TEC_TO_FEM
Convert TECPLOT Finite Element Files to FEM Format

TEC_TO_FEM is a FORTRAN90 program which reads a TECPLOT file defining a finite element dataset, and writes a corresponding set of FEM files.

Usage:

tec_to_fem *file.dat*
reads the TECPLOT ASCII file *file.dat* and creates the FEM files *file.node_coord.txt*, *file.element.txt* and *file.node_data.txt*.

Licensing:

The computer code and data files made available on this web page are distributed under the GNU LGPL license.

Languages:

TEC_TO_FEM is available in a FORTRAN90 version and a MATLAB version.

Related Data and Programs:

FEM2D, a data directory which contains a description of the data files that can be used to describe a 2D finite element model.

FEM_IO, a FORTRAN90 library which may be used to read or write a set of FEM files.

FEM_TO_TEC, a FORTRAN90 program which can convert an FEM model into a TEC graphics file.

TEC, a data directory which contains a description of TECPLOT files.

TEC_IO, a FORTRAN90 library which may be used to read or write a TECPLOT file definite a finite element dataset.

TEC_TO_OBJ, a FORTRAN90 program which can read a TECPLOT file describing a surface in 3D composed of triangles or quadrilaterals, and write an OBJ file.

TEC_WRITE, a FORTRAN90 library which can write TEC files.

TRIANGLE_TO_FEM, a C++ program which reads the NODE and ELE files created by TRIANGLE to describe a triangular mesh, and writes a corresponding pair of node and element files in the 2D FEM format.

Reference:

1. Hans Rudolf Schwarz,
   Methode der Finiten Elemente,
   Teubner Studienbuecher, 1980.
2. Gilbert Strang, George Fix,
   An Analysis of the Finite Element Method,
   Prentice Hall, 1973.
3. Tecplot, Inc,
   TECPLOT Reference Manual,
   Version 10, Release 4,
   Tecplot, Inc, 2005.
4. Tecplot, Inc,
   TECPLOT User's Manual,
   Version 10,
   Tecplot, Inc, 2005.
5. Olgierd Zienkiewicz,
   The Finite Element Method,
   McGraw Hill, Third Edition, 1977.
6. Daniel Zwillinger, editor,
   Standard Mathematical Tables and Formulae,
   30th Edition,
   CRC Press, 1996.

Source Code:

- tec_to_fem.f90, the source code.

Examples and Tests:

TINY is a "tiny" dataset.

- tiny.dat, a TECPLOT ASCII file defining the dataset.
- tiny.nodes.txt, the FEM file containing the node coordinates.
- tiny.elements.txt, the FEM file containing the elements.
- tiny.values.txt, the FEM file containing the node data.

List of Routines:

- **MAIN** is the main program for TEC_TO_FEM.
- **CH_CAP** capitalizes a single character.
- **CH_EQI** is a case insensitive comparison of two characters for equality.
- **CH_TO_DIGIT** returns the integer value of a base 10 digit.
- **DTABLE_DATA_WRITE** writes data to a double precision table file.
- **DTABLE_HEADER_WRITE** writes the header to a double precision table file.
- **FEM_WRITE** writes data files associated with a finite element solution.
- **FILE_NAME_EXT_GET** determines the "extension" of a file name.
- **FILE_NAME_EXT_SWAP** replaces the current "extension" of a file name.
- **GET_UNIT** returns a free FORTRAN unit number.
- **ITABLE_DATA_WRITE** writes data to an integer table file.
- **ITABLE_HEADER_WRITE** writes the header to an integer table file.
- **S_BEGIN** is TRUE if one string matches the beginning of the other.

- **S_BEHEAD_SUBSTRING** "beheads" a string, removing a given substring.
- **S_BLANK_DELETE** removes blanks from a string, left justifying the remainder.
- **S_EQI** is a case insensitive comparison of two strings for equality.
- **S_INDEX_LAST** finds the LAST occurrence of a given substring.
- **S_REPLACE_CH** replaces all occurrences of one character by another.
- **S_TO_I4** reads an I4 from a string.
- **S_TO_R8** reads an R8 from a string.
- **S_WORD_COUNT** counts the number of "words" in a string.
- **S_WORD_EXTRACT** extracts the next word from a string.
- **TEC_DATA_READ** reads the data from a TEC file.
- **TEC_HEADER_PRINT** prints the header to a TEC file.
- **TEC_HEADER_READ** reads the header from a TEC file.
- **TEC_TO_FEM_HANDLE** reads data from a TECPLOT file and writes FEM files.
- **TEC_ZONE_LINE_PARSE** parses the "ZONE" line of a TEC file.
- **TIMESTAMP** prints the current YMDHMS date as a time stamp.
- **TIMESTRING** writes the current YMDHMS date into a string.

You can go up one level to the FORTRAN90 source codes.

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