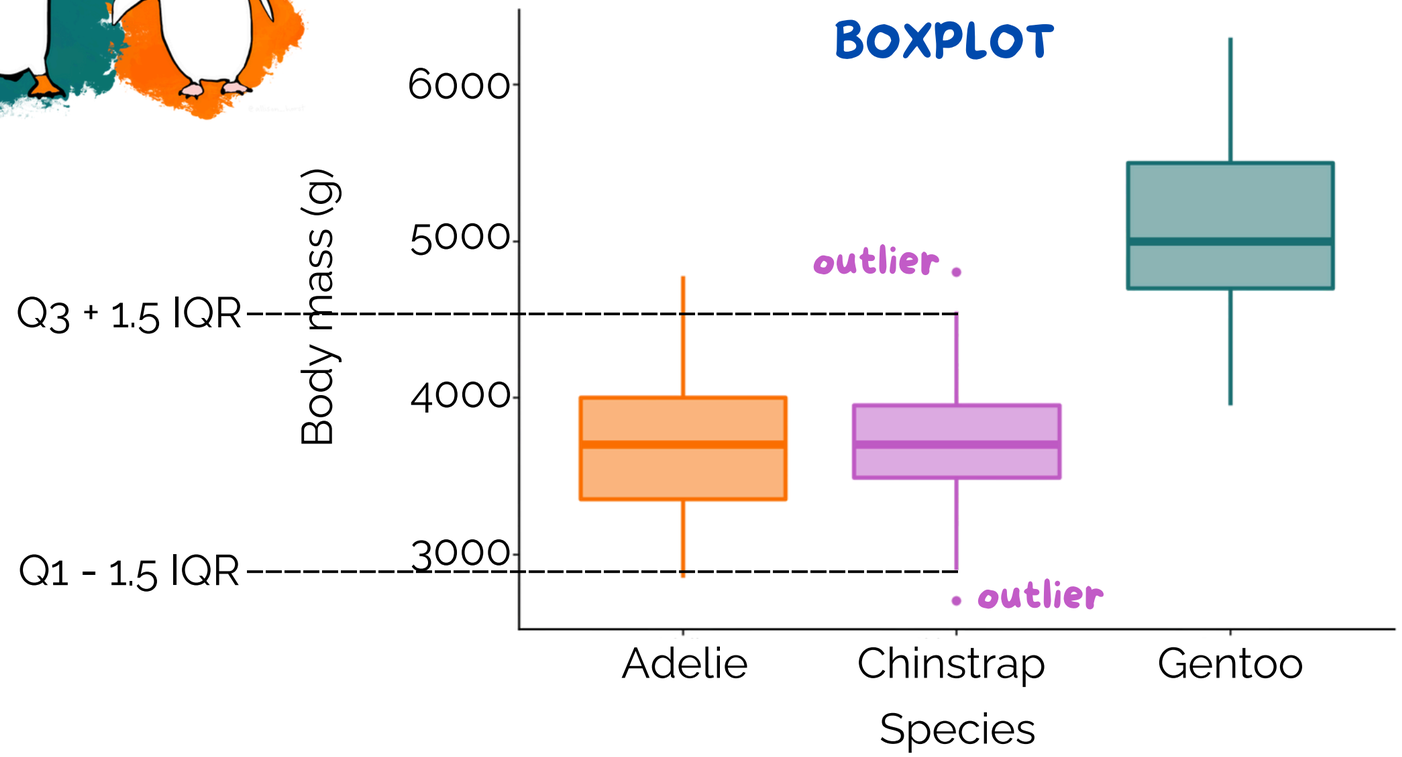
MEAN | MEDIAN | MODE

QUANTILES | **RANGE & IQR** | **VARIANCE & STD DEV**



SAMPLE



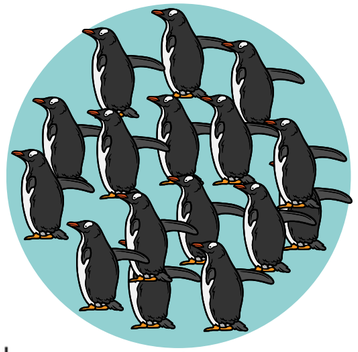


These data were collected from 2007 - 2009 by Dr. Kristen Gorman with the Palmer Station Long Term Ecological Research Program, part of the US Long Term Ecological Research Network.

