



University of
Lancashire

An Introduction: Data Science

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Where opportunity creates success

Starter Activity

- What do you understand about the subject of 'Data Science'?
- What are your expectations of this module?
- What is 'Artificial Intelligence' and its relation to 'Data Science'?

Introduction

Module overview and outline:

- Understanding Data
- Programming with an appropriate computer language
- Data Science for Business

Learning Outcomes:

- Perform and evaluate basic descriptive, exploratory and confirmatory data analysis.
- Write programs in an appropriate language for analysing data.
- Visualize data in multiple ways.
- Summarize, organize and communicate knowledge from data analysis.

Schedule

Assessment

Module Team:

- Fath Ullah; Karen O'Shea, Iain Simpson

Responsibilities: Students

- **Timeliness**
 - Arrive in time to be prepared for the lecture/workshop
 - Manage your time for study effectively
- **Communication**
 - Talk to us for support, to raise issues and to seek advice/guidance
 - To monitor and use university communication mechanisms
- **Participation**
 - Attend all scheduled sessions and activities
 - To display professional conduct at all times
 - Contribute to group discussions and activities
- **Personal study**
 - Personal investigation of concepts and ideas
 - Prepare for assessments and exams
- **Behaviour**
 - To treat all with respect: treat others as you would expect to be treated
 - To recognise and address/report all inappropriate behaviours and attitudes

Responsibilities: Ours

- **Timeliness**
 - Arrive in time to be prepared for delivery before the start of the lecture/workshop
 - To ensure all scheduled sessions and activities run effectively and as planned
- **Communication**
 - To provide clear communication of any changes to scheduled events and activities
 - To clearly communicate issues and adjustments that may affect study and assessment
 - To respond, in a timely manner, to issues raised
- **Participation**
 - To support and challenge learning and the development of understanding
 - To model and display professional conduct at all times
 - To always challenge inappropriate professional behaviours and attitudes whenever they occur
- **Study**
 - To professional prepare and deliver high quality teaching and assessment
 - To fairly assess and report individual application of knowledge, skills and understanding
- **Behaviour**
 - To treat all with respect: treat others as you would expect to be treated
 - To recognise and address/report all inappropriate behaviours and attitudes

Learning Objectives

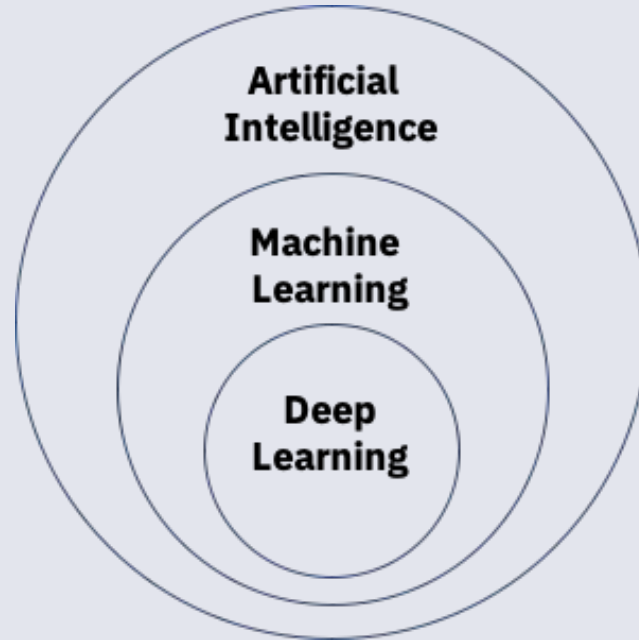


Define Data Science



Discuss examples of Data Science and its
relation to Artificial Intelligence

What is Artificial Intelligence (AI)?



The Turing Test Approach

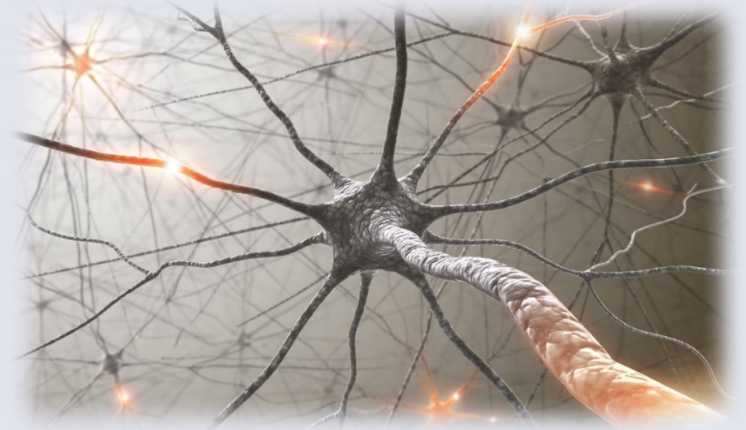
- Proposed by Alan Turing (1950), was earliest definition of an attempt to provide a definition of intelligence. AI Conversation...

Computers would require:

- **Natural language processing:** to enable it to communicate
- **Knowledge representation:** to store what it knows or hears
- **Automated reasoning:** to use the stored information to answer questions and to draw new conclusions
- **Machine learning:** to adapt to new circumstances and to detect patterns

Neuroscience

- Biological inspired AI
- Neurons and connections
- Brains cause minds (Searle, 1992)
- Psychology – cognitive psychology
- Linguistics



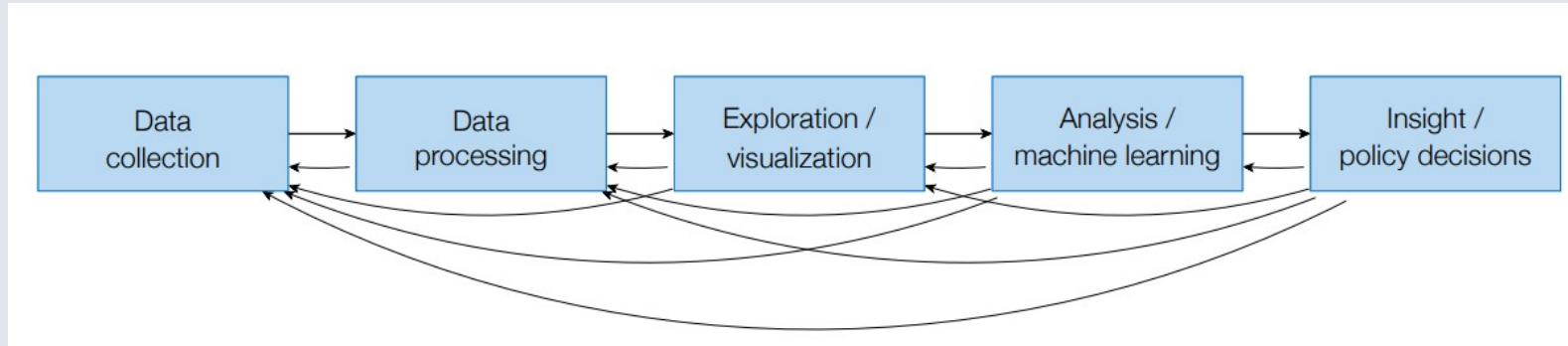
So what is data science?

Data science is the application of computational and statistical techniques to address or gain **insight** into some **problem** in the real world.

Data Science

- Data collection
- Statistics
- Data Processing
- AI (Machine Learning)
- Scientific Inquiry
- Visualization
- Business Analytics
- Communication and Presentation

Data Science Model



Learning Objectives

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- Discuss examples of Data Science and its relation to Artificial Intelligence