

# Formal Methods in Software Engineering

## Laboratory 10-12

This homework is for the laboratories 10-12. Deadline: 14.01.2024.

Since the topics of the next three courses includes the foundations needed for program/code static analysis, the main goal of this homework is to make experiments with a performant code static analysis tool for your favoured programming language. Lists with such tools can be found at the following addresses:

<https://github.com/analysis-tools-dev/static-analysis>

[https://en.wikipedia.org/wiki/Static\\_program\\_analysis](https://en.wikipedia.org/wiki/Static_program_analysis)

1. If you have NO experience in using a static analyzer:
  - (a) Investigate what analysis tools are suitable
  - (b) Choose and install an appropriate tool for (one of) your favoured language. If you choose a trial version, then be careful how long time you can used.
  - (c) Read the documentation and experiment several case studies, described in the documentation.
  - (d) Use the tool to analyze one of your recent projects. Write the experience in the Google Drive document (named "lab 10-12"):
    - i. Describe the methodology followed to analyze the project.
    - ii. Describe the issues reported by the tool and how these issues were fixed. Try to exploit all the functionalities of the tool.
    - iii. Write the conclusions of this experience.
2. If you have experience in using a static analyzer:
  - (a) Use the tool to analyze one of your recent projects that was not analyzed before. Write the experience in the Google Drive document (named "lab 10-12"):
    - i. Describe the methodology followed to analyze the project.
    - ii. Describe the issues reported by the tool and how these issues were fixed. Try to exploit all the functionalities of the tool.
    - iii. Write the conclusions of this experience.
  - (b) Do some experiments with Github Copilot and try to figure out how the tool can be used to validate the code suggested by the copilot. Describe the experience and the conclusion in the Google document.