Data Science Tools and Techniques

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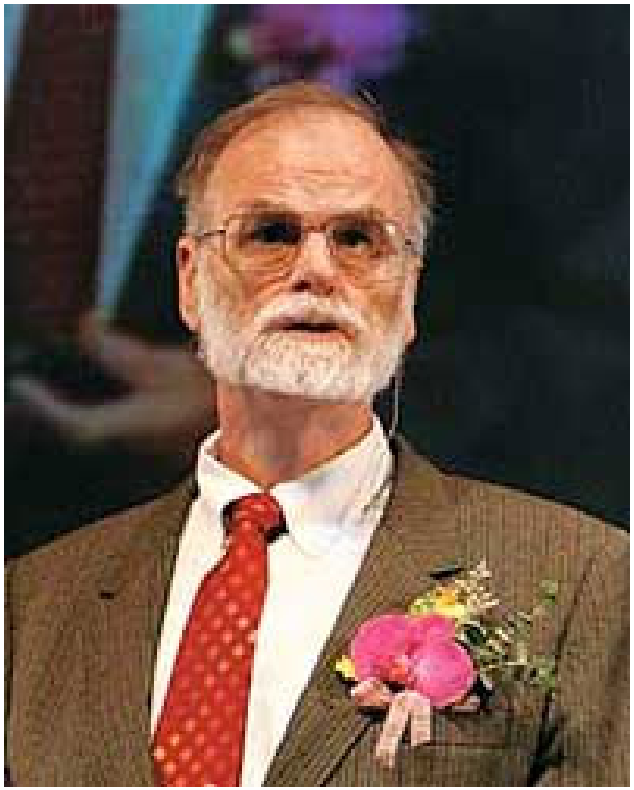
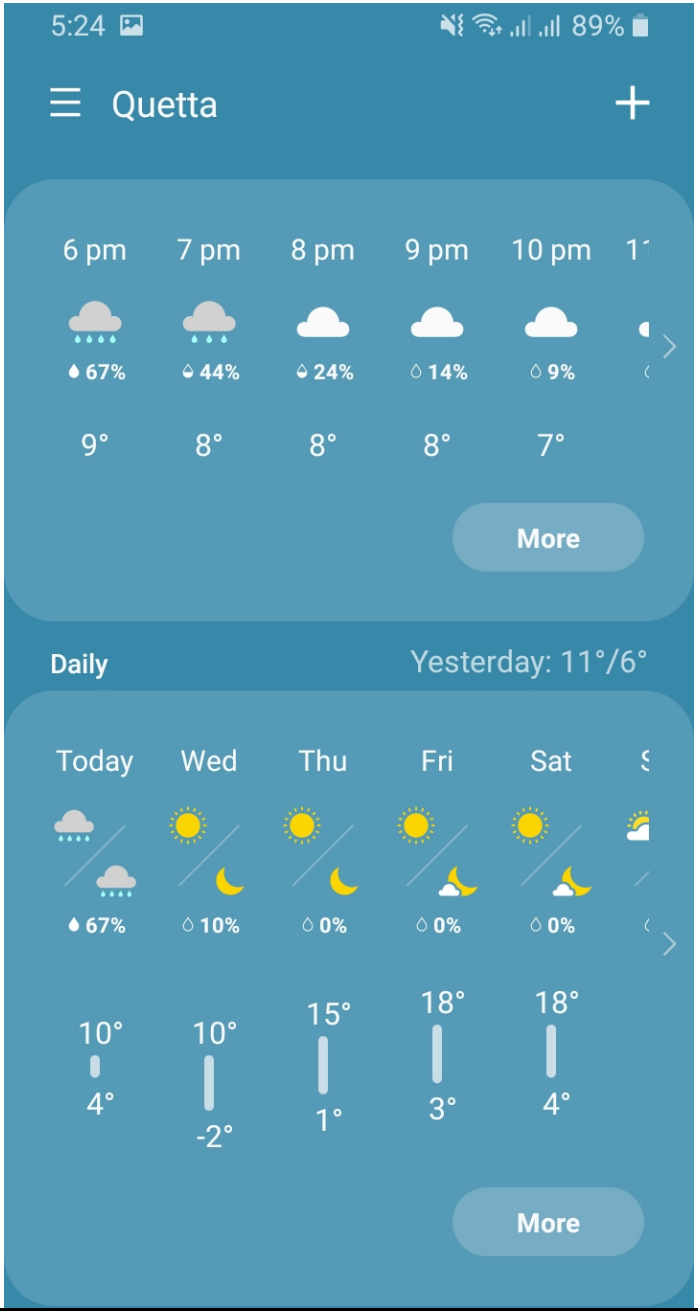
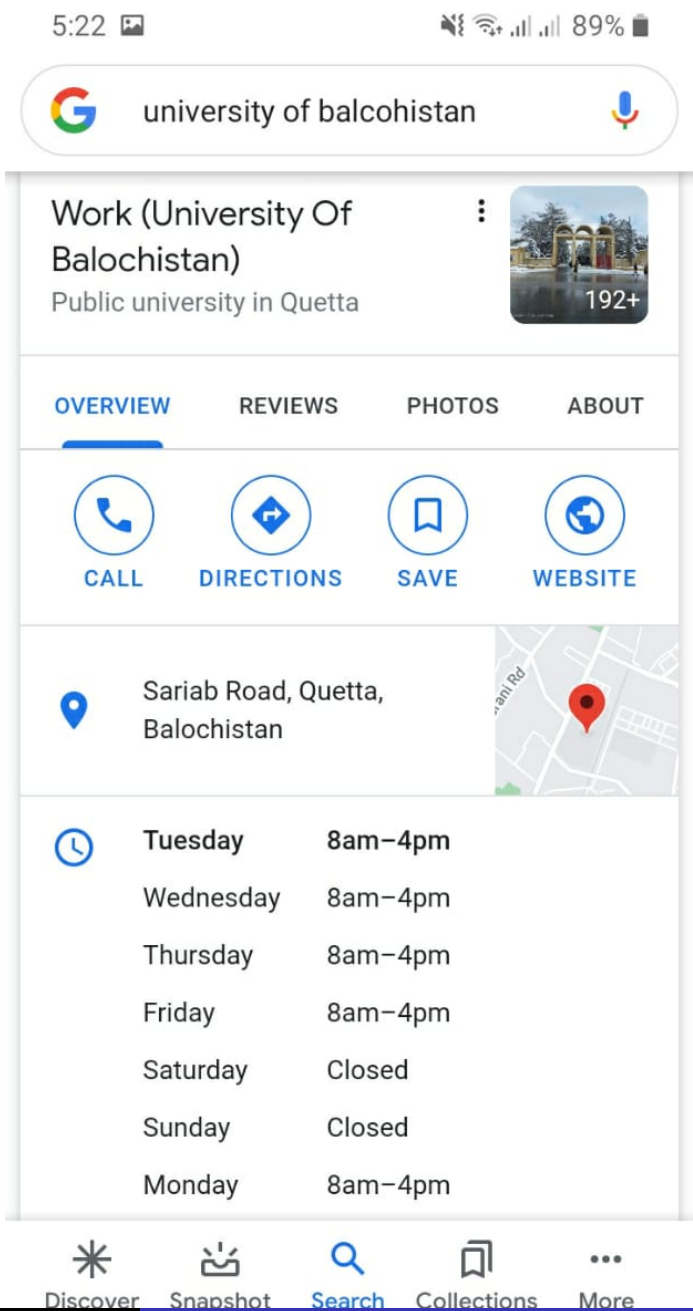
Who imagined Data Science(DS) first?



