# GMSH\_TO\_FEM  Convert Mesh Data from GMSH to FEM Format.

**GMSH\_TO\_FEM** is a FORTRAN90 program which reads a mesh data file created by the GMSH program and writes a pair of node and element files that correspond to the FEM format.

### Usage:

**gmsh\_to\_fem** *prefix*

where *prefix* is the common filename prefix so that:

* *prefix***.msh** contains the GMSH mesh data file.
* *prefix***\_nodes.txt** will be the FEM node file created by the program.
* *prefix***\_elements.txt** will be the FEM element file created by the program.

### Licensing:

The computer code and data files described and made available on this web page are distributed under [the GNU LGPL license.](https://people.sc.fsu.edu/~jburkardt/txt/gnu_lgpl.txt)

### Languages:

**GMSH\_TO\_FEM** is available in [a C version](https://people.sc.fsu.edu/~jburkardt/c_src/gmsh_to_fem/triangle_to_fem.html) and [a C++ version](https://people.sc.fsu.edu/~jburkardt/cpp_src/triangle_to_fem/triangle_to_fem.html) and [a FORTRAN77 version](https://people.sc.fsu.edu/~jburkardt/f77_src/triangle_to_fem/triangle_to_fem.html) and [a FORTRAN90 version](https://people.sc.fsu.edu/~jburkardt/f_src/triangle_to_fem/triangle_to_fem.html) and [a MATLAB version](https://people.sc.fsu.edu/~jburkardt/m_src/triangle_to_fem/triangle_to_fem.html).

### Related Data and Programs:

[DOLFIN-CONVERT](https://people.sc.fsu.edu/~jburkardt/py_src/dolfin-convert/dolfin-convert.html), a Python program which can convert a mesh file from Gmsh, MEDIT, METIS or SCOTCH format to an XML format suitable for use by DOLFIN or FENICS, by Anders Logg.

[FEM\_IO](https://people.sc.fsu.edu/~jburkardt/f_src/fem_io/fem_io.html), a FORTRAN90 library which reads or writes node, element and data files defining a model associated with the finite element method (FEM).

[FEM\_TO\_GMSH](https://people.sc.fsu.edu/~jburkardt/f_src/fem_to_gmsh/fem_to_gmsh.html), a FORTRAN90 program which reads FEM files definining a 1D, 2D or 3D mesh, namely a file of node coordinates and a file of elements defined by node indices, and creates a Gmsh mesh file.

[FEM2D](https://people.sc.fsu.edu/~jburkardt/data/fem2d/fem2d.html), a data directory which contains examples of 2D FEM files, a pair of files defining the coordinates of nodes, and the nodes that form triangular elements.

[GMSH](https://people.sc.fsu.edu/~jburkardt/examples/gmsh/gmsh.html), examples which illustrate the use of the Gmsh program, a 1D, 2D or 3D mesh generator that can create meshes suitable for use by the finite element method (FEM).

[GMSH\_IO](https://people.sc.fsu.edu/~jburkardt/f_src/gmsh_io/gmsh_io.html), a FORTRAN90 library which can read or write some of the files created by the Gmsh program for 1D, 2D or 3D meshes used by the finite element method (FEM).

[MEDIT\_TO\_FEM](https://people.sc.fsu.edu/~jburkardt/f_src/medit_to_fem/medit_to_fem.html), a FORTRAN90 program which reads a mesh file created by the MEDIT program and writes a corresponding pair of node and element files that correspond to the FEM format.

[TEC\_TO\_FEM](https://people.sc.fsu.edu/~jburkardt/f_src/tec_to_fem/tec_to_fem.html), a FORTRAN90 program which converts a tecplot ASCII file into an FEM model.

[TRIANGLE\_TO\_FEM](https://people.sc.fsu.edu/~jburkardt/f_src/triangle_to_fem/triangle_to_fem.html), a FORTRAN90 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.

[XML\_TO\_FEM](https://people.sc.fsu.edu/~jburkardt/py_src/xml_to_fem/xml_to_fem.html), a Python program which reads an XML file created by FENICS or DOLFIN, describing a mesh in 1D, 2D, or 3D, and creates corresponding FEM files, namely, a file of node coordinates, and a file of element connectivities.

