



## IN [5/9]440: static analysis

Autumn 2018

### Handout 4

21. 11. 2018

#### Handout 4: SOS-while

Issued: 21. 11. 2018

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$$\begin{array}{c} \langle [x := a]^l, \sigma \rangle \rightarrow \sigma[x \mapsto [a]_\sigma^A] \quad \text{ASS} \qquad \langle [\text{skip}]^l, \sigma \rangle \rightarrow \sigma \quad \text{SKIP} \\ \\ \frac{\langle S_1, \sigma \rangle \rightarrow \langle \acute{S}_1, \acute{\sigma} \rangle}{\langle S_1; S_2, \sigma \rangle \rightarrow \langle \acute{S}_1; S_2, \acute{\sigma} \rangle} \text{SEQ}_1 \qquad \frac{\langle S_1, \sigma \rangle \rightarrow \acute{\sigma}}{\langle S_1; S_2, \sigma \rangle \rightarrow \langle S_2, \acute{\sigma} \rangle} \text{SEQ}_2 \\ \\ \frac{[b]_\sigma^B = \top}{\langle \text{if } [b]^l \text{ then } S_1 \text{ else } S_2, \sigma \rangle \rightarrow \langle S_1, \sigma \rangle} \text{IF}_1 \\ \\ \frac{[b]_\sigma^B = \top}{\langle \text{while } [b]^l \text{ do } S, \sigma \rangle \rightarrow \langle S; \text{while } [b]^l \text{ do } S, \sigma \rangle} \text{WHILE}_1 \\ \\ \frac{[b]_\sigma^B = \perp}{\langle \text{while } [b]^l \text{ do } S, \sigma \rangle \rightarrow \sigma} \text{WHILE}_2 \end{array}$$

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Table 1: While: operational semantics

## References

- [1] Flemming Nielson, Hanne-Riis Nielson, and Chris L. Hankin. *Principles of Program Analysis*. Springer Verlag, 1999.