Homework 7: Denotational Semantics

Due:

This is an individual homework.

This homework discusses Luca Cardelli's paper, "A Semantics of Multiple Inheritance" (*Information and Computation*, volume 76, pages 138-164, 1988).

1. (5 points) In Cardelli's semantics, how many elements are there in the following type?

   $$\{\text{a: bool, b: bool}\}$$

   (Give the answer, and also the place in the paper, including the page number(s), where you found the answer.)

2. (5 points) What features of Cardelli's language models inheritance as in Smalltalk? (Give the answer, and also the place in the paper, including the page number(s), where you found the answer.)

3. (5 points) From the grammar on p. 152, how is the language different from SML?

4. (10 points) From the semantics on page 154, describe in English all the run-time situations that cause type errors.

5. (5 points) In the type inference rules (section 12), there is nothing that corresponds directly to [Rule 3] and [Rule 5] (from p. 142). Is this a mistake? If not, how does the subtyping in the type inference rules suffice?