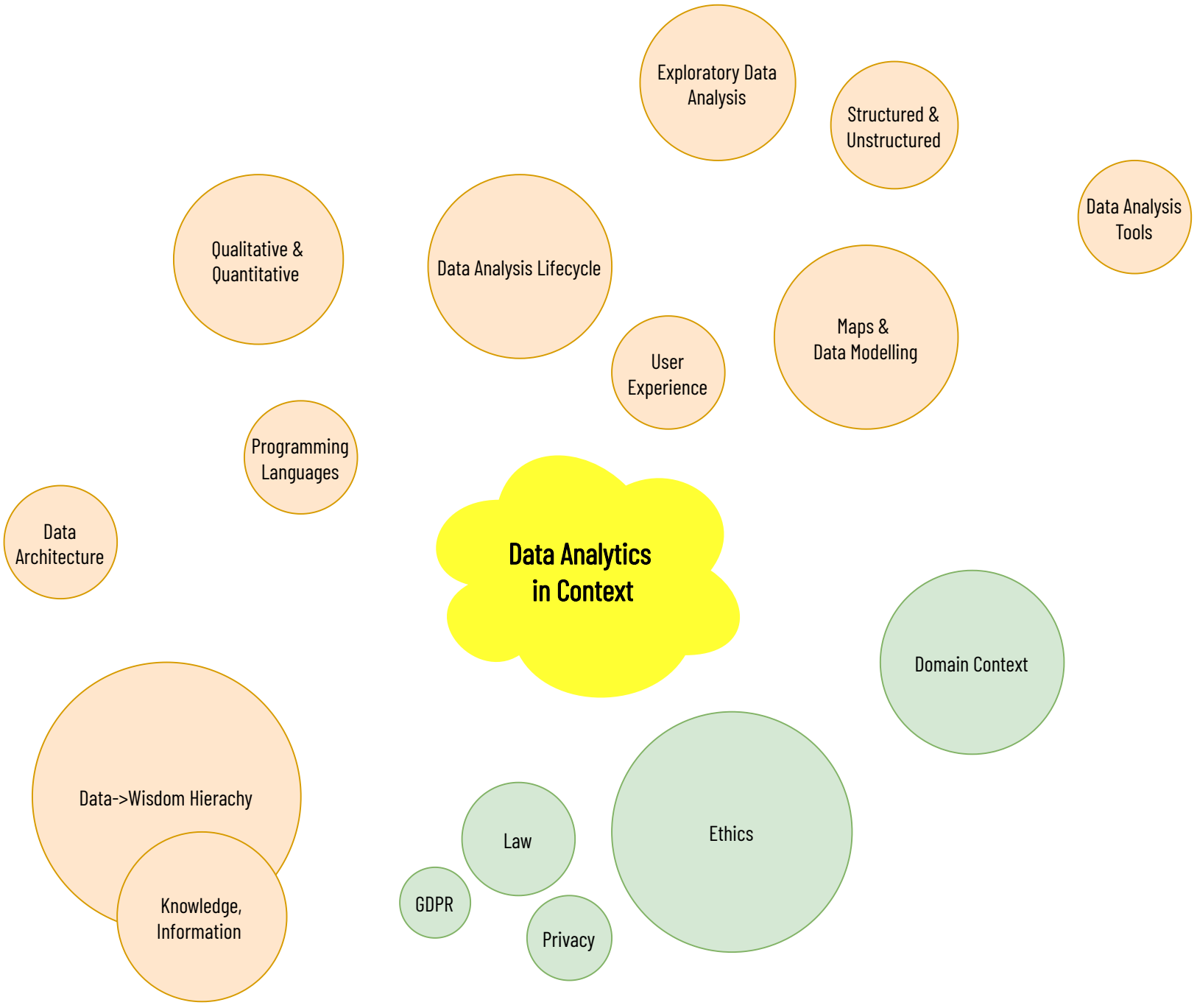
Lesson Plan: Key Activities
Introductions: Who am I? Who are you?
Review Prelearning: What have we learned so far?
Discussion: What is(n't) data?
How can data analysis go wrong? (20 -25min)
Interactive Review: Menti
Discussion: Principles of GDPR
What's your definition of ethics? (20 - 25min)
Individual: Read through some ethical questions and case studies
What's your interpretation of these ethical case studies? (20 - 25min)
Summary: What ethical rules should a data scientist follow? (10-15 min)

