Introduction to Data Science for Data Professionals Training

Duration: **3 Day**

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Overview

This three day course is aimed at those who are familiar with the essentials when working with data and are interested in learning about how Data Science, Analytics, Machine Learning, and Artificial Intelligence (AI) can be used to yield value from data assets.

This course will be of interest if you are interested in developing your own skills to move from analytics to Data Science, or if you are supporting organisational digital change, or if you are working with Data Scientists and want to learn more about what's possible.

You will be introduced to key concepts and tools for use in Data Science, including typical Data Science Project lifecycles, potential applications & project pitfalls, relevant aspects of data governance and ethics, roles and responsibilities, Machine Learning and AI model development, exploratory analysis and visualisation and strategies for working with Big Data.

Throughout the course you will engage with activities and discussions with one of our Data Science technical specialists. Two of the course modules will allow you to complete 'low or no'-code practical labs in order to test and compare the capabilities of Python and R, and to see a Machine Learning or AI workflow using Orange – giving you enough to start some ideas flowing and try things in your workplace or continue learning on one of our technical training routes into Data Science, Machine Learning, and AI with a firm grounding in key Data Science concepts.

Prerequisites

We recommend that delegates are familiar with fundamental data concepts, such as those found on our QA Data Essentials programme. You should also have an interest in developing Data Science within your organisation or in becoming a Data Scientist. No prior coding experience is required.

Target Audience

Members of the audience are not required to have a high level of technical expertise, but should be familiar with fundamental concepts for Data, such as table structure.

They may be Mid/Senior Leadership seeking a greater understanding of how to implement Data Science within their organization.

They may come from other technical backgrounds such as Data Analysts, Software Developers, and Data Engineers who either work with Data Scientists or are using this course to begin a journey towards training as a Data Scientist.

In the latter case, audience members may ask for recommendations for their next steps in training towards becoming Data Scientists. We recommend the following refreshed courses:

Data Science Learning Pathways can be selected by choosing either Python or R and a Cloud Platform certification:

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- Sourcing and handling data:
  - QADHPYTHON Data Handling with Python
  - QADHR Data Handling with R
  - QAPDHAI Python Data Handling with AI APIs
- Statistics for Data Analysis:
  - QASDAPY Statistics for Data Analysis with Python
  - QASDAR Statistics for Data Analysis with R
- Programming and Software Development skills:
  - QAPYTH3 Python Programming
  - QARPROG R Programming
- Machine Learning Development:
  - QADSMLP Data Science and Machine Learning with Python
  - QADSMLR Data Science and Machine Learning with R
- Mathematics for Developing Algorithms for ML and AI models, Big Data Mining, and working with Neural Networks:
  - QAMFDS Mathematics for Data Science
- Forecasting:
  - QATSFP Time Series and Forecasting with Python
  - QATSFR Time Series and Forecasting with R

Suggested courses leading to Certification:

- MDP100 Designing and Implementing a Data Science Solution on Azure (DP-100)
- AMWSMLP Machine Learning Pipelines on AWS
- GCPMLGC Machine Learning on Google Cloud

What You Will Learn

- Compare commonly used Data Science tools with taster activities to try out R and Python
- Use a no-code drag and drop tool to create a simple Machine Learning model and develop ideas for Data Science projects
- Discuss the need for Data Governance in supporting Data Scientists creating Machine Learning and AI systems for extracting value from data
- Follow a typical Data Science project lifecycle for providing AI models
- Understand typical workflows for exploring and visualising data for analysis
- Identify practical ways in which AI and Machine Learning models can be reported in order to facilitate governance oversight
- Understand that legal and regulatory frameworks for AI are evolving and discuss some of the most recent developments
- Identify the storage and analytics challenges that Big Data might pose in Data Science projects
- Begin to develop a plan for personal and organisational learning towards Data Science

Outline

Introduction to Data Science and the Data Analytics Lifecycle:

- Describe what data science is and related roles and responsibilities within an organisation.
- Identify the stages of a Data Analytics project.
- Discuss what challenges need to be overcome or avoided in order to achieve a successful Data

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Science project outcome.

Introduction to Data Governance:

- Identify the Data Lifecycle and the role of key personnel
- Describe the definition and purpose of data governance.
- Identify scenarios where data governance is required in supporting Data Science
- Describe the levels of Organisational Data Maturity

Introduction to Machine Learning:

- Categorise a variety of Machine Learning algorithms and their purposes. Including Supervised, Unsupervised, Semi-Supervised, and Reinforcement Learning.
- Identify sources of errors in Machine Learning models and introduce Machine Learning Governance considerations
- Examine an example Machine Learning solution for a real problem.

R and Python Taster:

- Identify development environments for R and Python.
- Identify how to access data from R and Python and identify data preparation methods.
- Use R and Python to perform a calculation and create a plot using ready made functionality.
- Explore their capabilities for Data Visualisation, Machine Learning, and AI.

Exploratory Data Analysis:

- Interpret and understand the implications of examples of measures of central tendency, variation, and skew.
- Identify and investigate outliers.
- Identify examples of methods for finding connections and differences between variables and for dimension reduction.

Data Visualisations for Analysis:

- Identify and interpret appropriate visualisations for a single column of data or two columns of data.
- Identify and interpret appropriate visualisations for time series data
- Identify and interpret appropriate visualisations for geospatial data

Interpreting Data Science Dashboards:

- Describe the purpose and aim of data story telling.
- Identify appropriate Key Performance Indicators from a range of potential metrics.
- Critique example dashboard designs.

Legal and Ethical Considerations for Data Analysts:

- Discuss the importance of legal, ethical, and moral considerations in a Data Analytics project and identify applicable UK Legislation for which employees should receive training.
- Discuss ethical considerations for data handling.
- Recognise ethical considerations in examples of machine learning, deep learning, and AI.
- Note that this module presumes prior knowledge or intended further study of Data Protection and other compulsory Data-related training within your organisation.

Organisational Data Strategy:

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- Discuss the stages of organisational data maturity.
- Identify strategic frameworks for developing organisational data strategy.
- Critique an example strategic plan with suggestions for improvements.

Introduction to SQL and Big Data:

- Identify the need for SQL Databases
- Describe what Big Data is and the challenges it presents.
- Identify potential motivations for using Big Data through example case studies.
- Identify tools that are available for addressing challenges with Big Data.

Professional Standards for Data Scientists:

- Consider how this course could impact on your role or organisation.
- Consider and discuss further training you or others in your organisation would benefit from.
- Identify industry recognised qualifications to assist with professional development in your organisation.