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Advanced Data Science

Topic 11b – Part 6

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1. What We'll Cover

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The aim: to provide a overview of some of the ethical issues faced when applying data science, why these are important, and how to ensure responsible working moving forward.

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2. What are Ethics?

Credit: Tedx, Dr. Michael D. Burroughs

3. What are Ethics?

- Ethics is a branch of Philosophy - it systematizes right and wrong.
- Deciding right from wrong is tricky. It involves choosing a metric to compare against, such as the "greatest good" - the best behaviour yields the greatest good.

4. What are Ethics?

- Stoicism - behaviour that brings about contentment and serenity achieves the greatest good.
- Hedonism - behaviour that maximizes pleasure and minimizes pain achieves the greatest good.
- Utilitarianism – behavior that maximizes a positive effect, e.g. happiness, achieves the greatest good.
- This isn't a full ethics course, so we can't review all the theories.
- That said, we'll press on and use utilitarianism as our focus point.

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5. Utilitarianism

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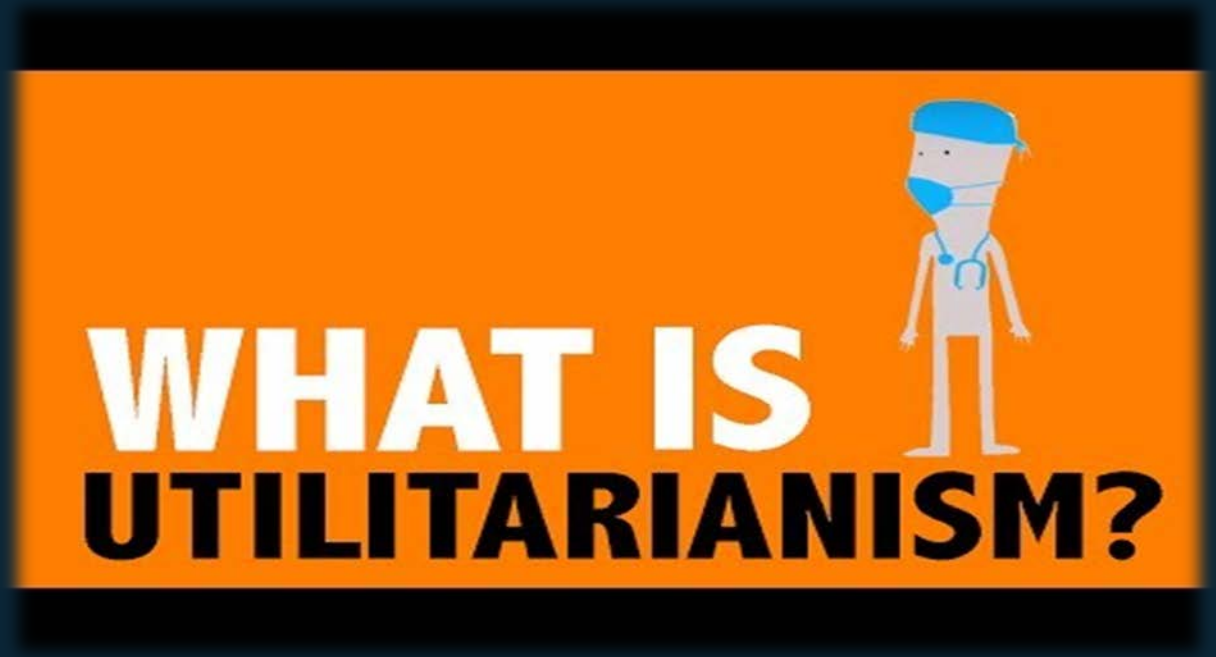
Part 1

