

Qualitative & Quantitative data



Learning intentions

We are learning about the types of data, specifically to understand,

- what is **quantitative** data, and that it can be continuous, discrete
- what is **qualitative** data, and that raw text data can be categorised to allow analysis

Background

Data is being created all the time, from phones, sensors all around us and the internet.

Data is everywhere.

Data facts are **distinct pieces of information** that are stored and formatted so that they can be automatically interpreted by a computer.



Why this is important?

Data science is about **trying to solve a problem.**

Whether that is understanding the scale of the climate emergency or tracking the feedback of customers, you can only solve your problem if you have **the right data in the right format** to analyse.

In this lesson we will look at how data is classified.



Why this is important?

It is important you are aware of the type of data you have, so that you can handle it correctly.



Your data may contain **dates, letters or numbers**, they might need to be handled differently.



The type of data will determine the maths you can do with it such as **add/divide the data**.



You might need to **manipulate it** (e.g. grouping raw text) before you start your analysis.



The type of data will determine what **type of graph** you can produce.

Show me...



Here are some examples of **why it's important**

Does calculating the average make sense?

"There were 3.5 people"



You can spot data that looks like
it is in the wrong place

name	age
Kim	34
Jamie	Brown
Lee	23

Example

You are looking at the data you hold for your clothes shop.
How would you expect these data items to look?

Data item	What would it look like?
People in the shop	Number
Descriptions of clothes	Words
Price of the clothes	Money (£)
Size of clothes	Number or words (10,14,18 or S,M,L,XL)



Your turn...



You are measuring the length of the rooms in your house.

With the data in these formats, would you **be able to calculate the average** room length?

Kitchen	= 1.25 m
Bathroom	= 19 tiles
Bedroom	= Two metres



Your turn...

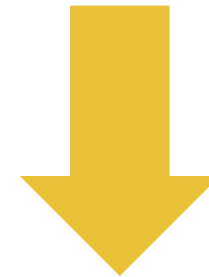


Would you **be able to calculate the average** room length?

No.

First, you would need to **transform the measurements into the same data types** (e.g. bedroom length from words to a number) to calculate the average.

Kitchen	= 1.25 m
Bathroom	= 19 tiles
Bedroom	= Two metres



Kitchen	= 1.25 m
Bathroom	= 1.83 m
Bedroom	= 2.0 m

Definition



Quantitative



Measures of values or
counts and expressed as
numbers

Show me...



Here are some examples of **quantitative** data



Date



Length of road



Pass rate of a test



Temperature



Number of people
on the beach



Number of candles on a
cake

Example

Quantitative

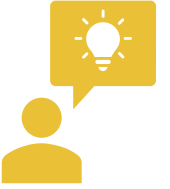
Measures of values or counts and expressed as numbers

What type of quantitative data could a restaurant hold?

- **number** of customers
- **price** of the food
- **volume** of milk held in the fridge



Your turn...



Which of these do you think are **quantitative** data types?

Number of carrots



Average rain fall



Amount of honey



Types of cars



Quantitative data

Measures of values or counts and expressed as numbers



Your turn...



Which of these do you think are **quantitative** data types?

Number of carrots



Average rain fall



Amount of honey



Types of cars



Number of carrots, **average** rain fall, and **amount** of honey are all quantitative data types because you can either measure or count them.

Definition



Qualitative



Descriptive, normally using words rather than numbers

Show me...



Here are some examples of **qualitative** data



Survey responses



Colours



Names



Article in a paper



Song titles



Days of the week

Example

Qualitative

Descriptive, normally using words rather than numbers

What type of **qualitative** data could a restaurant hold?

- **Descriptions** of the food on the menu
- Customer **comments**
- Which **days** they receive deliveries

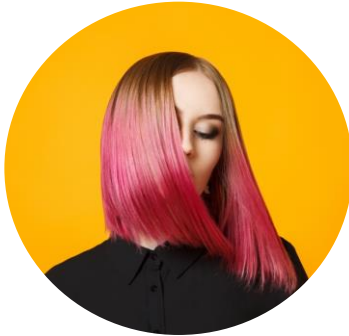


Your turn...



