# Code-Checker using ATP

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# 1 Proposed System

Code-Checker using Automated Theorem Proving is used for verifying the logical correctness of a C program. It involves formulating an error problem to be verified using a suitable logic. Theorem provers provide a rigorous and reliable approach to proving of correctness, enabling and establishing correctness of properties over infinite domains, properties about complex data structures, and properties of recursive structures etc.

In this system , the user will give his syntactically-correct program as an input to the Code Checker system. The system will check the correctness of the program by comparing its rules which are inbuilt in the system. It will then take appropriate action by displaying the correct output in the form of message.

## 1.1 Modules

- **User Interface**

  The user will submit the program to be verified. He/she can verify the correctness of their code and its logic by giving a source code as an input to the system. Code-Checker using ATP accepts C programs to be verified.

- **Verification Module**

  The system will take the C program from the user as input and it will check for logical errors present in the program. There errors include unreachable code blocks, infinite loops, infinite recursions, return value mismatch etc.

- **Notification Module**

  In this module, after verifying the program, the system will inform the user whether the C source code is logically correct or not. The interaction with the user is provided in the form of messages. If the program is verified correctly then a "Successfully verified" message will be displayed. Else, the system will give warnings, which are presented to the user in the form of error messages, according to which the user may modify their program. For beginners in coding, this will help them learn in an iterative fashion.