



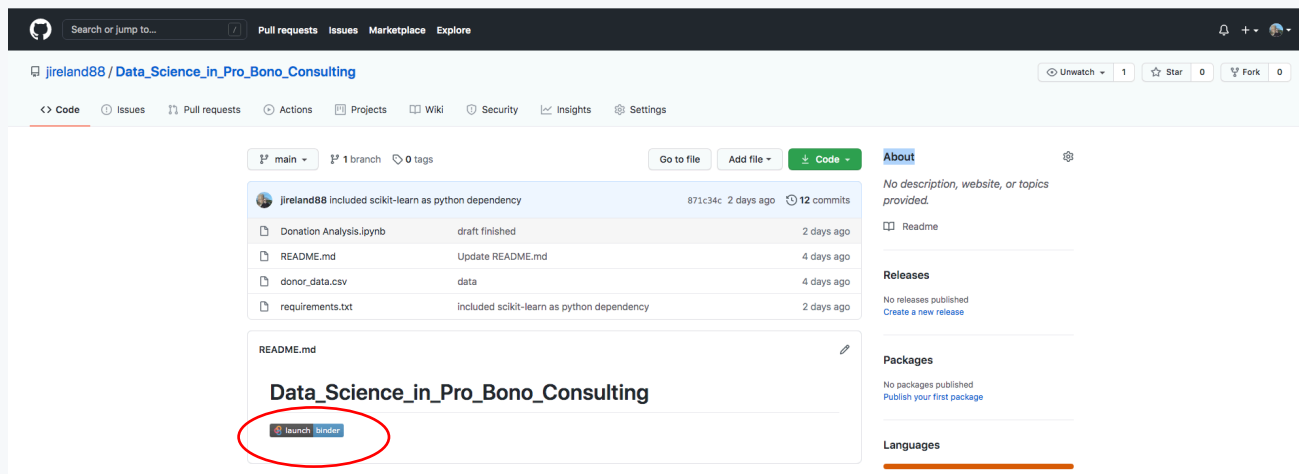
180Degrees  
CONSULTING

# BEFORE WE KICK OFF



## Instructions:

1. [https://github.com/jireland88/Data\\_Science\\_in\\_Pro\\_Bono\\_Consulting](https://github.com/jireland88/Data_Science_in_Pro_Bono_Consulting) (Link in chat)
2. -> Scroll to the bottom and press “Launch Binder”
3. -> Donation Analysis.ipynb





# SESSION OVERVIEW

- 180 DC Bristol
- Data Science Overview
- Interactive Walkthrough
- What to Do Next
- Q&A

# 180 DEGREES CONSULTING BRISTOL

- Aug 2019 • Founded
- Nov 2019 • Launched the Data team
- Apr 2020 • Launched CSRN
- Dec 2020 • 'Most Innovative Branch' award
- Feb 2021 • 60 charities and NGOs helped

student  
minds



THE UK'S STUDENT  
MENTAL HEALTH CHARITY



CENTRE FOR  
THRIVING  
PLACES  
The new name for HAPPY CITY





# DATA SCIENCE OVERVIEW

# WHAT IS DATA SCIENCE?

- Data science: applying the scientific method to extract insights from data.
- These insights can then be used to create more effective/bespoke solutions within management consulting.
- Data analysis has always been a key part of consulting. The introduction of data science represents a shift to more advanced techniques such as Machine Learning and Natural Language Processing.
- Also, it represents a technology shift from Excel to Python/R where this more complex analysis is more easily completed.

