

# Constructing Provably Correct Logic Programs

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## Abstract

*This paper demonstrates a process of constructing logic programs whereby logic programs can be proved correct with respect to specifications. Building on previous work on stepwise enhancement and program maps, we introduce program enhancement structures which capture the application of standard programming techniques to well understood programs. We give an overview of our views on correctness, followed by a detailed proof of correctness which uses the program enhancement structure.*

## 1 Motivation

The software crisis for procedural languages was precipitated by the failure of the prevailing ad-hoc attitude towards programming to scale to larger programming projects. One response to the software crisis was structured programming. The programmer would be trained to use well-defined programming constructs, and encouraged to take a disciplined approach. Ideally, a ‘science of programming’ would be developed where correctness theorems could be proved about programs.

This paper concerns an approach to systematize logic programming which can be viewed as an analog to structured programming in procedural languages. The programmer is given a collection of operations to construct complicated programs. Behavior of the complicated program can be inferred from the structure of the program and the behavior of the simpler pieces. Proofs of correctness can be leveraged from the construction. In our classroom experience, we are convinced that our approach significantly shortens the time it takes students to become competent Prolog programmers.

The emphasis of this paper is not, however, on our approach to logic programming. Rather we are concerned with demonstrating a process of programming where programs can be proved correct with respect to specifications. This paper builds on our previously published theory of program maps [3].

This paper is organized as follows. Section 2 presents program maps for logic programs.

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# Constructing Logic Programs

**B Lingard**



## **Constructing Logic Programs:**

## Unveiling the Energy of Verbal Beauty: An Emotional Sojourn through **Constructing Logic Programs**

In some sort of inundated with displays and the cacophony of immediate interaction, the profound power and emotional resonance of verbal artistry frequently diminish in to obscurity, eclipsed by the continuous barrage of noise and distractions. Yet, located within the lyrical pages of **Constructing Logic Programs**, a fascinating function of literary brilliance that pulses with raw thoughts, lies an wonderful trip waiting to be embarked upon. Published by way of a virtuoso wordsmith, that interesting opus manuals readers on a psychological odyssey, lightly exposing the latent potential and profound influence stuck within the elaborate internet of language. Within the heart-wrenching expanse of the evocative evaluation, we shall embark upon an introspective exploration of the book is main styles, dissect their charming writing type, and immerse ourselves in the indelible effect it leaves upon the depths of readers souls.

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