Exercises for the introduction to the Grid Interface

Exercise 1 Constructing Dune grids

In this exercise you should experiment with constructing different grids. The file `exercise_grid2.cc` contains a code, which

- defines the `GridType` to one of a list of available Dune grids
- constructs a grid either through one of the three basic factory concepts:
  - `StructuredgridFactory` for equidistant grids
  - `GmshReader` for unstructured grids
  - `TensorGridFactory` for tensor product grids
- potentially refines the grid once globally (disabled by default)
- fills a data structure that maps each cell to its index in the index set.
- Outputs this data structure to a vtk file which can be visualized in `paraview`

Try to construct as many different grids as possible and look at the result in paraview. Here are some questions to guide your exploration of grid construction:

- Find out (visually) how the elements in a `YaspGrid` are ordered in the index set.
- Construct a structured grid with an unstructured grid manager
- Load an unstructured grid from one of the `.msh` files you find in the exercise directory.
- Construct a `YaspGrid` for the domain $[-1, 1]^2$
- Enable the global refinement in the code and observe the effect on the index set for structured and unstructured grids.
- Build a tensor product `YaspGrid` with and without global refinement. What do you observe?