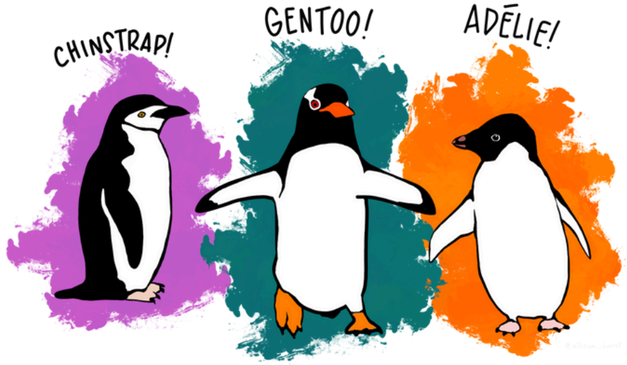
ESTIMATES OF LOCATION
DESCRIBING THE DISTRIBUTION

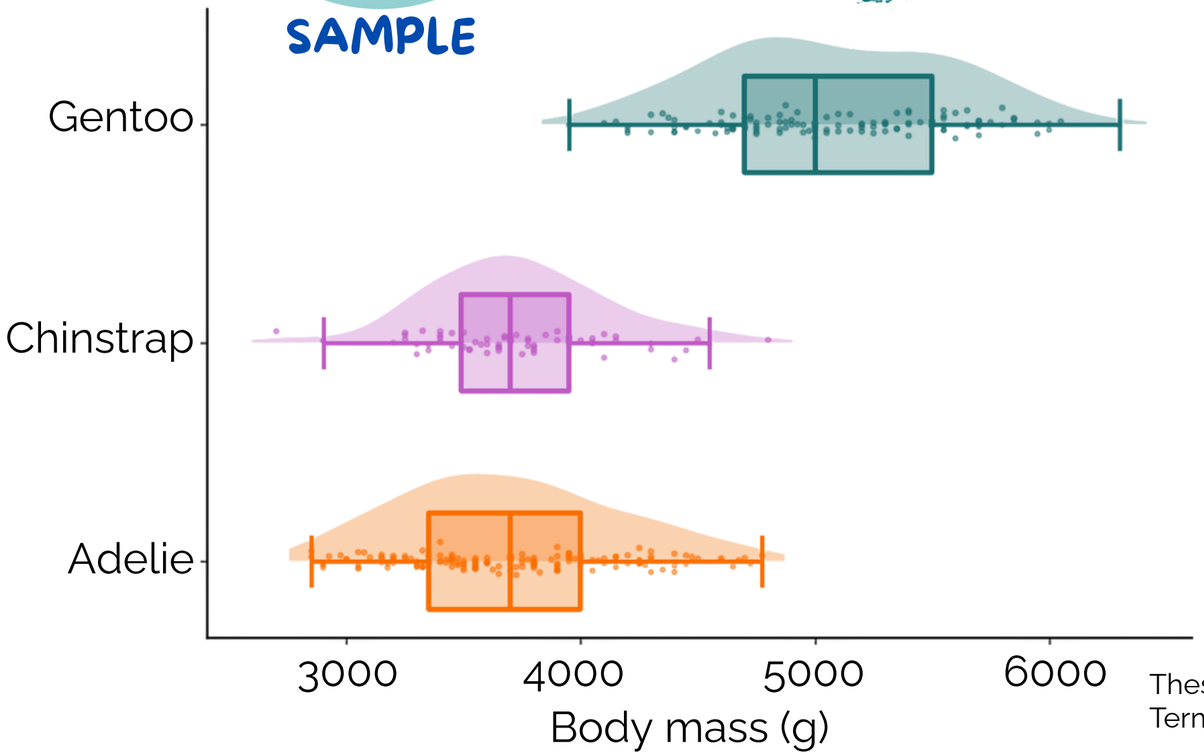
MEAN | MEDIAN | MODE

QUANTILES | RANGE & IQR | VARIANCE & STD DEV



SAMPLE



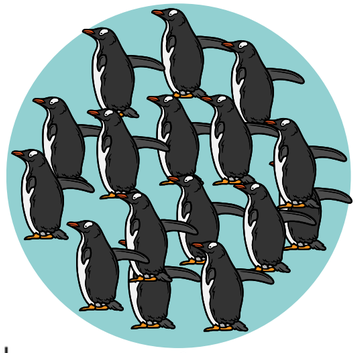


These data were collected from 2007 - 2009 by Dr. Kristen Gorman with the Palmer Station Long Term Ecological Research Program, part of the US Long Term Ecological Research Network.