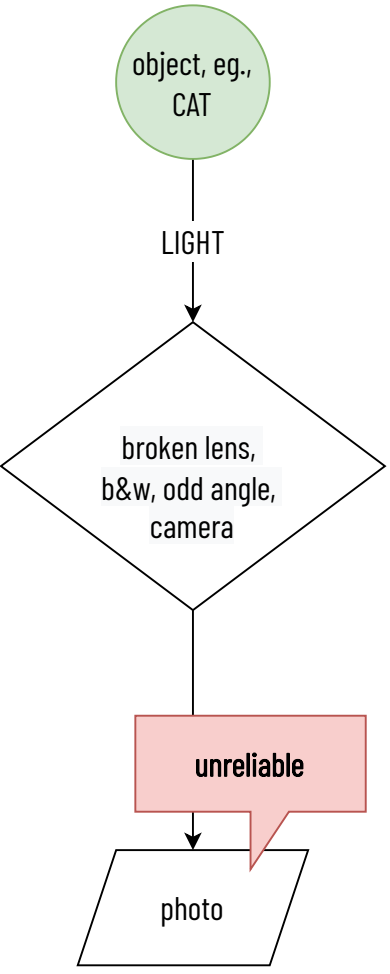
Data Analytics in Context

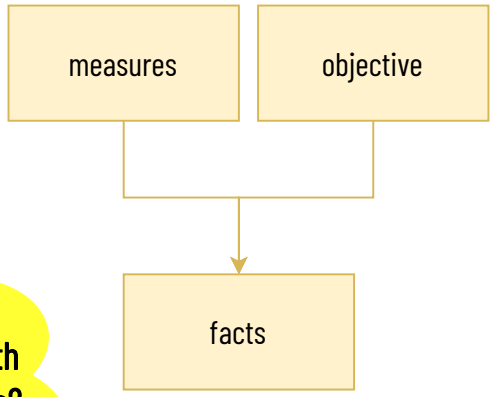
safeguarding@decoded.com

wellbeing: stress, overwhelmed

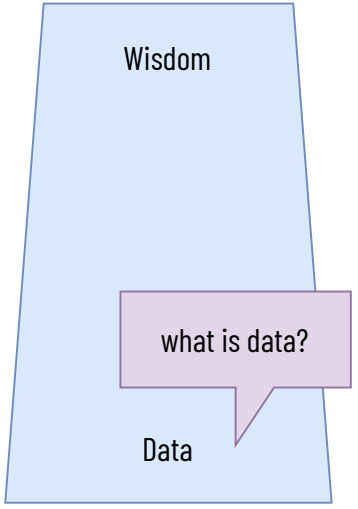
emotional, technical, educational


Exploratory Data Analysis
Structured & Unstructured
Data Analysis Tools
Qualitative & Quantitative
Data Analysis Lifecycle
Maps & Data Modelling
User Experience
Programming Languages
Data Architecture
Data Analytics in Context
Domain Context
Data->Wisdom Hierachy
Knowledge, Information
Law
GDPR
Privacy
Ethics





Can something be both objective & unreliable?