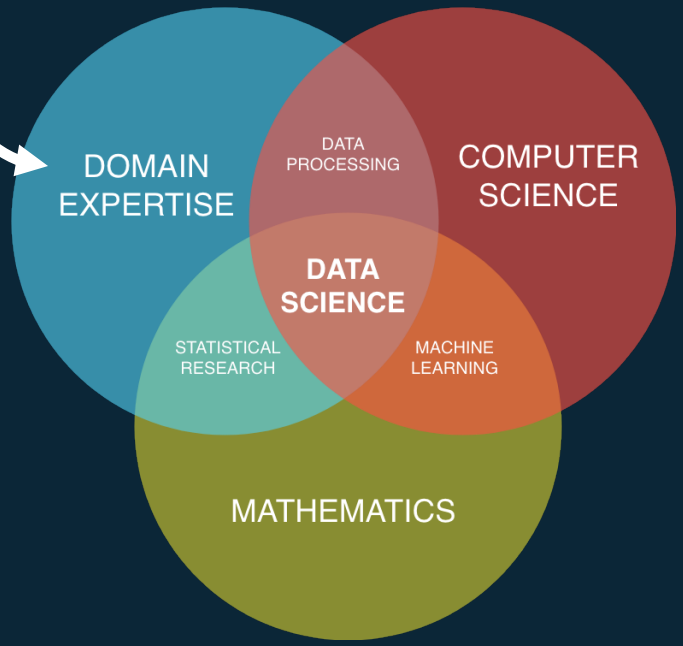


Part 2

Credit: Wireless Philosophy, Julia Markovits

6. Relation to Data Science

Ethical questions related to the application of domain expertise to problems at hand.



Credit: Shelley Palmer & Crate.io

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7. Relation to Data Science

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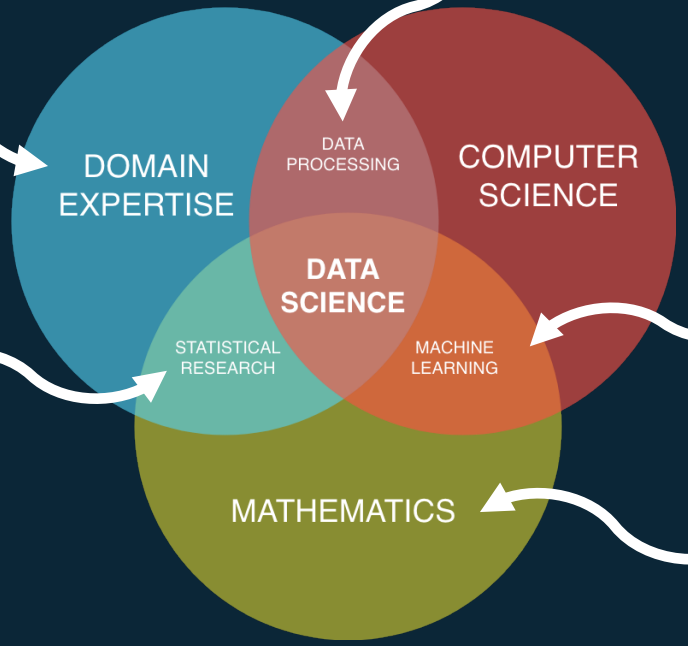
The way in which data is collected, processed, cleaned.

Ethical questions related to the application of domain expertise to problems at hand.



Questions surrounding application of ML and A.I. in general.

Ethical questions related to research goals and methods.

Ethical questions related to the application / use of statistics.

Credit: Shelley Palmer & Crate.io

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8. Importance & Fairness

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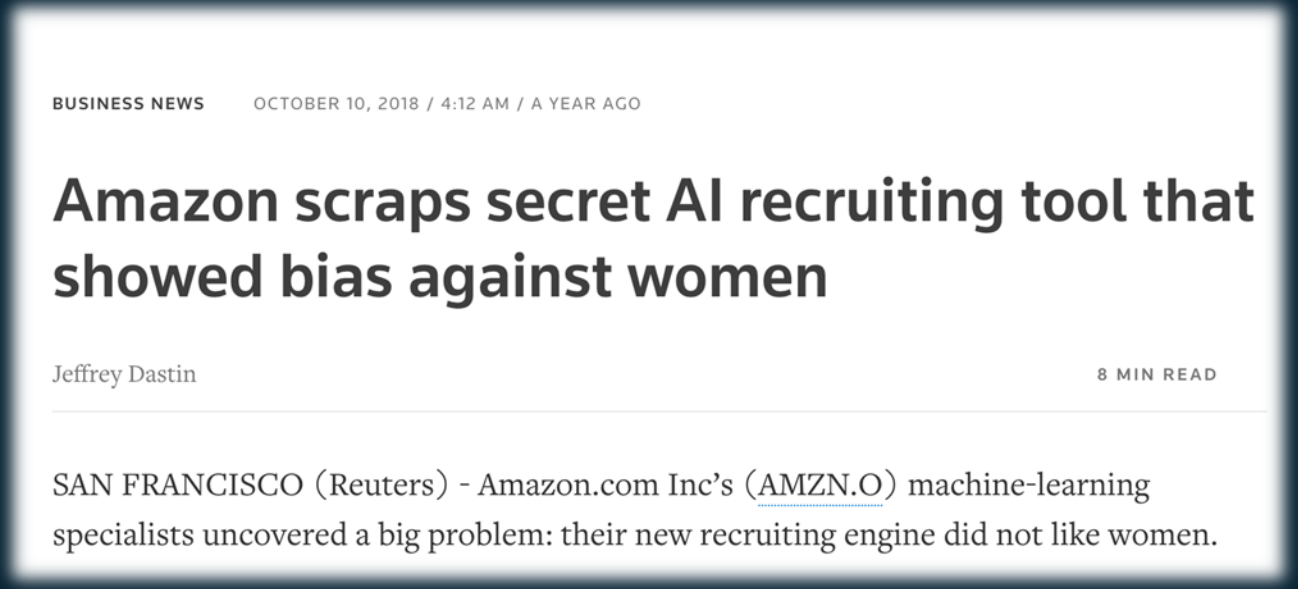
- Ethics becoming increasingly important as we relinquish human decision making responsibilities to algorithms.
- These systems must operate in an ethical fashion.
- Lets' avoid the “tyranny of algorithms”.
- Mistakes have already been made. Perhaps unknowingly, a utilitarian style approach to building automated systems has been adopted by many.
- This is because learning systems are usually trained with a singular purpose in mind – to achieve the best predictive accuracy. Consider an example:



BUSINESS NEWS OCTOBER 10, 2018 / 4:12 AM / A YEAR AGO

Amazon scraps secret AI recruiting tool that showed bias against women

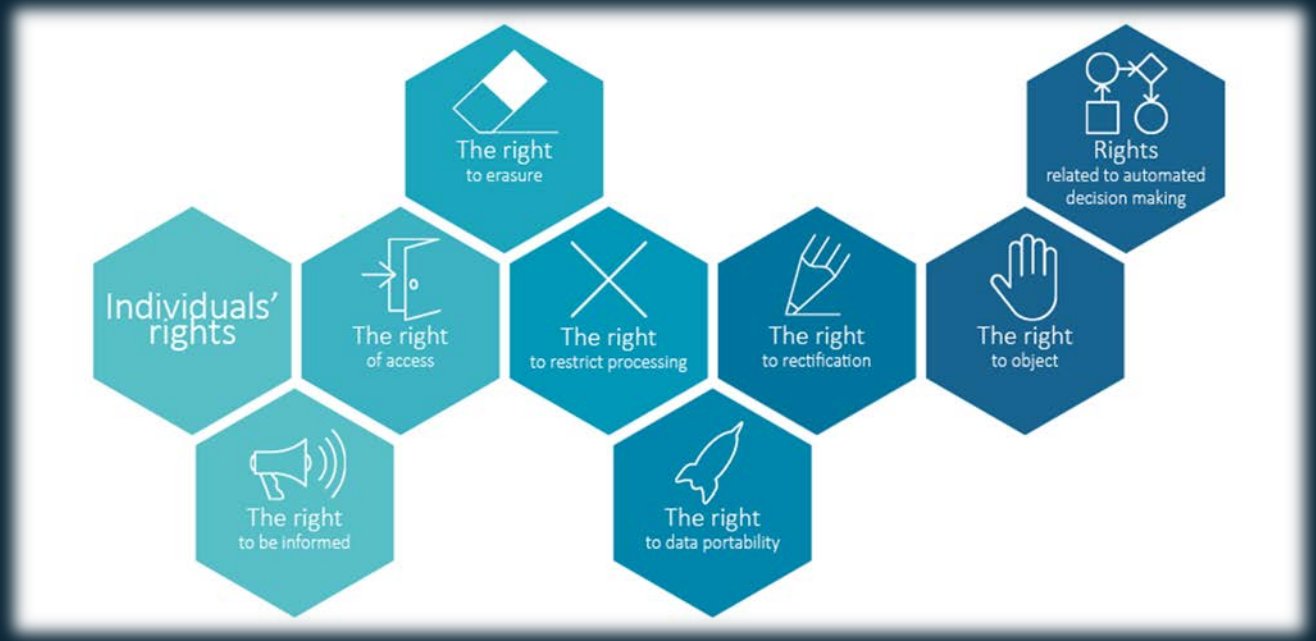
Jeffrey Dastin 8 MIN READ

SAN FRANCISCO (Reuters) - Amazon.com Inc’s (AMZN.O) machine-learning specialists uncovered a big problem: their new recruiting engine did not like women.