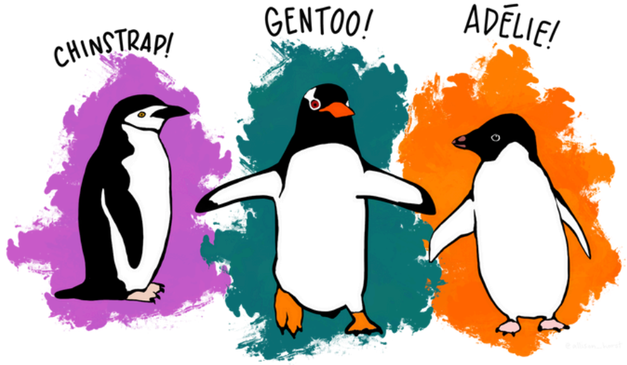
ESTIMATES OF LOCATION
DESCRIBING THE DISTRIBUTION

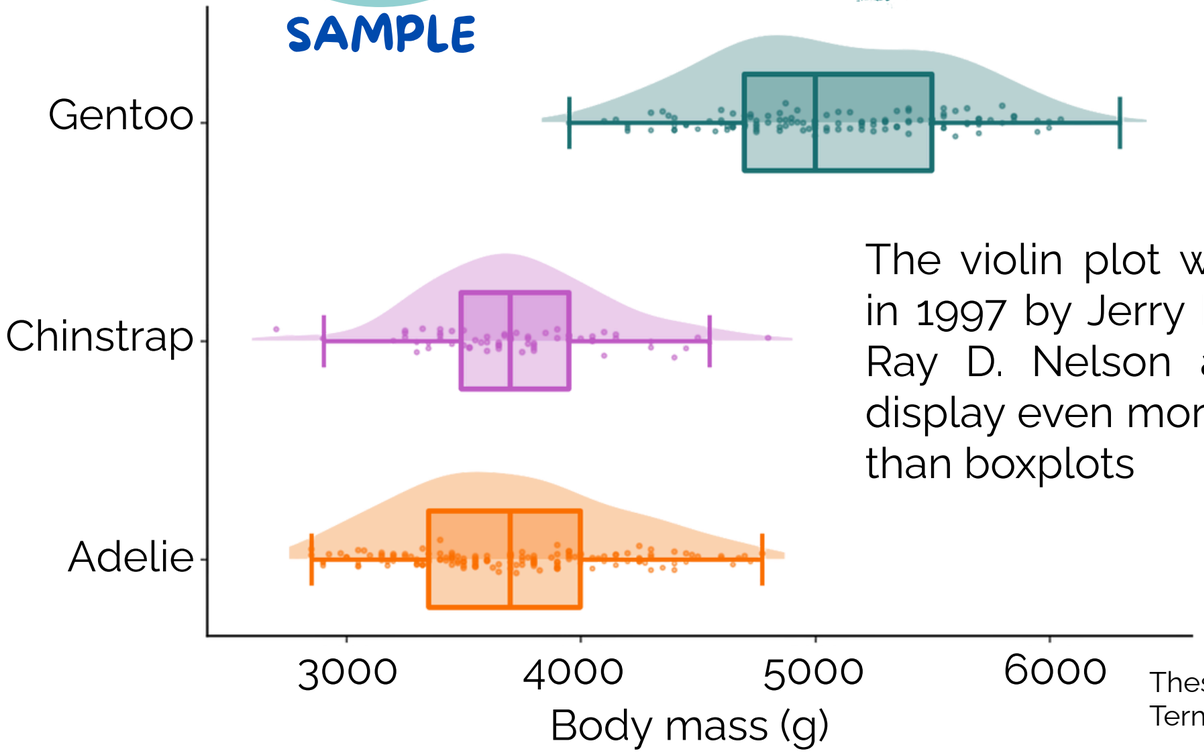
MEAN | MEDIAN | MODE

QUANTILES | **RANGE & IQR** | **VARIANCE & STD DEV**



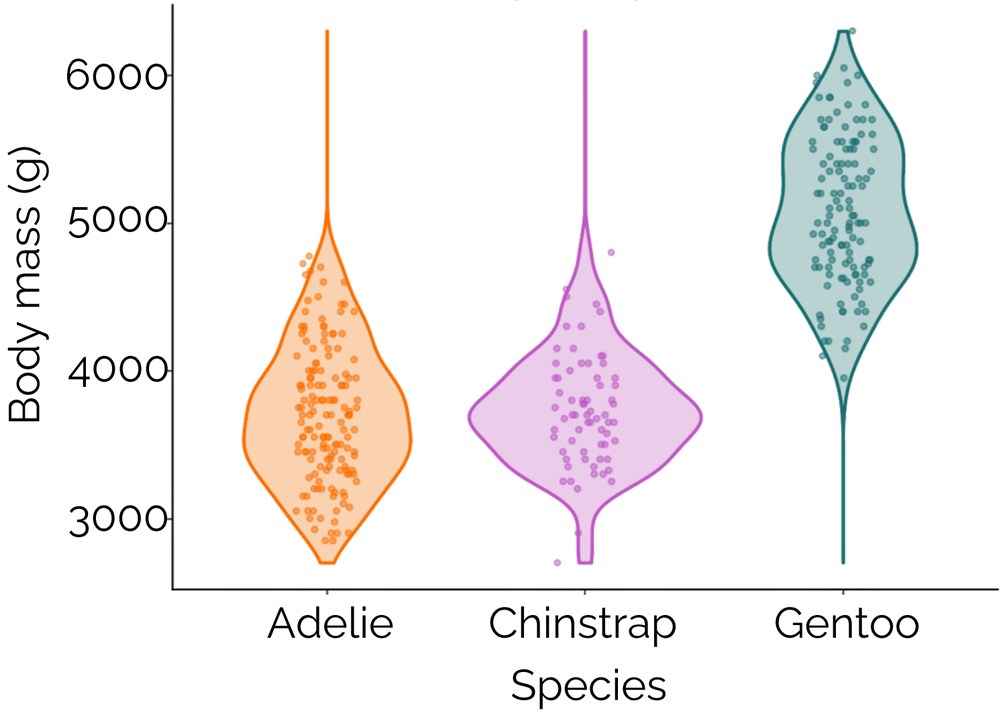
SAMPLE





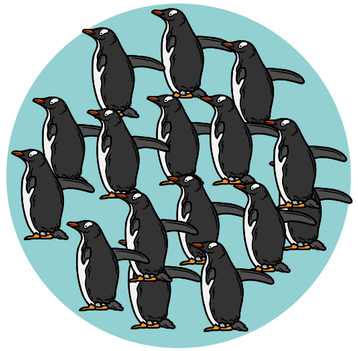
The violin plot was proposed in 1997 by Jerry L. Hintze and Ray D. Nelson as a way to display even more information than boxplots

VIOLIN PLOT



These data were collected from 2007 - 2009 by Dr. Kristen Gorman with the Palmer Station Long Term Ecological Research Program, part of the US Long Term Ecological Research Network.

ESTIMATES OF LOCATION
DESCRIBING THE DISTRIBUTION



SAMPLE

$$\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n}$$

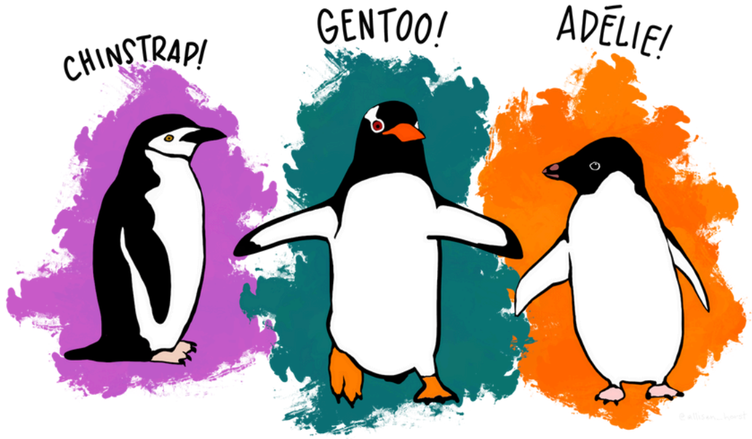
$$s^2 = \frac{\sum_{i=1}^{n} \left(x_i - \bar{x}\right)^2}{n-1}$$

VARIANCE

$$s = \sqrt{s^2} = \sqrt{\frac{\sum_{i=1}^{n} \left(x_i - \bar{x}\right)^2}{n-1}}$$

STANDARD DEVIATION

DATA VISUALIZATION



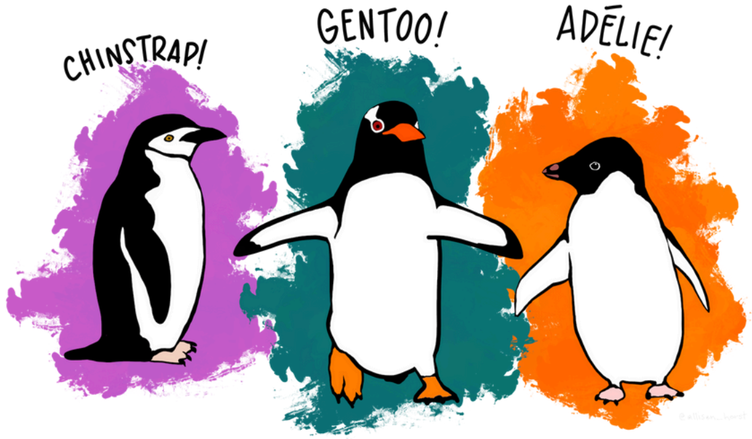
The **palmerpenguins** data contains size measurements for three penguin species observed on three islands in the Palmer Archipelago, Antarctica.

