DT094G Scripting and Systemadministration in Linux
Laboratory assignment — Pandas

Lennart Franked*

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Contents

Introduction

This laboratory session is divided into three parts

- Create a Python program to read, modify and write an excel spreadsheet document.

- Create a Python program that reads an excel spreadsheet document and create local user accounts.

- Create a Python program that removes local user accounts based on an excel spreadsheet.

It is strongly recommended that you run your programs in a virtual machine.

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*E-post: lennart.franked@miun.se.

1 Examination

This laboratory assignment is examined by submitting your solutions along with a lab report where you present your solutions.

Your code must be well structured and commented.

Make sure that each *Each function should do one thing, and one thing only.* Keep each function as short as possible.

Your code must follow PEP8 - Style Guide for Python Code [2] (exceptions are given on line length).

2 Aim

After completion of this laboratory assignment you will have shown that you

- can use third party libraries for Python,

- with the help of Pandas, import and export spreedsheet documents,

- are able to structure your Python code in functions,

- can write Python programmes that adheres to the PEP8 style guide lines,

- are able to divide a Python program into smaller modules, and

- can run linux system commands through Python.

3 Reading instructions

Before starting this laboration, you should have attended/watched the pandas lecture, and studied the example code that is available in the course platform. Familiarize yourself briefly with PEP 8 Style guide [2], useradd(8) [4], userdel(8) [5] and the Pandas API [1].

4 Tasks

Your solution must be structured accordingly:

- `dt094g_pandas_main_<studentid>.py` — This is the main program file, that will call the functions

- `spreadsheet.py` — This file should contain all your functions for working with the spreadsheet, i.e read and write.

- `account_manager.py` — This file should contain all your functions for creating and removing local user accounts.

4.1 Task 1 — Read, Modify and Write an excel spreadsheet document using Pandas.

In the course platform, you will find the spreadsheet-file `names.xls`. This file contains 33 names, along with personal number, phone number and office room number.

Write a program that will, with the help of pandas, read this spreadsheet document, and for each person add the following:

- Generate a unique 8 character username that is based on the persons first and last name.

- Generate a unique 12+ character long password/passphrase

- *HINT: See `getopt` to handle multiple arguments to your program*

The modified list of users, now with username and password included, should be written to a new file named `names_mod.xls`.

4.2 Task 2 — Create local user accounts

In this task you should increase functionality to your program, so that it can create local user accounts based on the spreadsheet document you created in task 1.
The new functionality of the program should be the following:

- Create local user accounts for each of the names found in the `names_mod.xls` file *(hint: see useradd(8) for adding local accounts, and subprocess.run [3] in Python for calling linux shell commands from Python.)*.

- The accounts should have the username and password that was generated from task 1.

- Information such as full name, phone- and room number is added as a comment when creating the accounts.

4.3 Task 3 — Delete local user accounts

Your final task is to add functionality to your program so that you can also remove local user accounts, based on the spreadsheet document that you used in task 2.
The new functionality of your program should be the following:

- Be able to remove local user accounts based on usernames listed in an excel spreadsheet document.

5 Submissions

Before submitting, make sure that your solutions follow the criteria given in Section 1. To pass this laboratory assignment, you must submit a laboratory report and an archive file containing your commented python code. As always, your report must be submitted in *PDF-format*.

References

[1] *Pandas API reference.* 2023. URL: https://pandas.pydata.org/docs/reference/index.html.

[2] *PEP 8 Style Guide for Python Code.* 2023. URL: https://peps.python.org/pep-0008/.

[3] *The Python Tutorial.* 2016. URL: https://docs.python.org/3/tutorial/index.html.

[4] *useradd(8) - Linux man page.* Nov. 2022. URL: https://linux.die.net/man/8/useradd.

[5] *userdel(8) - Linux man page.* Nov. 2022. URL: https://linux.die.net/man/8/userdel.