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How to analyze excel data in python

Data Analysis with Excel is a comprehensive tutorial that provides a good insight into the latest and advanced features available in Microsoft Excel. It explains in detail how to perform various data analysis functions using the features available in MS-Excel. The tutorial has plenty of screenshots that explain how to use a particular feature, in a step-by-step manner. Audience This tutorial has been designed for all those readers who depend heavily on MS-Excel to prepare charts, tables, and professional reports that involve complex data. It will help all those readers who use MS-Excel regularly to analyze data. Prerequisites The readers of this tutorial are expected to have a good prior understanding of the basic features available in Microsoft Excel. Learn how to analyze data using Python. This course will take you from the basics of Python to exploring many different types of data. You will learn how to prepare data for analysis, perform simple statistical analysis, create meaningful data visualizations, predict future trends from data, and more!Topics covered: 1) Importing Datasets 2) Cleaning the Data 3) Data frame manipulation 4) Summarizing the Data 5) Building machine learning Regression models 6) Building data pipelines Data Analysis with Python will be delivered through lecture, lab, and assignments. It includes following parts: Data Analysis libraries: will learn to use Pandas, Numpy and Scipy libraries to work with a sample dataset. We will introduce you to pandas, an open-source library, and we will use it to load, manipulate, analyze, and visualize cool datasets. Then we will introduce you to another open-source library, scikit-learn, and we will use some of its machine learning algorithms to build smart models and make cool predictions. If you choose to take this course and earn the Coursera course certificate, you will also earn an IBM digital badge. LIMITED TIME OFFER: Subscription is only \$39 USD per month for access to graded materials and a certificate. Definition of Data Manipulation with Python Data manipulation with python is defined as a process in the python programming language that enables users in data organization in order to make reading or interpreting the insights from the data more structured and comprises of having better design. For example, arranging the employee’s names in alphabetical order will enable quicker searching of a particular employee by their name. The key feature of data manipulation is enabling faster business operations and also emphasize optimization in the process. Through proper manipulated data one can analyze trends, interpret insights from financial data, analyze consumer behaviour or pattern, etc. Not only the analyzing, but it also enables users to neglect any unnecessary data in the set so that one can save space and only fill the limited space with important and necessary data. In this article, we will look into the different methods of manipulation in python and also look into the examples Data manipulation methods with Python Python has been the most famous and most used language amongst developers in order to manipulate data in a dataset. With open-source implementations in Python, we have various methods that help in the implementation of the manipulation methods in Python. For all the following methods we would first need to install pandas in python and that can be achieved by running the following command in the command prompt: pip install pandas Once the pandas package is installed in the system, we would need to import the pandas library into our codebase by running: import pandas as pd The reason one would use pd is to make sure that we can use the short form wherever we would need to call the corresponding package. Now that we have installed and imported the pandas library, we would use one of its functions to read the CSV file and then store the return dataset into a variable. we would run the following code: variable_name = pd.read_csv(“file name.csv”) With this, we are all ready to explore the different methods of data manipulation with python and also look into the practical aspects of the same with live examples in the next section. 1. Filtering values on the basis of given condition In order to only work with specific data that meets the criteria as set by the guidelines, we would need to use the corresponding data manipulation to adhere to the conditions. In this data manipulation technique, we would use the .loc function which allows access of a group of rows and/or columns using Boolean array or labels. 