8 variables (n = 344 penguins)

Species	Penguin species (Adélie, Chinstrap, Gentoo)
Island	Island in the Palmer Archipelago where observed
Bill length (mm)	Length of the penguin's bill (mm)
Bill depth (mm)	Depth (thickness) of the penguin's bill (mm)
Flipper length (mm)	Length of the penguin's flipper (mm)
Body mass (g)	Body mass of the penguin (g)
Sex	Male or female (some values missing)
Year	Year of observation (2007–2009)

These data were collected from 2007 - 2009 by Dr. Kristen Gorman with the Palmer Station Long Term Ecological Research Program, part of the US Long Term Ecological Research Network.

DATA VISUALIZATION

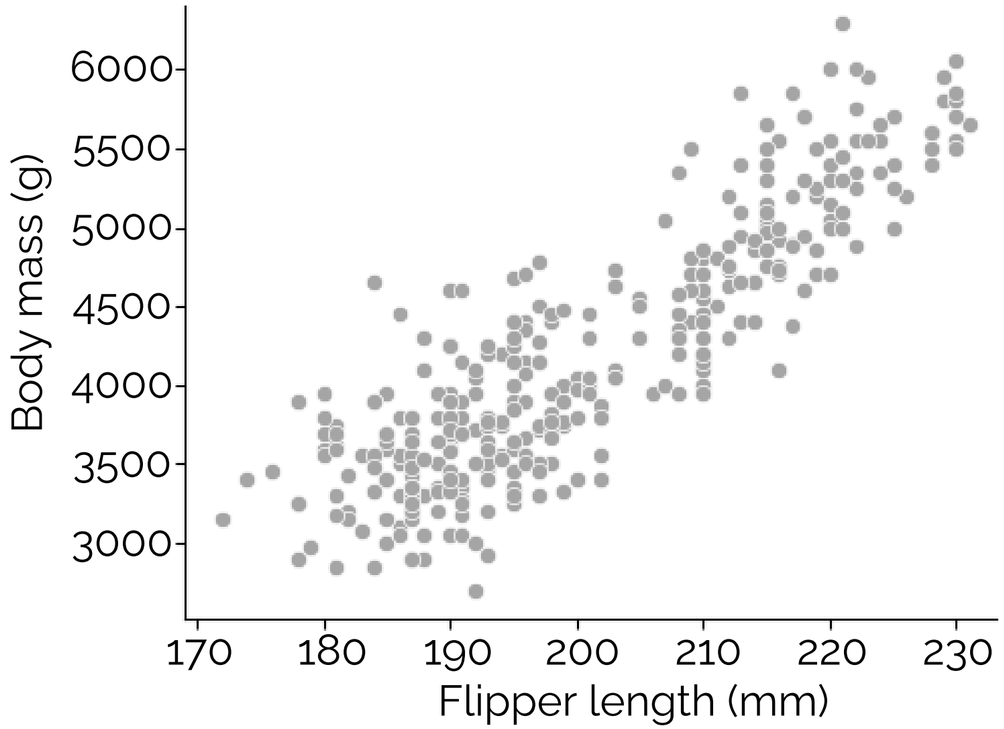


The **palmerpenguins** data contains size measurements for three penguin species observed on three islands in the Palmer Archipelago, Antarctica.

8 variables (n = 344 penguins)

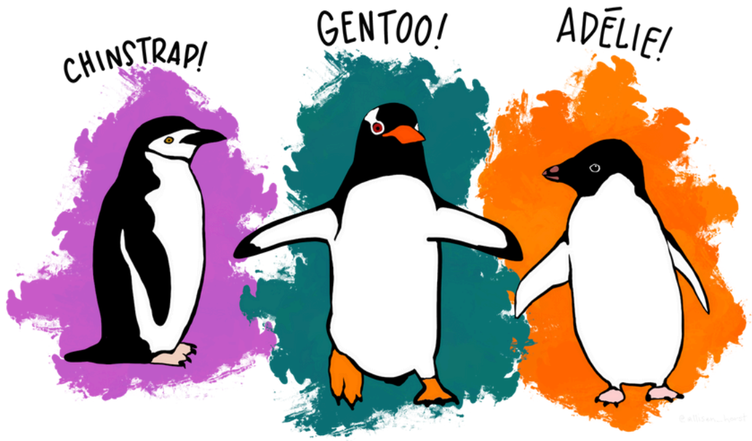
Species	Penguin species (Adélie, Chinstrap, Gentoo)
Island	Island in the Palmer Archipelago where observed
Bill length (mm)	Length of the penguin's bill (mm)
Bill depth (mm)	Depth (thickness) of the penguin's bill (mm)
Flipper length (mm)	Length of the penguin's flipper (mm)
Body mass (g)	Body mass of the penguin (g)
Sex	Male or female (some values missing)
Year	Year of observation (2007–2009)

SCATTER PLOT



These data were collected from 2007 - 2009 by Dr. Kristen Gorman with the Palmer Station Long Term Ecological Research Program, part of the US Long Term Ecological Research Network.

