

Eine imperative Sprache mit Ausnahmen

$c ::= \dots \mid \text{throw } a \mid \text{try } c_0 \text{ catch } X. c_1$

Semantik: $\llbracket c \rrbracket \sigma \in (\Sigma \cup \{\perp\}) + (E \times \Sigma)$

$$\llbracket \text{throw } a \rrbracket \sigma = \text{inr}(\llbracket a \rrbracket \sigma, \sigma)$$

$$\begin{aligned} \llbracket c_0; c_1 \rrbracket \sigma &= \text{case } \llbracket c_0 \rrbracket \sigma \text{ of } \text{inl } \sigma' \rightarrow \llbracket c_1 \rrbracket \sigma' \\ &\quad \mid \text{inr } (e, \sigma') \rightarrow \text{inr } (e, \sigma') \end{aligned}$$

$$\begin{aligned} \llbracket \text{try } c_0 \text{ catch } X. c_1 \rrbracket \sigma &= \text{case } \llbracket c_0 \rrbracket \text{ of } \text{inl } \sigma' \rightarrow \text{inl } \sigma' \\ &\quad \mid \text{inr } (e, \sigma') \rightarrow \llbracket c_1 \rrbracket \sigma' [X := e] \end{aligned}$$

Abnormale Korrektheit

$$\sigma \models^I \{A\}c\{B \parallel X.S\} \iff$$

$$(\sigma \models^I A \Rightarrow \text{case } \llbracket c \rrbracket \sigma \text{ of } \text{inl } \sigma' \rightarrow (\sigma' \models^I B)$$

$$| \text{inr } (e, \sigma') \rightarrow (\sigma'[X := e] \models^I S))$$

Regeln z.B.

$$\text{(seq)} \quad \frac{\{A\} c_0 \{C \parallel X.S\} \quad \{C\} c_1 \{B \parallel X.S\}}{\{A\} c_0; c_1 \{B \parallel X.S\}}$$

$$\text{(throw)} \quad \{A\} \text{throw } a \{\perp \parallel X.X = a \wedge A\} (X \notin FV(A))$$