Credit: Reuters

9. New Framework

- How long it can be kept.
- That it should be maintained in a secure manner.
- That it's integrity and data validity must be preserved.
- That our consent must be sought before that data can be used.
- The right to be Informed.
- The right of access to our data.
- The right to erase data held about us.
- The right to demand our data repaired if erroneous
- The right to object
- Plus rights related to how automated systems use our data.



Credit: European Progress

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9. GDPR

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- GDPR is a legally enforceable framework that complements the ethical considerations we should already be making as data scientists.
- With GDPR in place, we can ask a question of ourselves when facing a data science problem - is it ethically acceptable and legal to apply data science to the problem?
- Is the potential application fair?

Credit: Channel 4 News

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10. Consent

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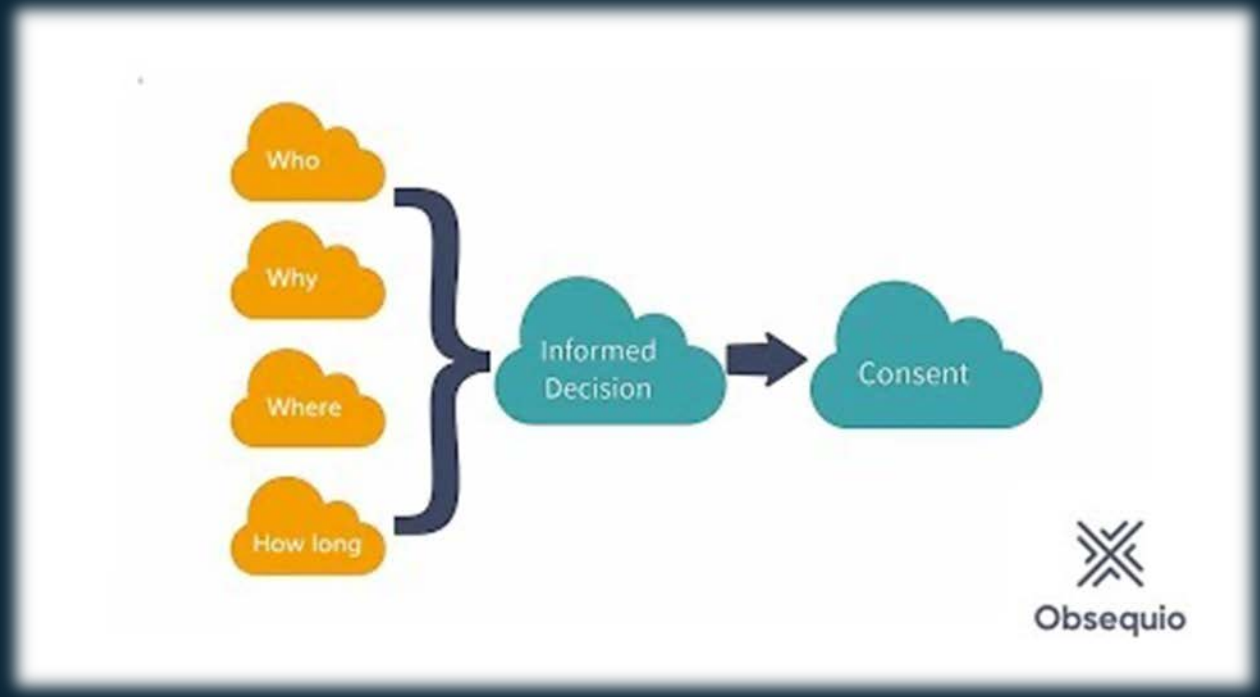
- Consent is becoming an increasingly important issue in data science.
- If data is being collected about us all the time, does that mean we consent to all it's potential uses?
- GDPR would now suggest that direct consent is needed if the data is to be processed in a new way.
- What about data stored in mathematical models – users have rights over how there data is used here too.
- Consent is at the heart of any data science activity that involves people and their data.



Credit: Obsequio Software

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11. GDPR & A.I.

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- GDPR presents some unique challenges to A.I.
- One important issues is related to the training of intelligent algorithms. These learn from vast quantities of historical data.
- The data is used to build what we called models.
- Under GDPR these models are derivates of user data, thus users have rights over them.
- This can raises ethical questions.