DATA VISUALIZATION

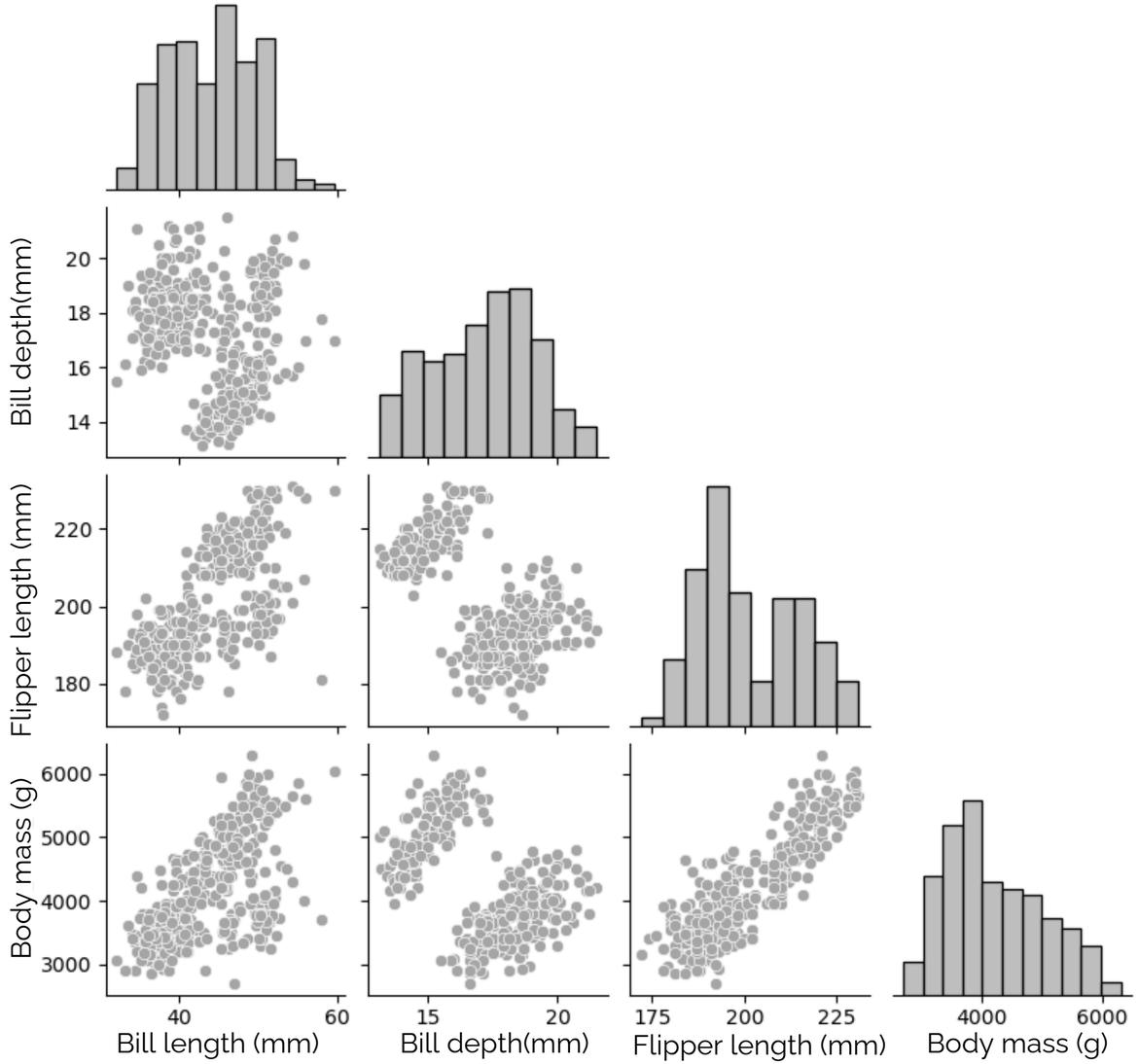


The **palmerpenguins** data contains size measurements for three penguin species observed on three islands in the Palmer Archipelago, Antarctica.

8 variables (n = 344 penguins)

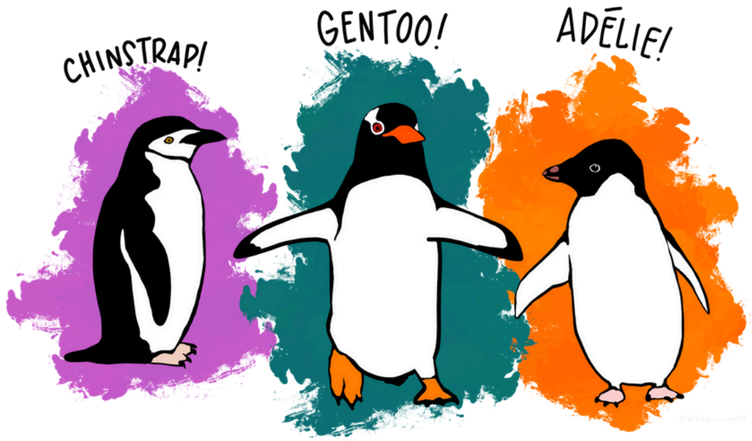
Species	Penguin species (Adélie, Chinstrap, Gentoo)
Island	Island in the Palmer Archipelago where observed
Bill length (mm)	Length of the penguin's bill (mm)
Bill depth (mm)	Depth (thickness) of the penguin's bill (mm)
Flipper length (mm)	Length of the penguin's flipper (mm)
Body mass (g)	Body mass of the penguin (g)
Sex	Male or female (some values missing)
Year	Year of observation (2007–2009)

PAIRPLOT



These data were collected from 2007 - 2009 by Dr. Kristen Gorman with the Palmer Station Long Term Ecological Research Program, part of the US Long Term Ecological Research Network.

