

Functional Versus Logic Programming

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ABSTRACT

This paper describes the differences between functional programming and logic programming.

Keywords

Functional, Logic, Programming, Paradigm

1. INTRODUCTION

There are four main programming paradigms: imperative, functional, logic, and object-oriented. Of the four, functional and object-oriented are the most common, with imperative creeping its way into almost all modern languages as well. Logic programming is something that is less seen except in the AI (Artificial Intelligence) realm. However, each programming paradigm has positive and negative elements, and in this paper the functional and logic programming paradigms are discussed.

2. FUNCTIONAL PROGRAMMING

In functional programming, computations are carried out entirely through the evaluation of expressions. The claims are that functional programming more closely resembles mathematical logic, therefore should be easier to read. It is also said to be quicker to write and more concise [3].

Unlike imperative languages, functional languages are more declarative and are said to not have an implicit state. When a particular state is needed, a function could be called to get it, if the "state" terminology must be used. Additionally, functional languages are much less friendly in terms of memory and CPU usage compared to other programming paradigms.

3. LOGIC PROGRAMMING

Though logic programming bares a resemblance in syntax to functional programming due to the logic clauses being formatted similar to a function call, but the resemblance is only practical.

Though logic is used in relations in functional programming, this logic is different than the concept of the logic programming paradigm.

In logic programming, each step of the program is processed by analyzing a set of facts or rules, most commonly referred to as clauses. Storage is manipulated through the conditions held within the clauses. Prolog is the most widely known logic programming language [2].

Pure logic programming languages are known to be significantly slower than languages that use other programming paradigms [2].

4. CONCLUSIONS

There haven't been any new programming paradigms in recent years, and judging by the number of paradigms out there, it's unlikely any new paradigms will immerge. However, programming is constantly developing, and it's possible we may see the rise of other paradigms in the top four. However, more likely than not, the concepts of other programming paradigms, such as functional and logic already are, will become more present in higher-level paradigms such as object-oriented programming.

5. REFERENCES

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