(wisely) action-guiding **reasons**

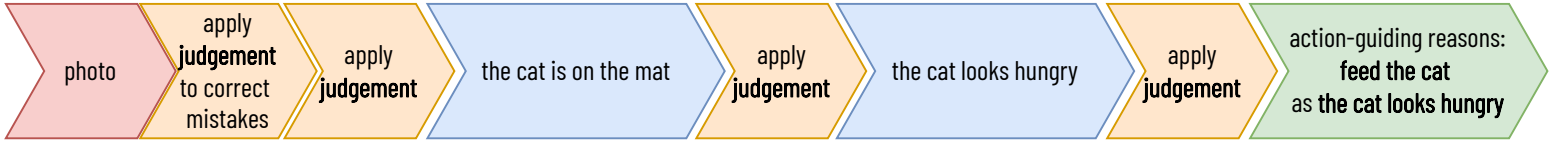
Knowledge, Information

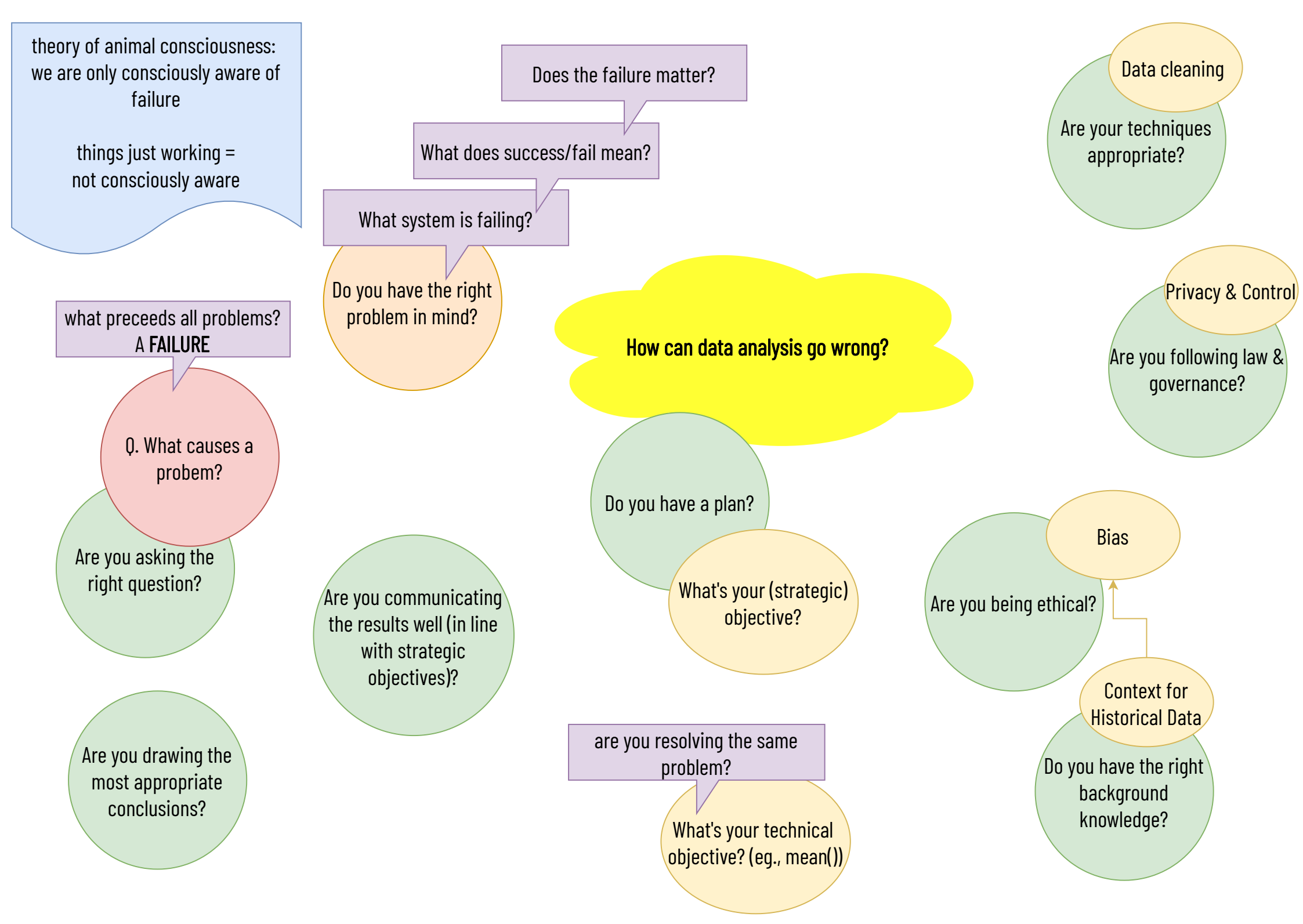
or worse: *wrong*

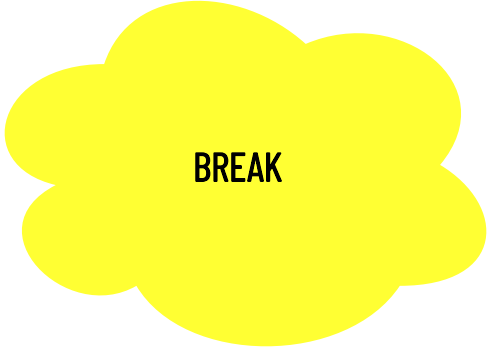
data alone isnt informative

why do we care?

What is(n't) Data?




theory of animal consciousness:
we are only consciously aware of failure
things just working =
not consciously aware
Does the failure matter?
What does success/fail mean?
What system is failing?
Do you have the right problem in mind?
Data cleaning
Are your techniques appropriate?
Privacy & Control
Are you following law & governance?
How can data analysis go wrong?
what preceeds all problems?
A FAILURE
Q. What causes a probem?
Are you asking the right question?
Are you communicating the results well (in line with strategic objectives)?
Do you have a plan?
What's your (strategic) objective?
Are you being ethical?
Bias
Context for Historical Data
Do you have the right background knowledge?
Are you drawing the most appropriate conclusions?
are you resolving the same problem?
What's your technical objective? (eg., mean())



RAISE HAND

Managing:
command, judging

suppose **I ask a person to account for themselves**?

what are **they** going to do?

Person who
is held to account

Provide an explanation/justification,
ie., an account of your behaviour

Responsibility

What is it?

Why do we care?

What is Accountability?

Consequences

holding a person to account requries them to provide a reasonable explanation of their behaviour/actions, etc.

& then some consequences?

The UK GDPR sets out seven key principles:

- Lawfulness, fairness and transparency
- Purpose limitation
- Data minimisation
- Accuracy
- Storage limitation