Which of these do you think are **qualitative** data types?

Hair colour



House style



Number of candles on a cake



Crops grown on a farm



Qualitative data

Descriptive, normally using words rather than numbers

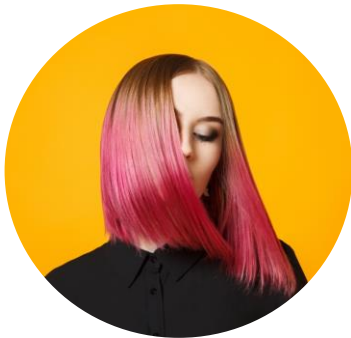


Your turn...



Which of these do you think are **qualitative** data types?

Hair colour



House style



Number of candles on a cake



Crops grown on a farm



Hair colour, House style and crops grown on a farm are all qualitative data types.

They are all described by words, e.g **black** hair, **detached** house, **wheat** in a field.

Understanding 'raw text' data

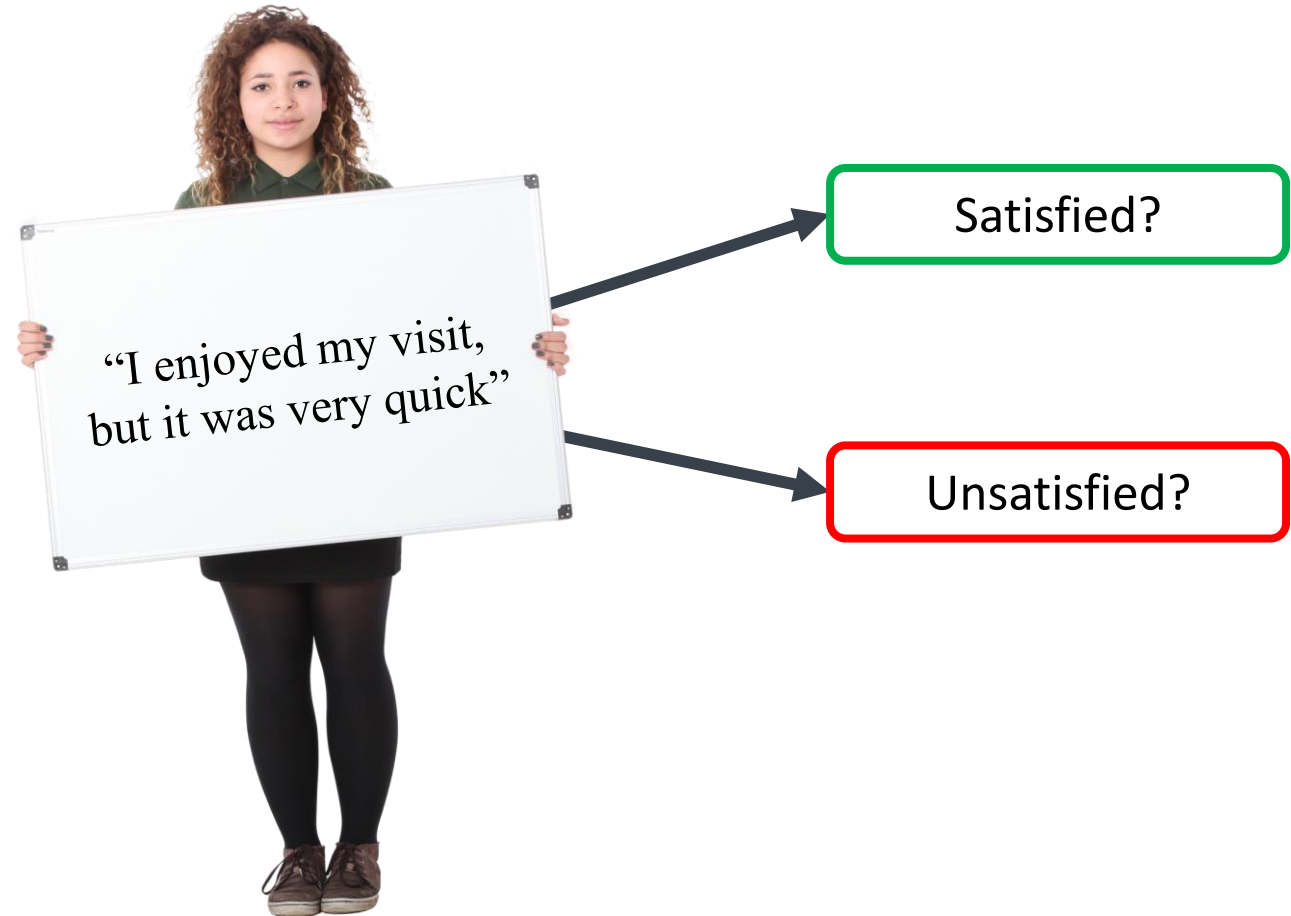
Raw text qualitative data is important as it allows researchers to **understand thoughts and feelings**, which could be missed by a quantitative data type.



