PYTHON4ALL

C.F.J. Pols, G.A. Steele

Delft University of Technology, Applied Sciences, Imaging Physics

OVERVIEW OF THE ROUNDTABLE

A basic knowledge of programming and data-analysis is indispensable for any engineer. Programming is therefore frequently included in a first year course in educational engineering programs. But what basic knowledge is required and how do we teach it? Moreover, how do we deal with the large differences in pre-existing knowledge, where some students already have a firm basis in programming? Should students use ChatGPT and if so, how and to what extent? How do we ensure that students keep up pace and how do we assess students' understanding?

In this roundtable we will focus on these questions. Participants are given room to share their experiences, views, approaches, and materials. We will share our approach and teaching materials with regard to teaching programming and data-analysis in Python in the first year physics lab course at Delft University of Technology (DUT). We will briefly elaborate on the innovative plans to design a gamified approach to Python and data-analysis, where students more or less follow their own path. Together we explore whether a special interest group can be formed who collaboratively share and develop materials related to the topic.

KEYWORDS

Python, data-analysis, Standards: 4, 8,

ACTIVITIES

Participants are asked to share / show their teaching materials related to the topic, and elaborate on the following questions (slides can be send to the first author):

- What basic knowledge of Python do you teach and how do you teach it?
- How do you deal with the large differences in pre-existing knowledge?
- How do you ensure everyone keeps up a proper pace?
- How do you assess students' knowledge?
- Is there a policy on using ChatGPT? What are your thoughts on using it (or not)?

It would benefit all participants if the materials are available so the participants can engage with the materials first hand.

TARGET AUDIENCE

This roundtable is relevant for teachers and program directors. Involvement or participation in a programming course is desirable but not mandatory. Participants are asked to bring their own device.

FOLLOW-UPS

The purpose of the roundtable is to share experiences, teaching strategies and developed materials. Ultimately, a special interest group is formed who, collaboratively, further share and develop materials.

BIOGRAPHICAL INFORMATION

Freek Pols is coordinator of the first year physics lab course at the Department of Applied Science at Delft University of Technology. His research focusses on teaching scientific inquiry at secondary school and first year university level. He recently became one of the educational fellows at DUT.

Gary Steele is a full-professor at the Department of Quantum Nanoscience at Delft University of Technology. He is the leader of a research group that explores the interaction of superconducting quantum circuits and mechanical resonators. In his teaching, he has recently been exploring online methods for student engagement and learning, including the use of interactive learning materials with Jupyter notebooks.

Corresponding author

Freek Pols
Delft University of Technology
Dept. of Applied Sciences
Lorentzweg 1, 2624CJ Delft
The Netherlands
c.f.j.pols@tudelft.nl