



J. Hoenicke
T. Schindler

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Tutorials for Decision Procedures Exercise sheet 13

Exercise 1: Program Correctness for InsertionSort

Look at the example program `InsertionSort` from the π VC-website
<https://cs.stanford.edu/people/jasonaue/pivc/samples/>.

Perform the following tasks:

- (a) Give all basic paths of `InsertionSort`.
- (b) Compute the verification condition for the last basic path (ending with the post-condition).

Exercise 2: The π VC compiler (`pivc`)

Install and run the program π VC. You do not need an external solver as the new versions of π VC use a webservice for these tasks. Thus you have to be online to use it. You can find π VC and some samples on <https://cs.stanford.edu/people/jasonaue/pivc/>. Use π VC to prove partial correctness of the example program `InsertionSort` by proceeding as follows:

- (a) Replace the post condition with `true`. Hit “Compile”. All verification conditions should now be valid (green).
- (b) Check the flag “Generate Runtime Assertions” in the “Settings” menu and add the loop invariants that are needed to prove them.
- (c) Now set the post-condition back to

```
sorted(rv, 0, |rv| - 1)
```

and adjust the loop invariants to prove partial correctness.

Note that the “Submit” button does not work.