DATA VISUALIZATION

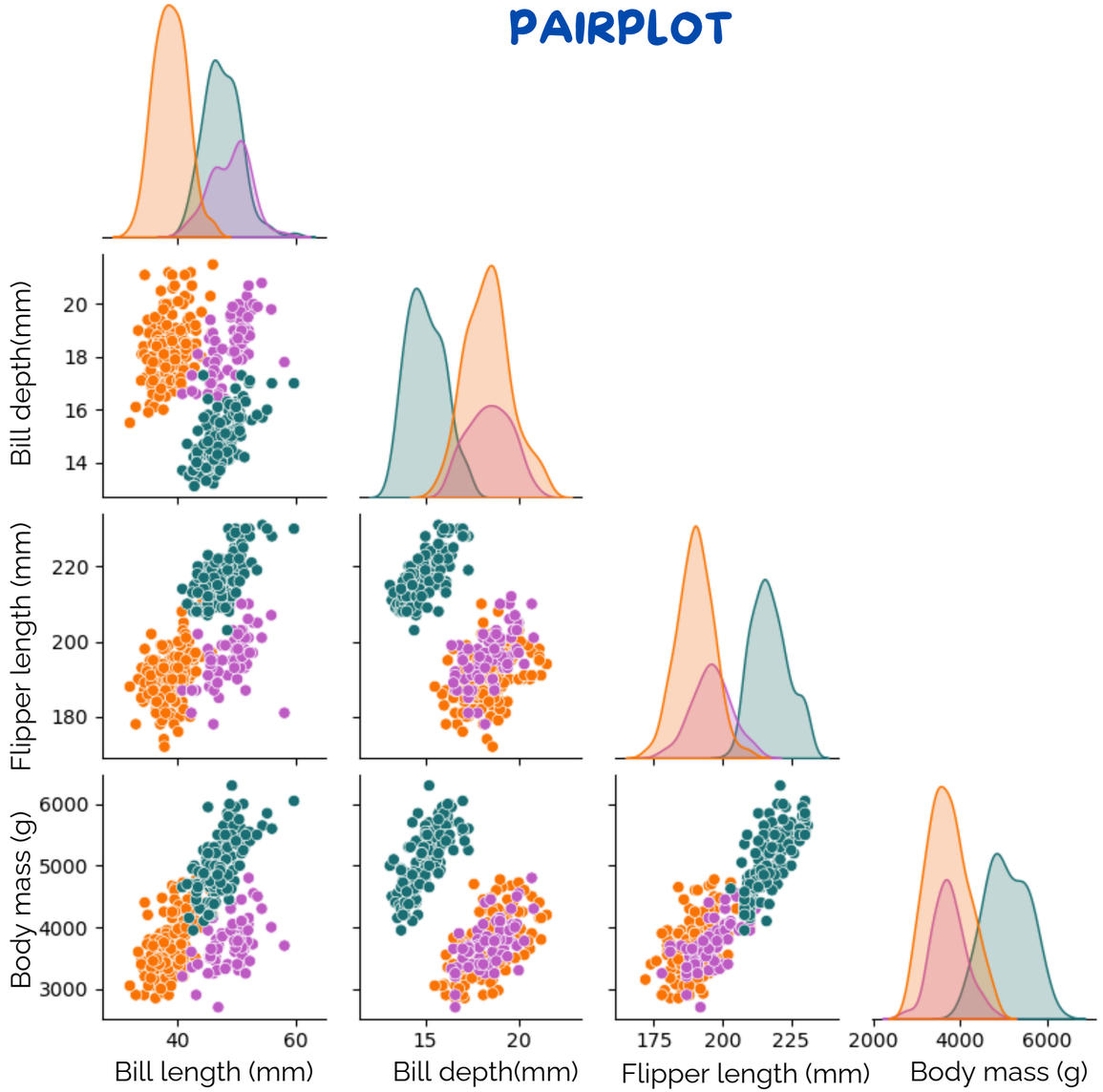


The **palmerpenguins** data contains size measurements for three penguin species observed on three islands in the Palmer Archipelago, Antarctica.

8 variables (n = 344 penguins)

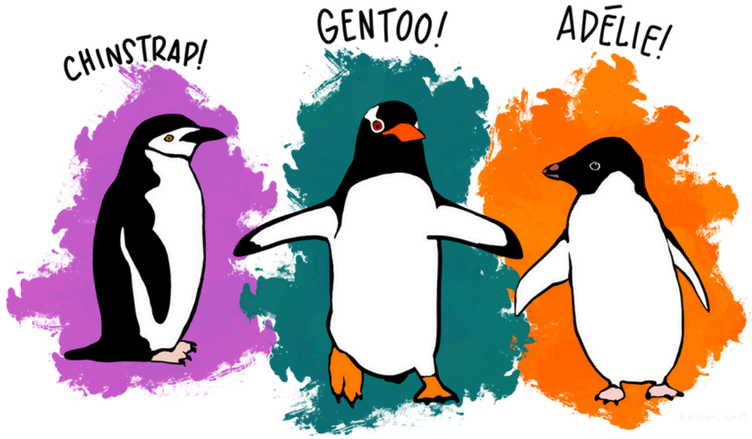
Species	Penguin species (Adélie, Chinstrap, Gentoo)
Island	Island in the Palmer Archipelago where observed
Bill length (mm)	Length of the penguin's bill (mm)
Bill depth (mm)	Depth (thickness) of the penguin's bill (mm)
Flipper length (mm)	Length of the penguin's flipper (mm)
Body mass (g)	Body mass of the penguin (g)
Sex	Male or female (some values missing)
Year	Year of observation (2007–2009)

PAIRPLOT



These data were collected from 2007 - 2009 by Dr. Kristen Gorman with the Palmer Station Long Term Ecological Research Program, part of the US Long Term Ecological Research Network.