### Source Code:

* [gmsh\_to\_fem.f90](https://people.sc.fsu.edu/~jburkardt/f_src/gmsh_to_fem/gmsh_to_fem.f90), the source code.

### Examples and Tests:

* [example\_2d.msh](https://people.sc.fsu.edu/~jburkardt/f_src/gmsh_to_fem/example_2d.msh), a sample 2D GMSH mesh file.
* [example\_2d\_nodes.txt](https://people.sc.fsu.edu/~jburkardt/f_src/gmsh_to_fem/example_2d_nodes.txt), the FEM node file created by the program.
* [example\_2d\_elements.txt](https://people.sc.fsu.edu/~jburkardt/f_src/gmsh_to_fem/example_2d_elements.txt), the FEM element file created by the program.

### List of Routines:

* **MAIN** is the main program for GMSH\_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.
* **GET\_UNIT** returns a free FORTRAN unit number.
* **GMSH\_DATA\_READ** reads sizes from a GMSH file.
* **GMSH\_SIZE\_READ** reads sizes from a GMSH file.
* **I4MAT\_WRITE** writes an I4MAT file.
* **R8MAT\_WRITE** writes an R8MAT file.
* **S\_BEGIN** is TRUE if one string matches the beginning of the other.
* **S\_TO\_I4** reads an I4 from a string.
* **S\_TO\_R8** reads an R8 from a string.
* **TIMESTAMP** prints the current YMDHMS date as a time stamp.

You can go up one level to [the FORTRAN90 source codes](https://people.sc.fsu.edu/~jburkardt/f_src/f_src.html).

*Last revised on 19 October 2014.*

# GMSH\_TO\_FEM  将网格数据从GMSH 转换为FEM格式。

**GMSH\_TO\_FEM** 是FORTRAN90程序，它读取由GMSH程序创建的网格数据文件，并写入一对与FEM格式对应的节点和元素文件。

### 用法：

**gmsh\_to\_fem***前缀*

其中*prefix*是常用的文件名前缀，以便：

* *前缀***.msh**包含GMSH网格数据文件。
* *prefix***\_nodes.txt**将是程序创建的FEM节点文件。
* *prefix***\_elements.txt**将是程序创建的FEM元素文件。

### 许可：

在此网页上描述和提供的计算机代码和数据文件是在[GNU LGPL许可](https://people.sc.fsu.edu/~jburkardt/txt/gnu_lgpl.txt)下分发 [的。](https://people.sc.fsu.edu/~jburkardt/txt/gnu_lgpl.txt)

### 语言：

**GMSH\_TO\_FEM**提供 [C版本](https://people.sc.fsu.edu/~jburkardt/c_src/gmsh_to_fem/triangle_to_fem.html)和 [C ++版本](https://people.sc.fsu.edu/~jburkardt/cpp_src/triangle_to_fem/triangle_to_fem.html)以及 [FORTRAN77版本](https://people.sc.fsu.edu/~jburkardt/f77_src/triangle_to_fem/triangle_to_fem.html)和 [FORTRAN90版本](https://people.sc.fsu.edu/~jburkardt/f_src/triangle_to_fem/triangle_to_fem.html)以及 [MATLAB版本](https://people.sc.fsu.edu/~jburkardt/m_src/triangle_to_fem/triangle_to_fem.html)。

### 相关数据和程序：

[DOLFIN-CONVERT](https://people.sc.fsu.edu/~jburkardt/py_src/dolfin-convert/dolfin-convert.html)，一个Python程序，可以将网格文件从Gmsh，MEDIT，METIS或SCOTCH格式转换为适合由DOLFIN或FENICS使用的XML格式，由Anders Logg提供。

[FEM\_IO](https://people.sc.fsu.edu/~jburkardt/f_src/fem_io/fem_io.html)，FORTRAN90库，读取或写入定义与有限元方法（FEM）相关的模型的节点，元素和数据文件。