- Integrity and confidentiality (security)
- Accountability

What problems are there
in data science,
with holding
any *decision-making process*
to account?

Who's the person
making the
decision?

Eg., there is no person.

Eg., AI says
NO BANK LOAN

Group Defintions

Ethics is about how our morals guides our actions

A framework of rules to guide people to make decisions that are beneficial to the most people.

Codifying and justifying morals so that people are treated in a way that they are happy with.

good ethics in data is applying moral principles during the data life cycle, ensuring maximising value by minimising exposure

A framework of rules to guide people to make decisions that are **beneficial** (to the most people).

Codifying and justifying morals so that people are treated **fairly**

(in a way that they are happy with).

this seems an *unethical reason to be good*

They care about their (brand) image

How does ethical reasoning align with organizational needs?

Do organizations have ethics?

What is Ethics?

Systems and processes that govern ethics

would we say a car is ethical?

Does it make sense to attribute ethical reasoning *to* organizations?

NO

but it doesnt matter..

does ethical *apply* to an organization?

If so, when are organizations ethical?

YES

are **we** just making this judgement ?

Seems like: charities are ethical?

Seems like: Amazon is unethical?

What is the difference between Ethics and Governance?

By design, are non-profit, so it's harder for the charity to pursue non-ethical

is a collection of people a person?

problem: free speech rights to companies, well if so, then they can spend as much as they like on political speech

are we just being nice and tolerant?