DATA VISUALIZATION

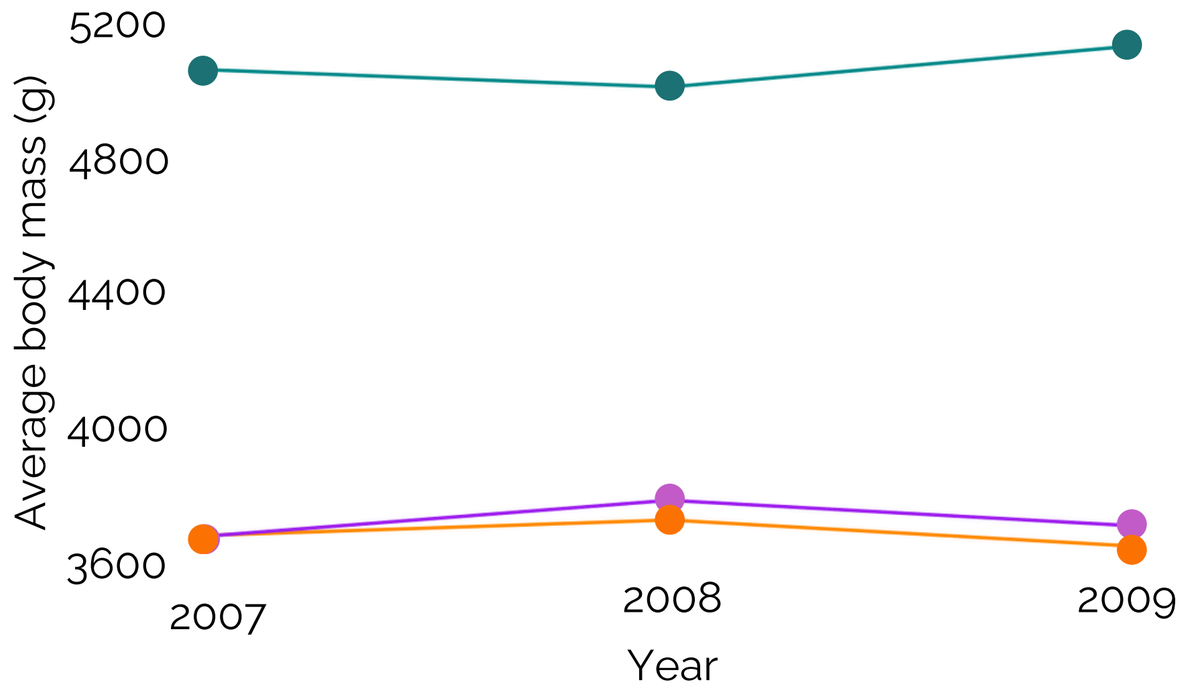


8 variables (n = 344 penguins)

The **palmerpenguins** data contains size measurements for three penguin species observed on three islands in the Palmer Archipelago, Antarctica.

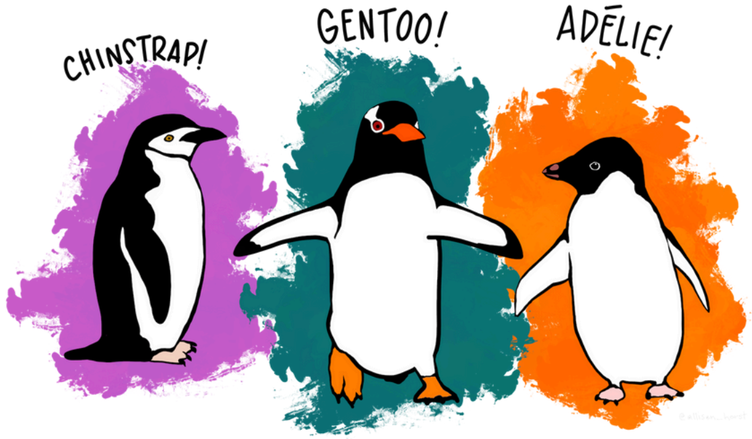
Species	Penguin species (Adélie, Chinstrap, Gentoo)
Island	Island in the Palmer Archipelago where observed
Bill length (mm)	Length of the penguin's bill (mm)
Bill depth (mm)	Depth (thickness) of the penguin's bill (mm)
Flipper length (mm)	Length of the penguin's flipper (mm)
Body mass (g)	Body mass of the penguin (g)
Sex	Male or female (some values missing)
Year	Year of observation (2007–2009)

LINE PLOT



These data were collected from 2007 - 2009 by Dr. Kristen Gorman with the Palmer Station Long Term Ecological Research Program, part of the US Long Term Ecological Research Network.

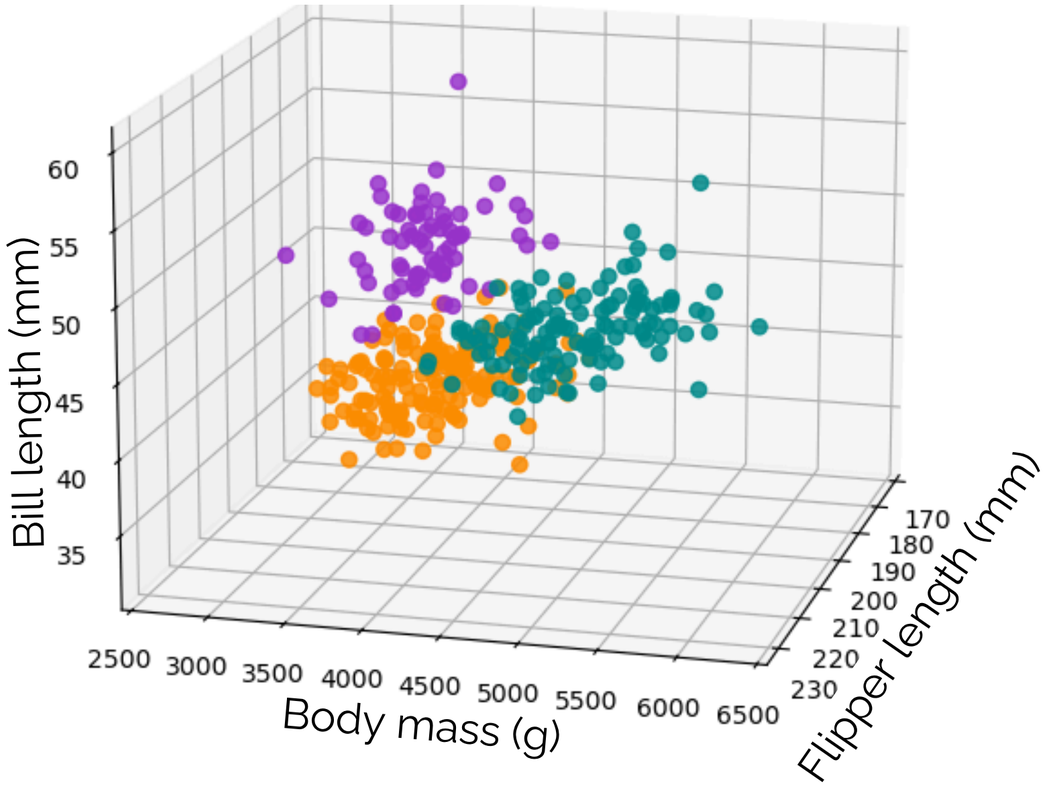
DATA VISUALIZATION



The **palmerpenguins** data contains size measurements for three penguin species observed on three islands in the Palmer Archipelago, Antarctica.

