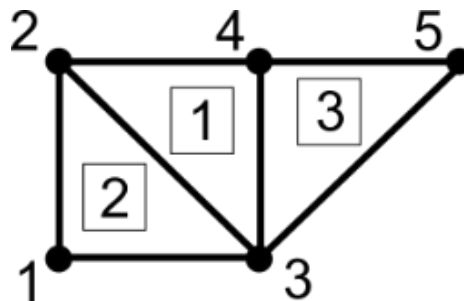# Task description

The task in this homework is to write a program that can convert an ASCII file format to another ASCII format in such a way that

- the program can detect any problem with the input file;
- the output file is syntactically correct; and
- the output file preserves the semantics, the meaning of the information in the input file.

The input file contains a surface model of an object, where the surface is represented by triangles. This kind of models are also called meshes. A mesh has geometric information, like coordinates of points and a mesh also contains topology, the description of the triangle elements and possibly their relation to each other. The triangle elements are specified by the id number of its points.

Lets take an example. A mesh is shown in the figure below:

This mesh has 3 triangle elements and 5 points. This mesh can be described in an ASCII file as the following:

```
NUMBER OF POINTS 5
1     0.0   0.0   0.0
2     0.0   1.0   0.0
3     1.0   0.0   0.0
4     1.0   1.0   0.0
5     2.0   1.0   0.0
NUMBER OF TRIANGLES 3
1     3     4     2
2     1     3     2
3     5     4     3
```

Please pay attention to the index numbers. In this format the node number and the element number is explicitly specified. In other formats it is not specified explicitly, but assumed by the order of specification. It is also possible that the starting index is one or zero.

Although most of the file formats can handle several elements, the program has to handle only triangle elements!

Some further requirements:

The written program must be **general**, therefore it should be able to perform the conversion of files with different meshes, not only the example mesh. For example, for most file formats, it can be assumed, that any number of spaces may be placed between the data. Another feature to cause

variation is that all empty lines should be ignored. Comments in the file should also be ignored. Coordinate numbers can be integers or real numbers. And so on. These variations **should not** cause any problem during the conversion.

All solutions should be your own, not copied from somebody else or from the Internet. Any copying is considered as **plagiarism** and it will result in the immediate failure of the course!!!