[FEM\_TO\_GMSH](https://people.sc.fsu.edu/~jburkardt/f_src/fem_to_gmsh/fem_to_gmsh.html)，FORTRAN90程序，读取定义1D，2D或3D网格的FEM文件，即节点坐标文件和节点索引定义的元素文件，并创建Gmsh网格文件。

[FEM2D](https://people.sc.fsu.edu/~jburkardt/data/fem2d/fem2d.html)，一个数据目录，包含2D FEM文件的示例，一对定义节点坐标的文件，以及形成三角形元素的节点。

[GMSH](https://people.sc.fsu.edu/~jburkardt/examples/gmsh/gmsh.html)，说明使用Gmsh程序的示例，1D，2D或3D网格生成器，可以创建适合有限元方法（FEM）使用的网格。

[GMSH\_IO](https://people.sc.fsu.edu/~jburkardt/f_src/gmsh_io/gmsh_io.html)，一个FORTRAN90库，可以读取或写入由Gmsh程序创建的一些文件，用于有限元法（FEM）使用的一维，二维或三维网格。

[MEDIT\_TO\_FEM](https://people.sc.fsu.edu/~jburkardt/f_src/medit_to_fem/medit_to_fem.html)，一个FORTRAN90程序，它读取由MEDIT程序创建的网格文件，并写入对应于FEM格式的相应的一对节点和元素文件。

[TEC\_TO\_FEM](https://people.sc.fsu.edu/~jburkardt/f_src/tec_to_fem/tec_to_fem.html)，FORTRAN90程序，将tecplot ASCII文件转换为FEM模型。

[TRIANGLE\_TO\_FEM](https://people.sc.fsu.edu/~jburkardt/f_src/triangle_to_fem/triangle_to_fem.html)，一个FORTRAN90程序，它读取由triangle（）创建的NODE和ELE文件来描述三角形网格，并以2D FEM格式写入相应的一对节点和元素文件。

[XML\_TO\_FEM](https://people.sc.fsu.edu/~jburkardt/py_src/xml_to_fem/xml_to_fem.html)，一个Python程序，它读取由FENICS或DOLFIN创建的XML文件，描述1D，2D或3D中的网格，并创建相应的FEM文件，即节点坐标文件和元素连接文件。

### 源代码：

* [gmsh\_to\_fem.f90](https://people.sc.fsu.edu/~jburkardt/f_src/gmsh_to_fem/gmsh_to_fem.f90)，源代码。

### 示例和测试：

* [example\_2d.msh](https://people.sc.fsu.edu/~jburkardt/f_src/gmsh_to_fem/example_2d.msh)，示例2D GMSH网格文件。
* [example\_2d\_nodes.txt](https://people.sc.fsu.edu/~jburkardt/f_src/gmsh_to_fem/example_2d_nodes.txt)，由程序创建的FEM节点文件。
* [example\_2d\_elements.txt](https://people.sc.fsu.edu/~jburkardt/f_src/gmsh_to_fem/example_2d_elements.txt)，由程序创建的FEM元素文件。

### 例程列表：

* **MAIN**是GMSH\_TO\_FEM的主程序。
* **CH\_CAP**将单个字符大写。
* **CH\_EQI**是对两个字符进行不区分大小写的比较。
* **CH\_TO\_DIGIT**返回基数为10的整数值。
* **GET\_UNIT**返回一个免费的FORTRAN单元号。
* **GMSH\_DATA\_READ**从GMSH文件中读取大小。
* **GMSH\_SIZE\_READ**从GMSH文件中读取大小。
* **I4MAT\_WRITE**写入I4MAT文件。
* **R8MAT\_WRITE**写入R8MAT文件。
* 如果一个字符串与另一个字符串的开头匹配，则**S\_BEGIN**为TRUE。
* **S\_TO\_I4**从字符串中读取I4。
* **S\_TO\_R8**从字符串中读取R8。
* **TIMESTAMP**将当前YMDHMS日期打印为时间戳。

您可以上一级到[FORTRAN90源代码](https://people.sc.fsu.edu/~jburkardt/f_src/f_src.html)。

*最后修订于2014年10月19日。*