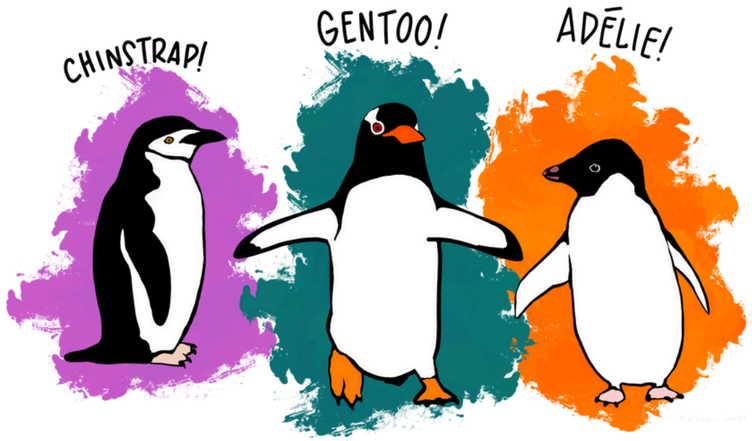
8 variables (n = 344 penguins)

Species	Penguin species (Adélie, Chinstrap, Gentoo)
Island	Island in the Palmer Archipelago where observed
Bill length (mm)	Length of the penguin's bill (mm)
Bill depth (mm)	Depth (thickness) of the penguin's bill (mm)
Flipper length (mm)	Length of the penguin's flipper (mm)
Body mass (g)	Body mass of the penguin (g)
Sex	Male or female (some values missing)
Year	Year of observation (2007–2009)



These data were collected from 2007 - 2009 by Dr. Kristen Gorman with the Palmer Station Long Term Ecological Research Program, part of the US Long Term Ecological Research Network.

DATA VISUALIZATION

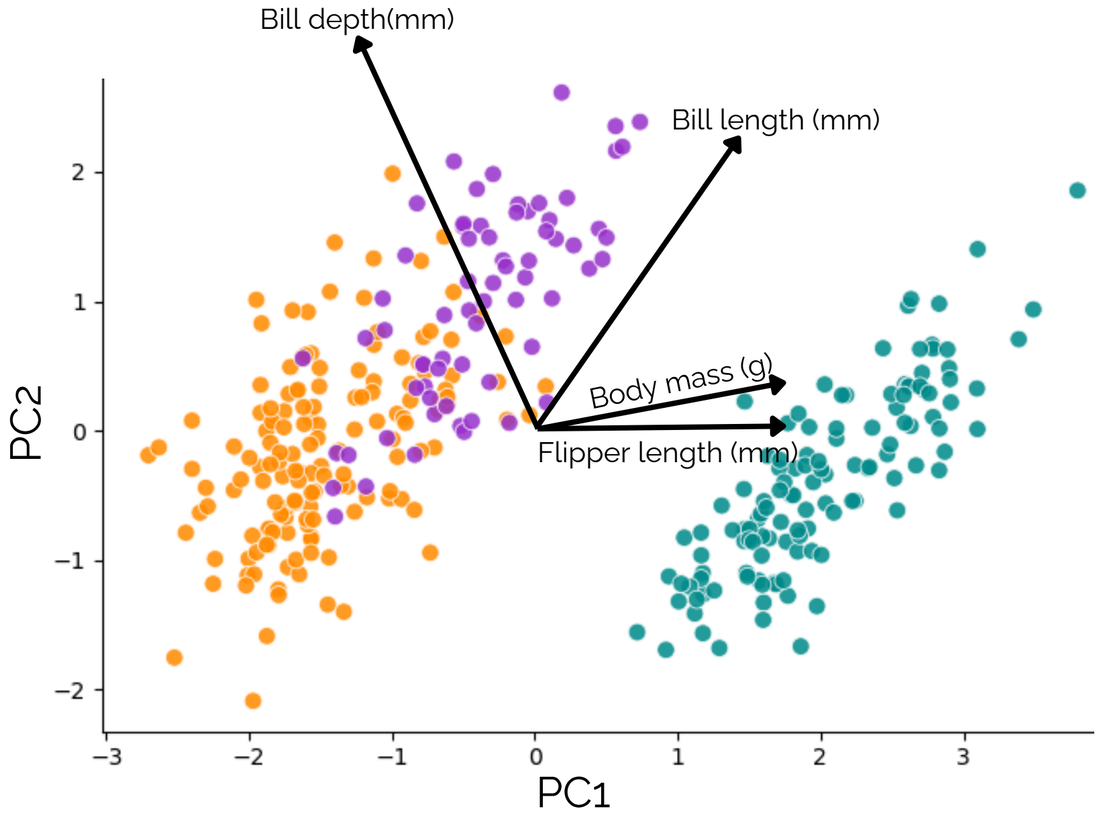


The **palmerpenguins** data contains size measurements for three penguin species observed on three islands in the Palmer Archipelago, Antarctica.

8 variables (n = 344 penguins)

Species	Penguin species (Adélie, Chinstrap, Gentoo)
Island	Island in the Palmer Archipelago where observed
Bill length (mm)	Length of the penguin's bill (mm)
Bill depth (mm)	Depth (thickness) of the penguin's bill (mm)
Flipper length (mm)	Length of the penguin's flipper (mm)
Body mass (g)	Body mass of the penguin (g)
Sex	Male or female (some values missing)
Year	Year of observation (2007–2009)

DIMENSIONALITY REDUCTION



These data were collected from 2007 - 2009 by Dr. Kristen Gorman with the Palmer Station Long Term Ecological Research Program, part of the US Long Term Ecological Research Network.