Credit: Alan Turing Institute

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12. Security, Privacy, Anonymity

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Credit: Ted Institute, Marie Wallace @ IBM

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13. Legal Consequences

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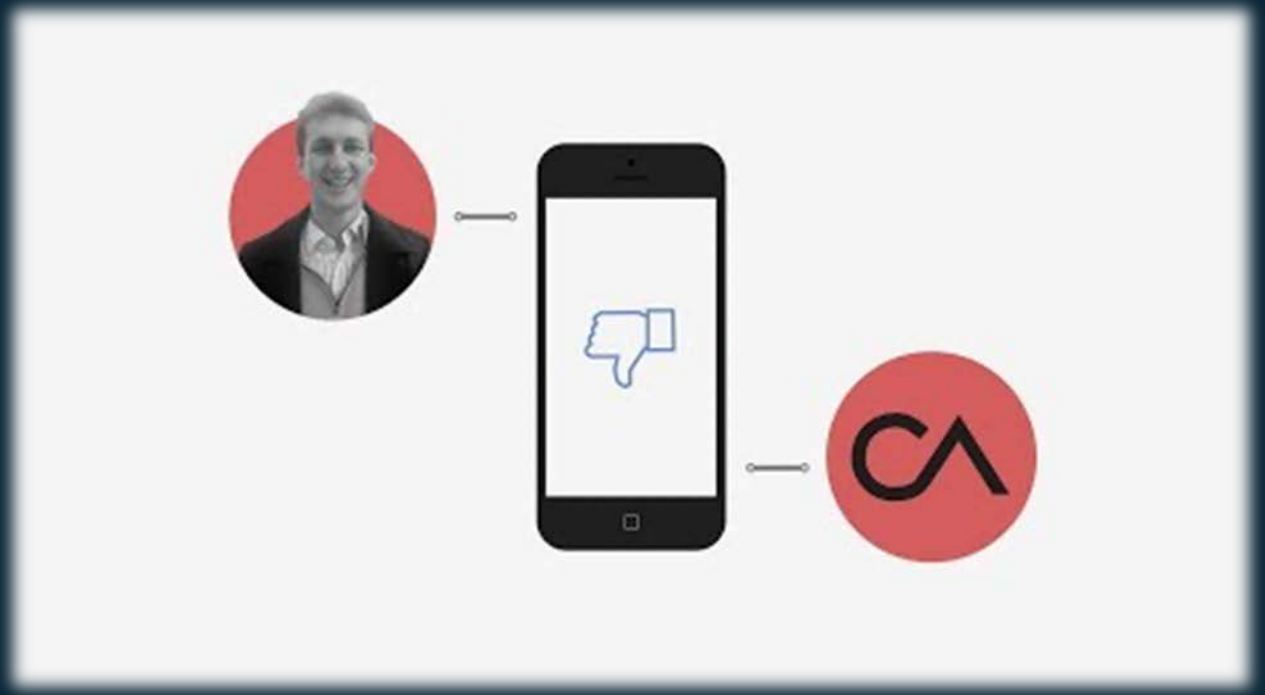
- When privacy, and anonymity are are overlooked, things can go very wrong.
- For example, the Cambridge Analytica scandal.
- Here a company exploited multiple data sources to probe & manipulate our emotions.
- The legality of these actions has been questioned & fines levied – yet the ethical impact is profound.
- It has raised concerns about the validity of elections, discourse, and the stability of our democracy.
- All brought about by a small number of data scientists.



Credit: New York Times

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14. Ethical Consequences

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Credit: The Guardian

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15. Code of Ethics

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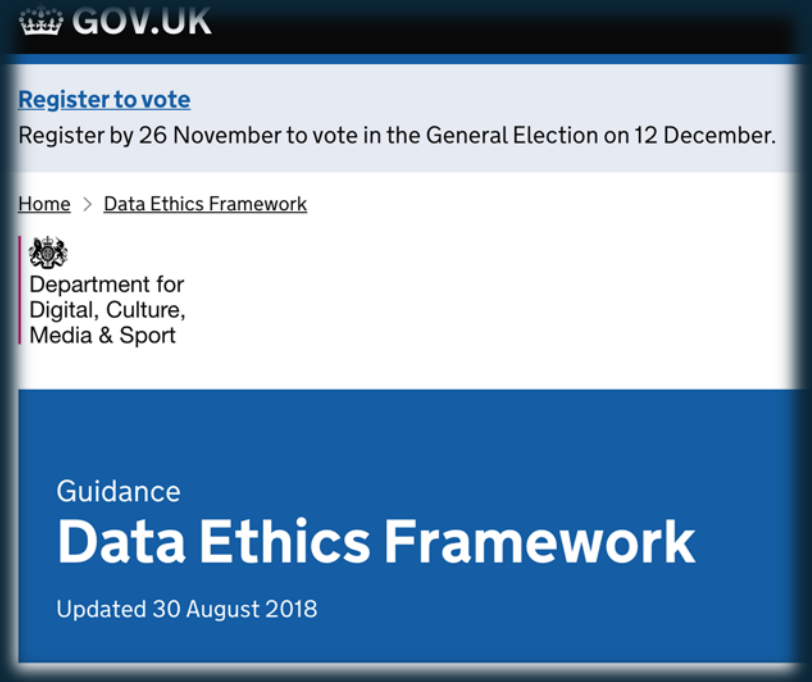