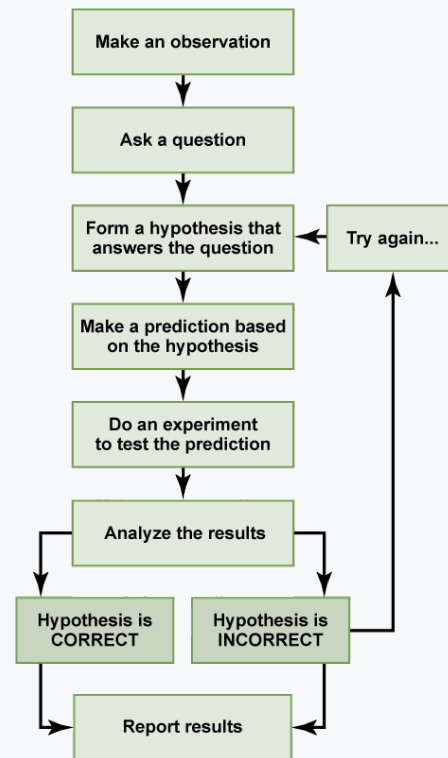
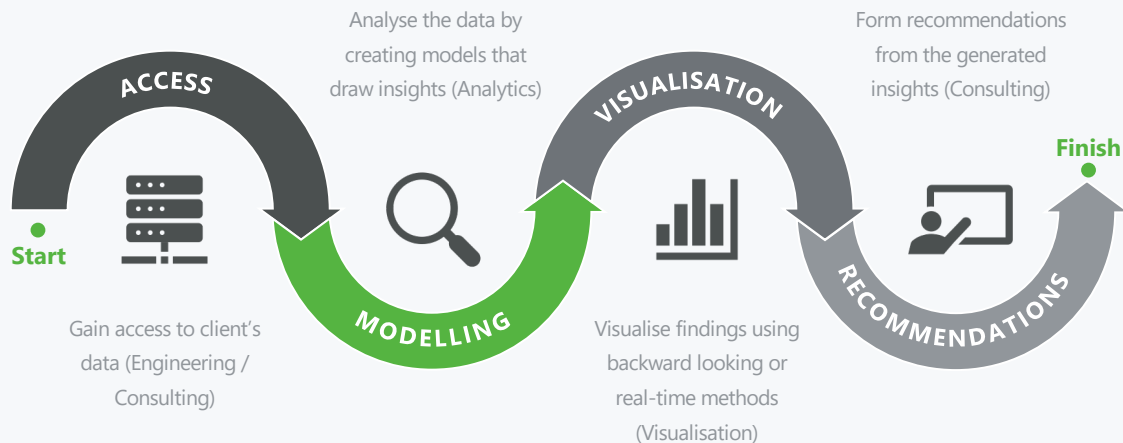



Image credit: [lumenlearning.com](https://lumenlearning.com)

# DATA SCIENCE PROCESS



# WHY DID WE LOOK TOWARDS DATA SCIENCE?

- Data science is clearly creating a stir in business, with 53% of companies utilising big data as of 2017 (Forbes)
- Data science works – Quantum Black, Quantitative Finance, Intrinsic to the business model of FAANG 
- Charities don't have the resources / competencies to harness data themselves
- 180 Degrees Consulting is a fantastic network of students helping charities but had limited capacity to do anything significant
- Data Science societies tended to focus on training rather than real world, practical projects
- There was a gap in every relevant market and an **opportunity to provide massive value to non-profit organisations**





