Structure of Programming Languages I: Denotational Semantics

Assignments

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Please return the completed results by February 1. Put them in an envelope, address it to me, and put it into some university mail box. If there are problems, feel free to contact me per email. Do not forget to denote your name, Matrikelnummer and Studienkennzahl (SKZ).

1. Define the input language of a spreadsheet processor: the user may open a spreadsheet of a certain size, navigate between cells and enter data into these cells, i.e., numbers, references to other cells (by their coordinates), and arithmetic expressions. Whenever a new entry is defined, the values in the spreadsheet are recalculated (if another cell is referenced, of course first this cell has to be recalculated). Define the semantic domains, abstract syntax, and valuation functions of the language. What happens if cyclic definitions of cell values are encountered?

2. Prove for the language presented in "A Block-Structured Language" that, if any command in a prograam maps a store to an erroneous post-store, then the denotatioon of the entire program is exactly that erroneous post-store.