Interactive Theorem Proving - A. Chlipala (Notes)

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1 LECTURE 1

This is a fair introduction to what is the basic idea of interactive theorem proving. We are given some pre conditions , post conditions and the core idea/theorem to check. Examples include :

- Solving a simple linear equation for x, eg: $y = m * x + b$. The pre conditions are that $m \neq 0$. Post conditions involve the value of x obtained actually satisfies the original equation.

- Alias analysis involves determination of optimum strategy to find the number of ways a particular memory address can be accessed. using ITP techniques we can assertain this by checking and case elimination of redundant pointers.

- Anderson's Analysis Often called Anderson-Style Pointer analysis involves the flow sensitive pointer analysis and pointer mutation. It follows assigning a set-notation to pointers bounded by given constraints. It treats all allocations done by one instruction as if they are being done to only 1 object. We define $PT(x)$ as a set that approximats all the locations that can be ppointed by the variable x. Different constraints are generated according to the type of modifications done. We then case-by-case analize them. for better examples : https://www.seas.harvard.edu/courses/cs252/2011sp/slides/Lec06-PointerAnalysis.pdf.