# CENTRE FOR THRIVING PLACES - HAPPY CITY

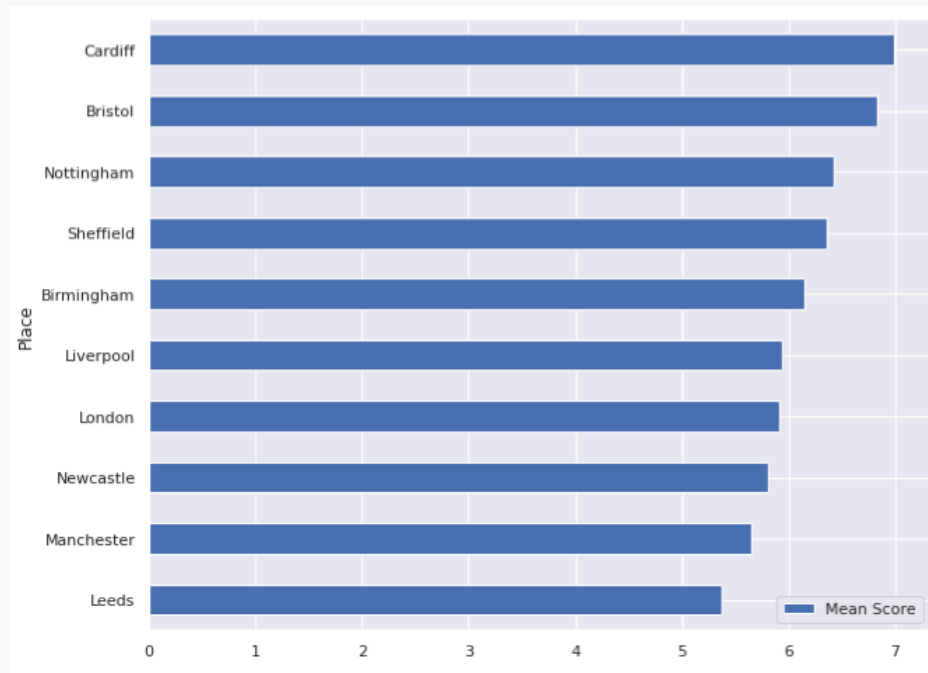


**Happy City:** A charity that builds and uses metrics for city performance to advise local governments on improving their local area.

**Our Insight:** Happy City were Overlooking people's happiness on social media.

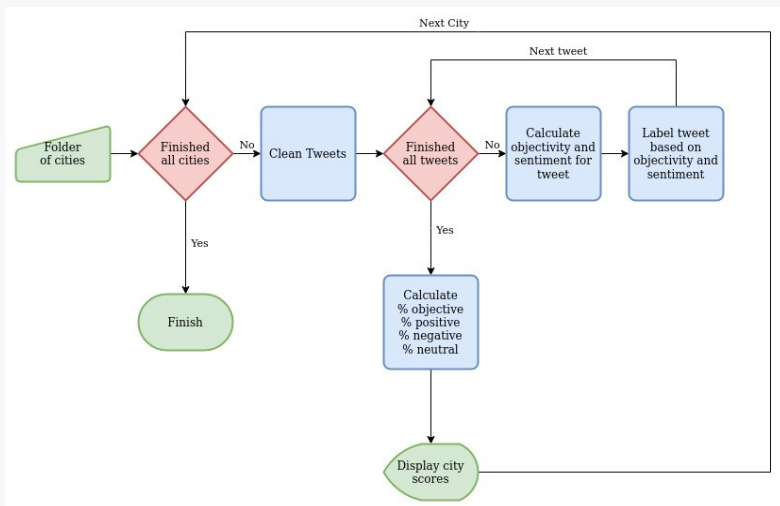
**Project:** Building a system that downloads tweets from a given region and runs sentiment analysis to investigate the positivity of the tweets from that area.

**Takeaway:** Our first NLP venture. Data Science is still very new, therefore, there was a process of solving the problem then discovering whether we can build the solution

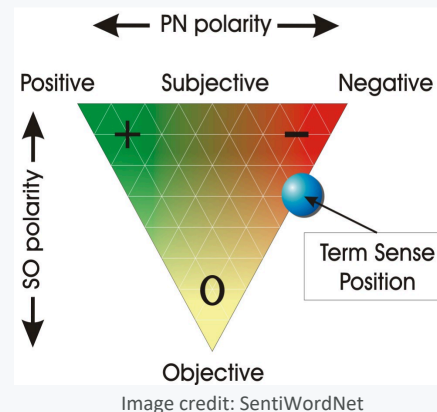


# SENTIMENT ANALYSIS

Sentiment Analysis forms part of **natural language processing (NLP)** - an area of data science that deals with understanding human communication



Goal - to determine the positivity of text



We can only assign a measure of positivity if the text is sufficiently subjective. Plainly, we must determine a threshold for subjectivity and classify text as positive or negative if it's objectivity score is above this threshold.