Is ethics subjective?

YES?

WHY?
People disagree and seem to come to no common view point

NO

BUT..
Maybe we have underlying objective principles that are commonly agreeed

Eg.
principle of self-defence
self-defence is justified in some cases

Eg., amazon is very effective at allocating resources,
but may use "invasive" data collections

(wiki): Ethics or moral philosophy "involves systematizing, defending, and recommending concepts of right and wrong behavior"

Variations on the *objective* principle are *tastes?*

US: stand-your-ground
(self defence *easy* justification)

UK: difficult
(self defence *hard* justification)

Ethical questions

1. If a self-driving car hits a pedestrian, who should be held legally or morally responsible?

2. Should insurance premiums be based on characteristics such as age or gender, if those characteristics can be used to accurately predict likelihood of accidents?

3. Should people have the right to have accurate information about their past (criminal/employment/social history) forgotten and removed from data stores?
4. Should you have any rights over data collected about you in public (e.g. CCTV footage)?

5. Can the use of autonomous military drones ever be justified?

https://www.bbc.co.uk/news/technology-35902104

https://www.bbc.co.uk/news/technology-47638916

https://www.bbc.co.uk/news/uk-politics-41996422

What do you think about these ethical questions and case-studies?

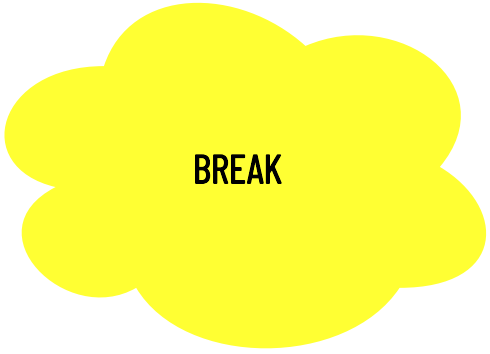
Case Study 01: Education

Alcuna Academia is a not-for-profit trust that runs a number of private schools in South West England. They have been approached by Zenitrex Analytics, a US-based startup on a mission to 'disrupt the education industry and bring learning into the 21st Century'. Zenitrex Analytics proposes installing a series of 'tracking stations' around the schools administered by the trust. These would track student movement and attendance around the schools through both manual student sign-in at particular locations and automated tracking of WiFi-enabled devices.
The data collected would be used in a series of predictive models designed to identify potential discipline problems - such as truancy, poor attendance, or even bullying amongst the student population. These models would form a key part of an early-warning system, alerting the school staff to developing problems.

After an initial trial period with the schools connected to the trust, Zenimax Analytics plans to offer this service as a product to other institutions of various types. For their participation in this scheme, Alcuna Academia would receive a one-time payment, free installation of the tracking stations, and a two-year free subscription to the data collection and prediction services.

Case Study 02: Human Resources

Palanquin Employment is a recruitment agency that wants to streamline the hiring process. Initially based in South Africa, they now have offices across the Southern Hemisphere and have recently begun expanding into North America. Over the forty years that Palanquin has been operating, they have collected a vast amount of information - in various formats - on job applications and the success of candidates. Using this information, Palanquin intends to build predictive models to automatically assess candidates against job descriptions and recommend them for interview only if they are predicted to succeed. Job applicants will be assessed based on written materials, skills-based challenges, and video submissions; this data will be used to predict employee success, attitude, and culture fit, leading to a final accept/reject decision.
Palanquin calculates that the use of this service - after initial setup costs - will significantly reduce expenses, enabling the company to rely on automated systems and radically reduce the number of internal staff. Additionally, the curated high-quality applicant datasets could potentially provide a second revenue stream, with access sold to research institutes and other recruitment agencies.



RAISE HAND

Eg., A COVID case.

During COVID the government used an "*algorithm*" to determine a grade.