Understanding 'raw text' data

Often in data science raw text data is **categorised** in order to facilitate analysis and reporting.

This must be done carefully so that the thoughts and feelings are not misinterpreted.



Quantitative & Qualitative Data

This mnemonic may help you remember the difference between **quantitative** & **qualitative** data.

quantitative



quantity



numbers

qualitative



quality



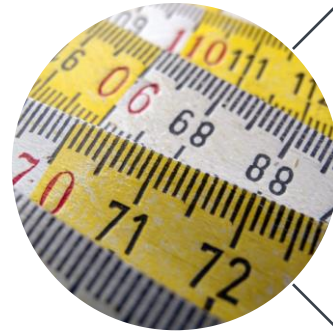
words (description)

Next steps

Complete **questions 1 to 6**
in **section 1** of the
'Quantitative & Qualitative' workbook.

Data categories

Quantitative data can be continuous (e.g. height) or discrete (e.g. number of people)



Continuous



Discrete

Definition



Discrete

Whole numbered data,
obtained by counting



Definition



Continuous

All possible values,
obtained by measuring



Show me...



These are **discrete**

Number of eggs for sale



Number of goals scored



Number of animals in a park



Shoe size



These are **continuous**

Average rain fall



Height of a mountain



Length of a room



Time to run a race



Example

Discrete Whole numbered data, obtained by counting

Continuous All possible values, obtained by measuring

You are **setting up your own café** and are thinking about all the data you could hold. **List the data** under the headings of,