- Turing Award Winner James Nicholas Gray
- Imagined DS as 4rth paradigm of science

What is Data Science?





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- Computer Science changed lives several decades ago

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- Open source development is the norm

Data Science defined

A methodology by which actionable insights can be inferred from data.

Objective of data science

- production of beliefs informed by data to be used as the basis of decision making
- In absence of data, beliefs are uninformed and decisions are based on best practice or intuition.

Data Science and 4 strategies

- DS allow us to adopt 4 different strategies to explore the world using data.

1. Probing reality
2. Pattern discovery
3. Predicting future events
4. Understanding people and the world.

Probing Reality

- Data can be gathered by
  i) passive methods
  ii) active methods: response of the world to our actions
- Analysis of these responses can be extremely valuable.
  - e.g. what is the best button size and color? best answer found by probing the world.

Pattern discovery

- Datafied problems can be analyzed automatically to discover useful patterns.
  - e.g. user profiles an ingredient in programmatic advertising or digital marketing.

Predicting future events

- variety of statistical techniques that analyze current and historical facts to make predictions about future events.

Understanding people and the world

- large companies and governments are investing considerable amounts of money in research areas e.g.
  - understanding natural language
    - computer vision
    - psychology
    - neuroscience

Toolboxes for Data Scientists

- Python
- R
- Matlab / Octave

Fundamental Python Libraries for Data Scientists

1. Numeric and Scientific Computation: NumPy and SciPy
2. Machine Learning in Python: SCIKIT-Learn
3. Python Data Analysis: PANDAS

Data Science Ecosystem Installation

- All in one bundle Anaconda

Practical session

How to learn more

- plenty of resource available online for free
  - kaggle
  - datacamp
  - R swirl
- my github repo