This algorithm knocked a person down three grades, despite A* performance — due to **POST CODE.**

Using teacher predictions, A* -> D -> A*

newcastle: DD**DDEDDCA*D**DDE

postcodes

westminister: A**AAAA*DCA***

high crime

most of the crime data comes from areas *historically* **policed**

A city map

low crime

STATISTICALLY ACCURATE (UNBIASED STATISTICALLY)

high crime

police get sent here

what areas (eg., in the US) have *historically been highly policies?* ethnic minorities, black

low crime

STATISTICALLY ACCURATE (UNBIASED STATISTICALLY)

low crime

police get sent here

high crime

does a contemporary police force need to be racist, for its decisions to be racist?

How can data science go wrong?

measurements (data)

mean(), median(), mode()

decision based on a mean()

prepared data is *where* the intelligence lies

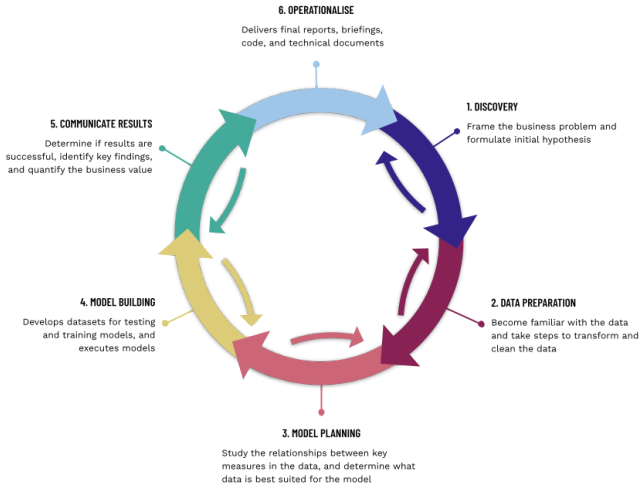
What principles should govern data science?

when should we use automation vs. assistance?

Assistance: provide a human being with information using AI

Automation: replace a human being with AI

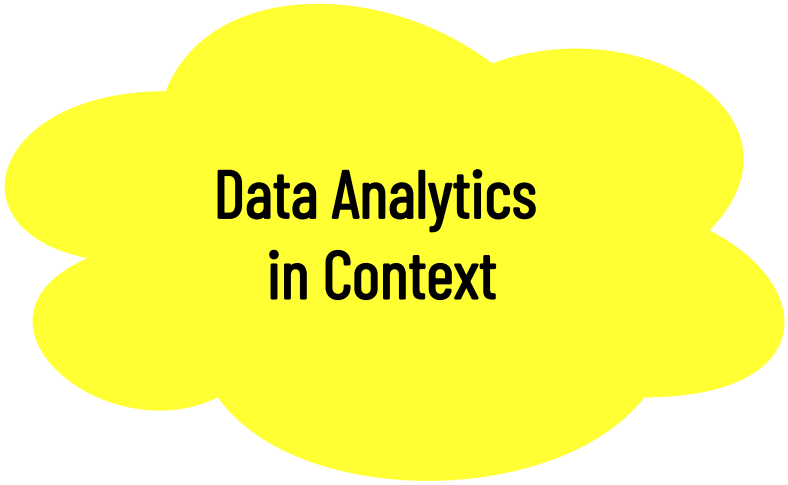
Augmentation: part of the decision is AI, part of it is human



- Relevant stakeholders are often ignored/neglected
- Cleaning & transforming data always involves some data loss
- The choice of modelling techniques can cause issues (e.g. black-box options)
- The training of models and the data selected can result in biased results
- 'Successful' is a fascinating term: to who? Measured how?
- Legal requirements around anonymisation/preservation of records

How will a data scientist behave at every stage of the lifecycle in order to avoid/support the issues we've discussed?

1. Complete the workshop reflection activity
2. Complete the **online practice**
3. Schedule a **mentor call**
4. *Complete any outstanding projects/assessments*



6 weeks from launch day to set up mentor call

Feel free to reach out.