Design and Implementation of a Runtime System for an Algol-Like Intermediate Compiler.

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Abstract:

Programming languages have been elevated to an abstract level by the development of higher level programming languages. The gap created by this abstraction between the users' programs and the machine is bridged by means of translation systems known as compilers and interpreters.

A programming language system - ALGOL-like language (ALL) that is modeled after the compiler-interpreter architecture has been designed and constructed. In this thesis, the runtime system for the intermediate compiler of ALL has been designed and implemented using two stacks (the main stack and the pointer stack) and a heap, the copying technique of garbage collection is used with the heap to simulate an infinite store.

The Reverse Polish Notation has been used as the internal language of the translation system. The runtime system has been implemented using PASCAL programming language. This implementation has resulted in an efficient runtime system with little operational requirements.

The major application areas of the programming language system are its use for introducing the concept of structured programming to beginners in computer science, and for enhancement of teaching of compiler/interpreter design and construction at undergraduate level.

Keywords: ALGOL-like language (ALL)/ programming language/ Reverse Polish Notation/ PASCAL programming language

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