

Translation Sketch

1 Expressions

E translates a Chalice expression into an equivalent SIL expression. Given an scoped identifier i , $\rho(i)$ denotes a globally unique identifier. E.g., $\rho(\text{someField}) = \text{SomeClass}::\text{someField}$

$$E \llbracket e_1 ? e_2 : e_3 \rrbracket_{\text{Ch}} = \llbracket E(e_1) ? E(e_2) : E(e_3) \rrbracket_{\text{SIL}} \quad (1)$$

$$E \llbracket e_1 == e_2 \rrbracket_{\text{Ch}} = \llbracket == (E(e_1), E(e_2)) \rrbracket_{\text{SIL}} \quad (2)$$

$$E \llbracket e_1 != e_2 \rrbracket_{\text{Ch}} = \llbracket != (E(e_1), E(e_2)) \rrbracket_{\text{SIL}} \quad (3)$$

$$E \llbracket e_1 < e_2 \rrbracket_{\text{Ch}} = \llbracket < (E(e_1), E(e_2)) \rrbracket_{\text{SIL}} \quad (4)$$

$$E \llbracket e_1 <= e_2 \rrbracket_{\text{Ch}} = \llbracket <= (E(e_1), E(e_2)) \rrbracket_{\text{SIL}} \quad (5)$$

$$E \llbracket e_1 >= e_2 \rrbracket_{\text{Ch}} = \llbracket >= (E(e_1), E(e_2)) \rrbracket_{\text{SIL}} \quad (6)$$

$$E \llbracket e_1 > e_2 \rrbracket_{\text{Ch}} = \llbracket > (E(e_1), E(e_2)) \rrbracket_{\text{SIL}} \quad (7)$$

$$E \llbracket e_1 \ll e_2 \rrbracket_{\text{Ch}} = /* \text{lock below} \text{ ???} */ \quad (8)$$

$$E \llbracket e_1 \text{ in } e_2 \rrbracket_{\text{Ch}} = \llbracket \text{in} (E(e_1), E(e_2)) \rrbracket_{\text{SIL}} \quad (9)$$

$$E \llbracket e_1 ! \text{in } e_2 \rrbracket_{\text{Ch}} = E \llbracket ! (e_1 \text{ in } e_2) \rrbracket_{\text{Ch}} \quad (10)$$

$$E \llbracket e_1 + e_2 \rrbracket_{\text{Ch}} = \llbracket + (E(e_1), E(e_2)) \rrbracket_{\text{SIL}} \quad (11)$$

$$E \llbracket e_1 - e_2 \rrbracket_{\text{Ch}} = \llbracket - (E(e_1), E(e_2)) \rrbracket_{\text{SIL}} \quad (12)$$

$$E \llbracket e_1 * e_2 \rrbracket_{\text{Ch}} = \llbracket * (E(e_1), E(e_2)) \rrbracket_{\text{SIL}} \quad (13)$$

$$E \llbracket e_1 / e_2 \rrbracket_{\text{Ch}} = \llbracket / (E(e_1), E(e_2)) \rrbracket_{\text{SIL}} \quad (14)$$

$$E \llbracket e_1 \% e_2 \rrbracket_{\text{Ch}} = \llbracket \% (E(e_1), E(e_2)) \rrbracket_{\text{SIL}} \quad (15)$$

$$E \llbracket ! e \rrbracket_{\text{Ch}} = \llbracket ! (E(e)) \rrbracket_{\text{SIL}} \quad (16)$$

$$E \llbracket - e \rrbracket_{\text{Ch}} = \llbracket - (E(e)) \rrbracket_{\text{SIL}} \quad (17)$$

$$E \llbracket e_1 [e_2] \rrbracket_{\text{Ch}} = \llbracket \text{at} (E(e_1), E(e_2)) \rrbracket_{\text{SIL}} \quad (18)$$

$$E \llbracket e_1 [e_2 \dots] \rrbracket_{\text{Ch}} = \llbracket \text{drop} (E(e_1), E(e_2)) \rrbracket_{\text{SIL}} \quad (19)$$

$$E \llbracket e_1 [\dots e_2] \rrbracket_{\text{Ch}} = \llbracket \text{take} (E(e_1), E(e_2)) \rrbracket_{\text{SIL}} \quad (20)$$

$$E \llbracket e_1 . id \rrbracket_{\text{Ch}} = \llbracket E(e_1) . id \rrbracket_{\text{SIL}} \quad (21)$$

$$E \llbracket e_1 . id (e \dots) \rrbracket_{\text{Ch}} = \llbracket \rho(id)(E(e_1), E(e \dots)) \rrbracket_{\text{SIL}} \quad (22)$$

$$E \llbracket \text{true} \rrbracket_{\text{Ch}} = \llbracket \text{true} \rrbracket_{\text{SIL}} \quad (23)$$

$$E \llbracket \text{false} \rrbracket_{\text{Ch}} = \llbracket \text{false} \rrbracket_{\text{SIL}} \quad (24)$$

$$E \llbracket \text{null} \rrbracket_{\text{Ch}} = \llbracket \text{null} \rrbracket_{\text{SIL}} \quad (25)$$

$$E \llbracket \text{this} \rrbracket_{\text{Ch}} = /* ??? */ \quad (26)$$

$$E \llbracket x \rrbracket_{\text{Ch}} = \llbracket x \rrbracket_{\text{SIL}} \quad \text{where } x \text{ is a numeric literal} \quad (27)$$