Discrete

number of customers

number of tables in the
restaurant

number of customer reviews on
their website



Continuous

length of the tables

volume of milk held in the fridge

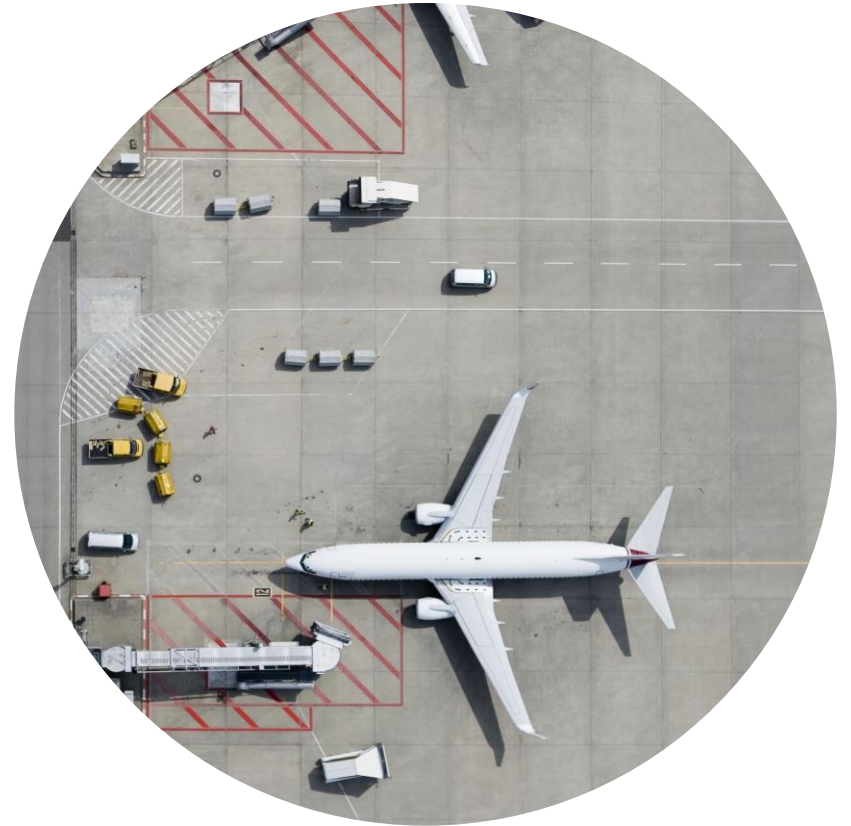
average amount of left-over
food



Your turn...



Why would the **number of planes** in an airport be a 'discrete' data type?



Your turn...

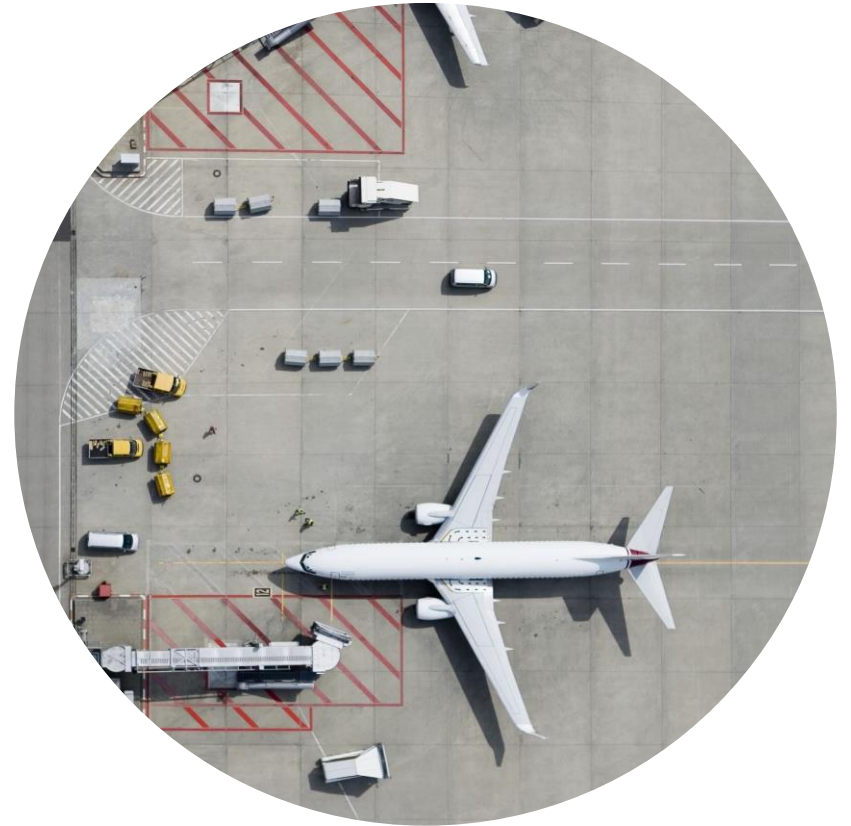


Why would the **number of planes** in an airport be a 'discrete' data type?

It is **quantitative** data.

It is obtained by counting.

It is **whole-numbered** data; you can not meaningfully have 1.56 planes.



Next steps

Complete **questions 1 to 7**
in **section 2** (discrete vs. continuous) of the
'Quantitative & Qualitative' workbook.

Learning checklist

I can *describe* the difference between qualitative and quantitative data.

I can *identify* continuous and discrete data.

How you can use this lesson



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