2. Apply a certain function to create either a new variable or perform related operations In order to apply a particular function across rows or columns, we would use the .apply function as available in pandas. This function applies the corresponding declared function to the respective axis (0 for column and 1 for rows) and finally return the required variable as per the requirement. 3. Using a pivot function to aggregate across the desired column This method works similar to the pivot functionality in excel. Here we would pivot our data across the index and perform the required aggregation on other columns as per the requirement. The function we use here is .pivot. 4. Functionality of crosstab Using the function crosstab, one would be able to get an original view of the data, using this functionality one can validate some underlying hypothesis one would have by looking at the problem statement and initial part of the data. 5. Merge of 2 tables In normal real-life scenarios, it is nearly impossible to have all the data residing in one data table, and hence this functionality comes in very handy to merge 2 datasets on the basis of a key and can be declared as a parameter in the function “.merge”. 6. Sorting a table Using this data manipulation we can sort a table on the basis of keys that will be passed as parameters to the function “.sort values”. One can also pass a list of columns and on the basis of the chronological order, the table would get sorted. 7. Plotting of boxplots and histograms The final manipulation of this list, which is visually very interesting to explain the dataset is to plot boxplot and histogram in order to understand the different statistical parameters of the data and its inference. For example, using a boxplot we can easily visualize the number of outlier points in a dataset. Using histogram one can determine the distribution of the data and its spread! For our examples below, we would use 2 publicly available dataset i.e. the iris dataset and the titanic dataset! When the variable in the examples refers to data, we would be referring to the iris dataset! Examples Let us discuss examples of Data Manipulation with Python. Example #1 Getting rows on the basis of conditions on specific columns: Syntax: data.loc[(data[“SepalLengthCm”]>=5) & (data[“SepalWidthCm”]>1.2)], [“Id”, “SepalLengthCm”, “SepalWidthCm”, “PetalLengthCm”, “Species”]] Output: Example #2 Creation of new variable using the apply function: Syntax: def missingValues(x): return sum(x.isnull()) print(“Number of missing elements column wise:”) print(data.apply(missingValues, axis=0)) print(“Number of missing elements row wise:”) print(data.apply(missingValues, axis=1).head()) Output: Example #3 Finding the average of the Sepal Width per category of species using pivot table: Syntax: import numpy as np pivot_table = data.pivot_table(values=[“SepalWidthCm”], index=[“Species”], aggfunc=np.mean) print(pivot_table) Output: Example #4 Finding spread of data across 2 categorical columns: Syntax: import pandas as pd data titanic = pd.read_csv(“train.csv”) pd.crosstab(data_titanic[“Survived”],data_titanic[“Pclass”],margins=True) Output: Example #5 Merge 2 table on the basis of indexes of respective tables: Syntax: marks = pd.DataFrame([100, 98, 91], index=[‘Student 1’,‘Student 2’,‘Student 3’],columns=[‘Subject 1’]) marks marks_2 = pd.DataFrame([92, 93, 99], index=[‘Student 1’, ‘Student 2’, ‘Student 3’],columns=[‘Subject 2’]) marks_2 data_merged = marks.merge(right=marks_2, how=‘inner’, left_index=True, right_index=True, sort=False) data_merged Output: Example #6 Arrange a table in descending form, through multiple columns prioritizing one column first and then the other: Syntax: data_sorted = data.sort_values([‘SepalLengthCm’, ‘SepalWidthCm’], ascending=False) data_sorted[[‘SepalLengthCm’, ‘SepalWidthCm’]].head(10) Output: Example #7 Plot boxplot on the Iris dataset: Syntax: import matplotlib.pyplot as plt %matplotlib inline data.boxplot(column=“SepalLengthCm”,by=“Species”) Output: Example #8 Plot histogram on the Iris dataset: Syntax: import matplotlib.pyplot as plt %matplotlib inline data.hist(column=“SepalLengthCm”,by=“Species”,bins=30) Output: Conclusion With the help of this article, we have looked at the possible methods of manipulation along with respective examples of each. Though these are not an exhaustive list, we have tried to cover the maximum coverage of methods widely used in the industry. One can experiment with others and it is obviously a need to learn more! Recommended Articles This is a guide to Data Manipulation with Python. Here we discuss the definition, syntax, Data manipulation methods with python, and examples for better understanding. You may also have a look at the following articles to learn more - Knapsack Problem Python Traceback in Python CGI in Python OpenCV Python

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