Statistics with Python Specialization

 coursera.org/specializations/statistics-with-python

Practical and Modern Statistical Thinking For All. Use Python for statistical visualization, inference, and modeling

WHAT YOU WILL LEARN

✓

Create and interpret data visualizations using the Python programming language and associated packages & libraries

✓

Apply and interpret inferential procedures when analyzing real data

✓

Apply statistical modeling techniques to data (ie. linear and logistic regression, linear models, multilevel models, Bayesian inference techniques)

✓

Understand importance of connecting research questions to data analysis methods.

SKILLS YOU WILL GAIN

Python ProgrammingData Visualization (DataViz)Statistical ModelStatistical inference methodsStatisticsData AnalysisConfidence IntervalStatistical InferenceStatistical Hypothesis TestingBayesian Statisticsstatistical regression

About this Specialization

This specialization is designed to teach learners beginning and intermediate concepts of statistical analysis using the Python programming language. Learners will learn where data come from, what types of data can be collected, study data design, data management, and how to effectively carry out data exploration and visualization. They will be able to utilize data for estimation and assessing theories, construct confidence intervals, interpret inferential results, and apply more advanced statistical modeling procedures. Finally, they will learn the importance of and be able to connect research questions to the statistical and data analysis methods taught to them.

Applied Learning Project

The courses in this specialization feature a variety of assignments that will test the learner's knowledge and ability to apply content through concept checks, written analyses, and Python programming assessments. These assignments are conducted through quizzes, submission of written assignments, and the Jupyter Notebook environment.

How the Specialization Works

Take Courses

A Coursera Specialization is a series of courses that helps you master a skill. To begin, enroll in the Specialization directly, or review its courses and choose the one you'd like to start with. When you subscribe to a course that is part of a Specialization, you're automatically subscribed to the full Specialization. It's okay to complete just one course — you can pause your learning or end your subscription at any time. Visit your learner dashboard to track your course enrollments and your progress.

Hands-on Project

Every Specialization includes a hands-on project. You'll need to successfully finish the project(s) to complete the Specialization and earn your certificate. If the Specialization includes a separate course for the hands-on project, you'll need to finish each of the other courses before you can start it.

Earn a Certificate

When you finish every course and complete the hands-on project, you'll earn a Certificate that you can share with prospective employers and your professional network.

There are 3 Courses in this Specialization

COURSE

1

Understanding and Visualizing Data with Python

At the end of each week, learners will apply the statistical concepts they've learned using Python within the course environment. During these lab-based sessions, learners will discover the different uses of Python as a tool, including the Numpy, Pandas, Statsmodels, Matplotlib, and Seaborn libraries. Tutorial videos are provided to walk learners through the creation of visualizations and data management, all within Python. This course utilizes the Jupyter Notebook environment within Coursera.

SHOW ALL ABOUT UNDERSTANDING AND VISUALIZING DATA WITH PYTHONSHOW ALL

COURSE

2

Inferential Statistical Analysis with Python

In this course, we will explore basic principles behind using data for estimation and for assessing theories. We will analyze both categorical data and quantitative data, starting with one population techniques and expanding to handle comparisons of two populations. We will learn how to construct confidence intervals. We will also use sample data to assess whether or not a theory about the value of a parameter is consistent with the data. A major focus will be on interpreting inferential results appropriately.

At the end of each week, learners will apply what they've learned using Python within the course environment. During these lab-based sessions, learners will work through tutorials focusing on specific case studies to help solidify the week's statistical concepts, which will include further deep dives into Python libraries including Statsmodels, Pandas, and Seaborn. This course utilizes the Jupyter Notebook environment within Coursera.

SHOW ALL ABOUT INFERENTIAL STATISTICAL ANALYSIS WITH PYTHONSHOW ALL

COURSE

3

Fitting Statistical Models to Data with Python

In this course, we will expand our exploration of statistical inference techniques by focusing on the science and art of fitting statistical models to data. We will build on the concepts presented in the Statistical Inference course (Course 2) to emphasize the importance of connecting research questions to our data analysis methods. We will also focus on various modeling objectives, including making inference about relationships between variables and generating predictions for future observations.

This course will introduce and explore various statistical modeling techniques, including linear regression, logistic regression, generalized linear models, hierarchical and mixed effects (or multilevel) models, and Bayesian inference techniques. All techniques will be illustrated using a variety of real data sets, and the course will emphasize different modeling approaches for different types of data sets, depending on the study design underlying the data (referring back to Course 1, Understanding and Visualizing Data with Python). During these lab-based sessions, learners will work through tutorials focusing on specific case studies to help solidify the week's statistical concepts, which will include further deep dives into Python libraries including Statsmodels, Pandas, and Seaborn. This course utilizes the Jupyter Notebook environment within Coursera.

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