# MORE PROJECTS – STUDENT MINDS AND QUARTET CF



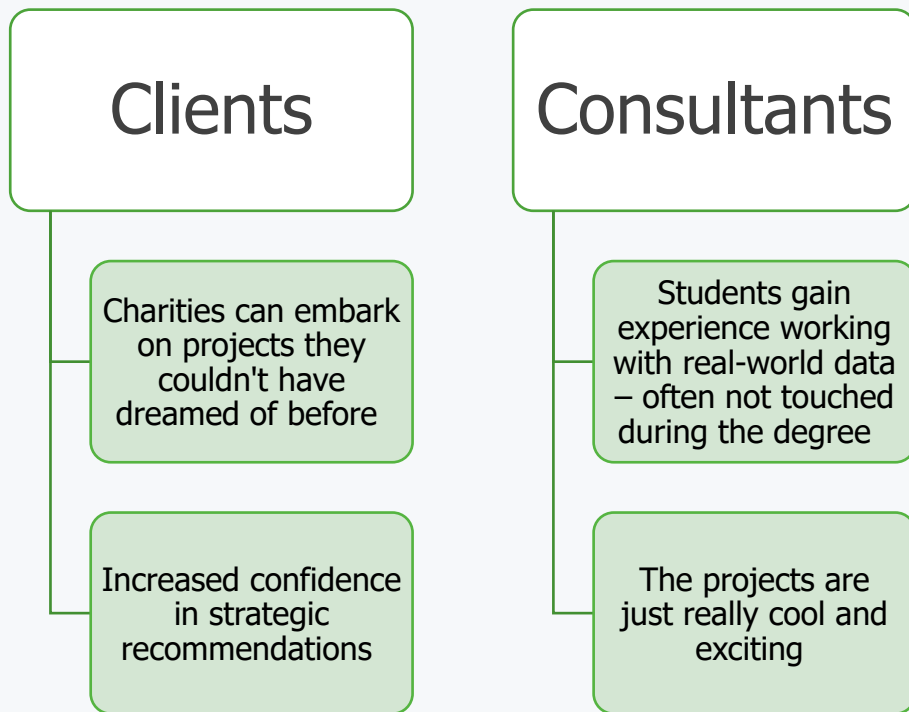
## STRATEGY & DATA OVERLAP

- ☐ Student Minds want to help university students cope with the challenges the period can bring.
- ☐ The strategy team **constructed a survey** which asked questions about the quality of different types of support a survey and distributed it to students across the U.K.
- ☐ The results were then analysed by the data team using statistical **tests for associations and correlations** whilst also determining if Bristol was an outlier in any category. The team's work resulted in increased confidence in the strategic recommendations

## EASY WIN

- ☐ Quartet are grant providing organisation in South West, funding initiatives that help the community
- ☐ Quartet wanted to **display the impact** of their Coronavirus relief fund
- ☐ We built a **PowerBI dashboard** which integrated their Salesforce data stream to clearly visualise their impact

## WHERE'S THE VALUE?





# INTERACTIVE WALKTHROUGH



---

# GIVE IT A GO



## Instructions:

1. [https://github.com/jireland88/Data\\_Science\\_in\\_Pro\\_Bono\\_Consulting](https://github.com/jireland88/Data_Science_in_Pro_Bono_Consulting)
2. -> Scroll to the bottom and press “Launch Binder”
3. -> Donation Analysis.ipynb

## Objective:

To understand data about donation volumes and types to come up with recommendations as to how the client could increase the volume of legacy donations.

Legacy donations are donations made as part of somebody's will.

This is similar to work that we have done for St. Peter's Hospice.

## Notes:

The data is fake and was made up by me, nothing we discover is a “real” insight about any charity. Although there is a lot of potentially confusing code in the session, you do not need to write any and it will all come together towards the end.

---

## HOW YOU CAN LEARN MORE

### Fundamental Skills:

- Relational Databases: SQL - <https://www.w3schools.com/sql/>
- Statistics: Frequentist Inference – Take a University course / MIT OpenCourseWare
- Machine Learning: Andrew Ng - <https://www.coursera.org/learn/machine-learning>
  - (requires some concepts from linear algebra and calculus)
- Python: Codecademy + practice
- Data Visualisation: Practice – show your work to people see what they say and update accordingly

Learning data science is like learning a musical instrument – only way is practice.

### Easy datasets:

- Wisconsin Breast Cancer [https://archive.ics.uci.edu/ml/datasets/Breast+Cancer+Wisconsin+\(Diagnostic\)](https://archive.ics.uci.edu/ml/datasets/Breast+Cancer+Wisconsin+(Diagnostic))
- Iris <https://archive.ics.uci.edu/ml/datasets/iris>
- Titanic <https://www.kaggle.com/c/titanic>
- Twitter (Tweepy)



Q&A – THANKS  
FOR LISTENING