Teaching description ITU 2017-04-19

ITU, room 3A52, 16.00 – 20.00

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| Date: 19/4-2017  Subject: Programming – plotting in python  Target group: Primarily female students with basic or no coding experience  Theme: Graph your data – and be social about it.  **Purpose:**   * Let participants meet and discuss programming * Strengthen social bonding and networking * Introduce to online portal for easy programming * Brief introduction to python * Simple exercises to execute a python program * Use simple tools to make a graph * Use plotting facility to make a graph of a dataset * Strengthen interest in programming   **Content:**  The plan covers 3.5 hours. A main task is to strengthen the social bonds and network. Therefore, a considerable amount of time should be devoted to social exercises. The teaching will be a mix of short presentations to a subject or exercise, followed by a social interaction, thereafter an exercise with a followup.  The un-measurable outcome of social bonding and network will be examined in a final questionnaire evaluation.  The measurable outcome is expected to be:   * The participants should have met with at least 6 other participants in a discussion forum * The participant will have participated in an in-class “online poll”. * In a group have discussed a programming challenge, and presented the idea. * Made an account at <https://cloud.sagemath.com> for an online portal for easy programming * Tried to have made hello\_world.py program, and execute it through the terminal * Made a python Jupyter notebook * Discussed and in groups have solved how to plot a distribution of a range of numbers * Been introduced to <http://kaggle.com> , which contains training datasets * Loaded a dataset from NASA, and made a plot of the data   **Materials:**   * Mentors. Who? * Participants bring personal computer * access to internet -> Please confirm working access * Teacher access to projector (MacBook Air) -> Which adapter is needed? * google slideshow with presentation and exercises 🡪 http://tinyurl.com/codher1704 * account creation at sagemath * Download a dataset from https://github.com/Codher/graphing-data   **Methods:**  Establishment of social interaction in groups to facilitate networking. Simple presentation to a subject. Simple exercise. **Aid participants with IT-vocabulary.**  **Evaluation:**  The un-measurable outcome of social bonding and network will be examined in a final questionnaire evaluation. |

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| **Sequence** | **Material** | **Working method** | **Method** | **Purpose** |
| 16.00 – 16.20  20 min  Registration and welcome | Plamena ? |  |  |  |
| 16.20 – 16.25  5 min  Introduction and program | Slideshow |  |  | Welcome participants.  Give access to slideshow  Present program |
| 16.25 – 16.40  15 min  Mix+poll | b.socrative.com | Mix-subject-talk  Voting poll | Group work | Create initial network.  Who are the participants?  Internal discussion, anonymous poll |
| 16.40 – 16.50  10 min  Introduction to python | Slideshow |  |  | Set the stage for Python.  Examples from teachers use of python. |
| 16.50 – 17.00  10 min  Make account | All make an account at  cloud.sagemath.com |  |  | Prepare for exercises |
| **17.00 – 17.05**  **5 min**  **Tea break** |  |  |  |  |
| 17.05 – 17.15  10 min  Inside python | Cloud.sagemath.com | Exercise | Individual | Learn to start python |
| 17.15 – 17.25  10 min  Execute python program | Cloud.sagemath.com | Exercise | Individual | Execute a python program from file |
| 17.25 – 17.35  10 min  Use notebook | Cloud.sagemath.com | Exercise | Individual | Create a notebook, and try it |
| 17.35 – 17.45  10 min  Data discussion | Discuss at table 2 persons. Then mix to another table. | Talk and discuss | Group work | Let participants discuss 2 together, about some data they would like to make a graph about. Or their last graph they made |
| 17.45 – 17.55  10 min  Project collaboration | Cloud.sagemath.com | Introduction to social programming |  | Prepare to let participants work together 2 persons in a project |
| **17.55 – 18.05**  **10 min**  **Tea break** |  |  |  |  |

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| **Sequence** | **Material** | **Working method** | **Method** | **Purpose** |
| 18.05 – 18.15  10 min  Discuss problem solving | List of 25 numbers of grades in chemistry. | Discuss in group | Collaboration | What is the programming challenge in making a graph of distribution of numbers? |
| 18.15 – 18.25  10 min  Show possible solutions | Slideshow | Instruction |  | Show the participants there are numerous ways to solve the same problem. |
| 18.25 – 18.35  10 min  Try implementation | Slideshow | Group work |  | Let the participants try their own implementation |
| 18.35 – 18.45  10 min  Online poll | b.socrative.com |  |  | Fix any questions until now |
| 18.45 – 19.00  15 min  Help and errors in python | Slideshow | Instruction |  | Show how errors in python is presented. Show the help() function |
| **19.00 – 19.05**  **5 min**  **Tea break** |  |  |  |  |
| 19.05 – 19.15  10 min  Intro to kaggle.com | Slideshow |  |  | Introduce the kaggle.com platform, as a social place to try handling real-life datasets |
| 19.15 – 19.20  5 min  Users upload data | Slideshow |  |  | Users download dataset from github, and upload to sagemath project |
| 19.20 – 19.30  10 min  How to inspect data in python | Slideshow |  |  | Show functions to load dataset, inspect columns, and plot it |
| 19.30 – 19.50  20 min  Users plot |  |  |  | Let the user plot the data |
| 19.50 – 20.00  10 min  Socialize | First mix  Facebook |  |  | “Try to convince” the participants to take a screenshot of their graph, and post it on facebook, Instagram or whatever. ☺  #codher #graph #programming |

Final do an evaluation in b.socrative.com

# Extra material

* Convert a list of data to pandas, and make a graph of it?
* Load an excel sheet to pandas, and make a graph of it?