Credit: Inside Bloomberg

16. Summary

We've considered:

- **What Ethics is.**
- **Covered some introductory ethical theories.**
- **Explained the importance of ethics in data science.**
- **Been made aware of the legal frameworks within which we should operate ethically.**
- **Heard about GDPR, codes of ethics, and the consequences of discarding ethical. considerations.**

1. Legal Framework (GDPR) → **2. Code of Conduct** → **3. Governmental & Personal Ethical Framework**

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17. Resources

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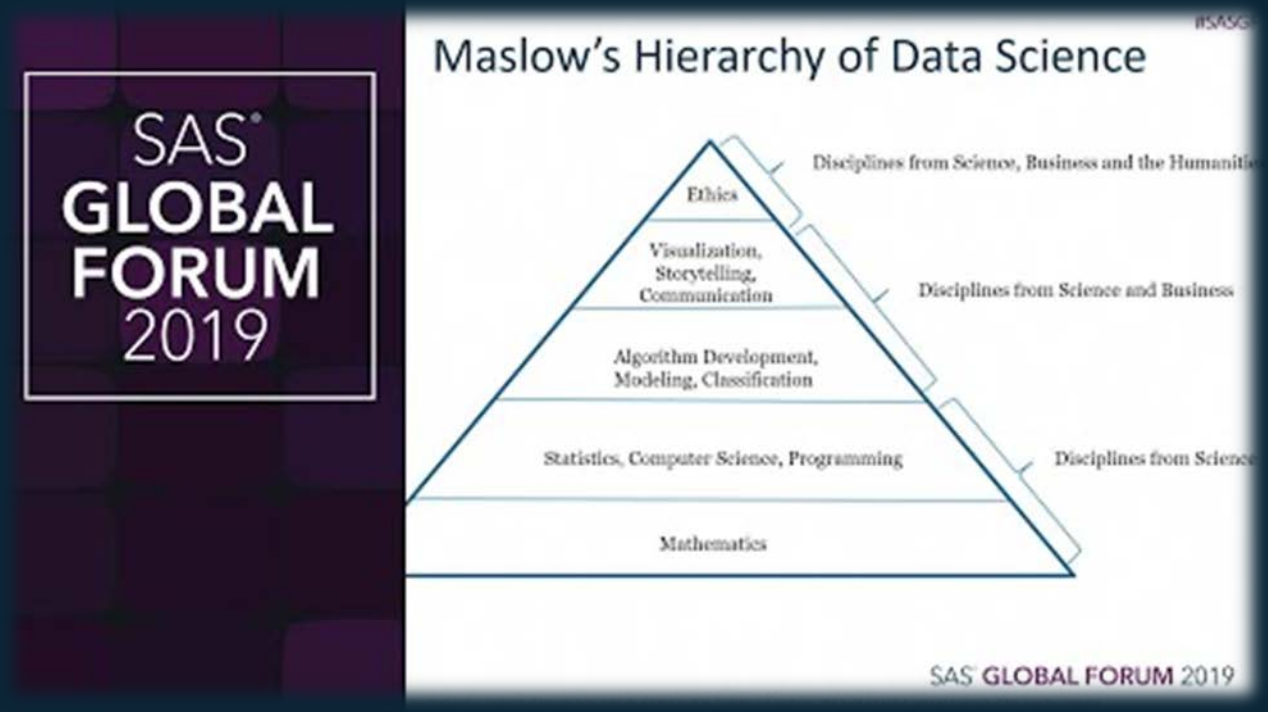

Credit: SAS Users

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