NASA TECH BRIEF

Marshall Space Flight Center

FORTRAN Automatic Code Evaluation System (FACES)

The problem:

More tools were desired to assist in the analyzing and debugging of FORTRAN computer programs.

The solution:

The FORTRAN Automatic Code Evaluation System (FACES) is a computer program written to serve as an automatic aid in analyzing and debugging FORTRAN programs.

How it's done:

FACES is a software package which takes as input a FORTRAN program which may contain many modules (subroutines and functions). The system is composed of two main parts: (1) the FORTRAN front end which gathers information about the input program and (2) a set of routines organized as a diagnostic package which evaluates the information and prints warning messages concerning actual or potential errors. All information for the analysis is at present obtained statically from the source code of the FORTRAN program. Extensions to the system can be made to include dynamic traces and the run-time analyzers.

The FORTRAN front end scans and parses the FORTRAN input program, gathering information about the source code as parsing is done. A graph structure of each routine analyzed is formed, and information concerning interface between routines is gathered. This information is then stored in sets of tables.

The second portion of the FACES system consists of a set of diagnostic routines which analyzes the information that is stored in the tables, looking for possible danger signs and analyzing for particular types of problems in a program. Each routine may be optionally chosen for execution by the user. The four diagnostic routines developed under this contract are: (1) the verification of correct parameter alinement between routines, (2) the verification of common block alinement, (3) the analysis of variable initialing, and (4) a trace of the future and history of specified variables.

Notes:

1. This program was written in FORTRAN V for the UNIVAC 1100 computer system.
2. Inquiries concerning this program should be directed to:

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