SMART Skills Python: Course Handbook

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The demand for high-level numeracy skills and knowledge of statistical and computational methods is ever increasing. As organisations are having to adapt to a world that is becoming ever more data-driven, particularly in the age of 'big data', they look to recruit those with data skills. This is an issue that is even shared by the academic research community as fields that were traditionally non-quantitative, such as archaeology and the humanities, are becoming increasingly compelled by data. The pace at which this demand has developed has resulted in a noticeable skills gap within the UK, where individuals who wish to pursue any one of a large number of careers find themselves unable to do so due to a lack of data analysis experience being offered to them.

The SMART Skills programme aims to address this gap. It does so by offering the opportunity for individuals to develop a theoretical understanding of statistical methods, data analysis and data visualisation techniques through an intense – but thoroughly supportive – training course. This SMART Skills Python course is designed as an introduction to these employability skills using the Python programming language. Over five days, students will learn how to prepare, analyse and communicate data using Python via Jupyter Notebooks.

Why take this course?

Statistics is a scary word to many people. A statistic is simply a number, and here's the thing: you don't *have* to be a statistician to be confident working with data. Yet almost every role in every company requires an understanding of data, and many desired roles require data analysis experience.

This course provides the foundations for you to understand, execute and communicate data analysis in a widely recognised software platform that was built for quantitative data analysis. Over five days, you will gain valuable skills that you can market to employers, gain confidence in your ability to work with data, and create a knowledge base that you can build on for years to come.

Learning Outcomes

This course is aimed at individuals with some prior experience or knowledge of statistical methods and data analysis techniques. However, it is expected that you will not have used Python to implement these, or at the least, you won't have received formal statistics training in Python. Through a mix of formal teaching and practical exercises, at the end of this course you will:

- Have an understanding of a reproducible research workflow in Python via Jupyter Notebooks
- Be able to prepare raw data for analysis
- Be able to perform data analysis and statistical tests
- Be confident in communicating the results of your analysis
- Have a greater understanding of the research process

In addition, you will gain a number of transferable skills that will enhance your employability. During the course, you will develop the following key skills:

- Coding in Python
- Data cleaning
- Data analysis and visualisation
- Collaborative project work

The delivery of the course takes place over five sessions of two and a half hours each, and they will be a mix of lectures and guided practical exercises; the final session will be a group project where you produce a data-focused report.

Course Content

The software used throughout this course is Python, which is a very flexible and user-friendly open-source programming language that can handle various data analysis and statistical tasks. We will work in Python via Jupyter Notebooks provided by Google Colab, which is a free environment for interactive computing. To access Google Colab, you need to have a Google (Gmail and Drive) account.

Day	Topic
Session 1	Introduction to Python syntax and Jupyter Notebooks workflow
Session 2	Working with datasets: data cleaning and recoding, creating new variables
Session 3	Summarising and visualising data
Session 4	Statistical tests in Python
Session 5	Group report project

Contact

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