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Tutorial for Program Verification
Exercise Sheet 9

In this exercise sheet we use the Hoare proof system and its `while`-rule to prove correctness of a Boostan program with a loop.

Submit your solution by uploading it as PDF in ILIAS.

Exercise 1: Hoare Logic Proof   3 Points

Consider the following Boostan program $P = (V, \mu, \mathcal{T})$ with $V = \{i, j, x, y\}$, $\mu(i) = \mu(j) = \mu(x) = \mu(y) = \mathbb{Z}$, and $\mathcal{T}$ a derivation tree for the program code shown below.

```
x  := i;
y  := j;
while (x != 0) {
    x := x - 1;
    y := y - 1;
}
```

Give a Hoare logic proof showing that $\{\textbf{true}\}\,\mathcal{T}\,\{i = j \rightarrow y = 0\}$ is a valid Hoare triple.