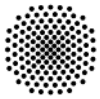

Universität Stuttgart

BASEGEM BETA 1

TUTORIAL

DIEGO BERAMENDI ORTEGA

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● STUTTGART - GERMANY ●

BASEGEM BETA 1 Tutorial

The first step is to create a project folder that contains an *initial model.json* file and a *mesh.2dm* file, whose name for this example is '*finalmeshfive.2dm'*.

Important elements of the *initial model.json* file are:

"discharge": 9.5

"default_friction": 35.0

"simulation_name": "mySim"


```
"HYDRAULICS": {
  "BOUNDARY": {
    "STANDARD": [
      {
        "discharge": 9.5,
        "name": "Inflow",
        "slope": 0.0056,
        "string_name": "Inflow",
        "type": "uniform_in"
      },
      {
        "name": "Outflow",
        "string_name": "Outflow",
        "type": "zero_gradient_out"
      }
    ]
  },
  "FRICTION": {
    "default_friction": 35.0,
    "regions": [
      {
        "friction": 35.0,
        "region_name": "riverbed"
      },
      {
        "friction": 45.0,
        "region_name": "concreteweir"
      }
    ],
    "type": "strickler"
  },
                                    },
                                    "simulation_name": "mySim"
```


Fig. 1 – Initial model.json file, important: discharge, default_friction values, simulation_name: "mySim".

We start the application *Basegem Beta 1* from the command prompt (**basegem.py**). The GUI of the app will be displayed:

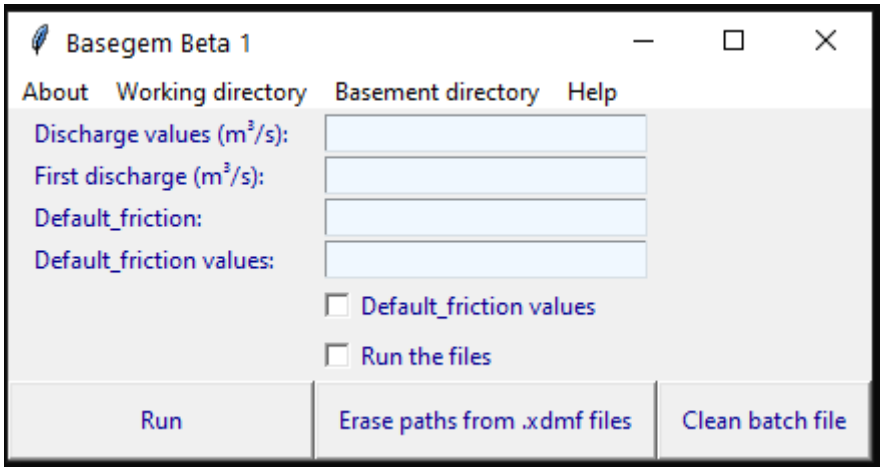

Fig. 2 – GUI from Basegem Beta 1.

First, the Working directory has to be selected, then immediately the *results.json* and *simulation.json* file are copied from the *Basegem Beta 1* folder to the select directory:

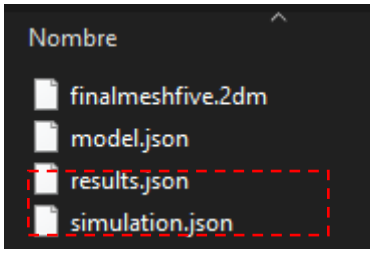

Fig.3 – Content of the working directory.

The installation path of Basement must be selected. Normally if it is stored in the 'C' drive it looks like this: *"C:/Program Files/BASEMENT 3.1.0/bin".*

In the working directory a *backup.txt* was created containing the installation path of basement; so from now on, that directory is not necessary to be selected any more since Basegem will read it from the *backup.txt* file.

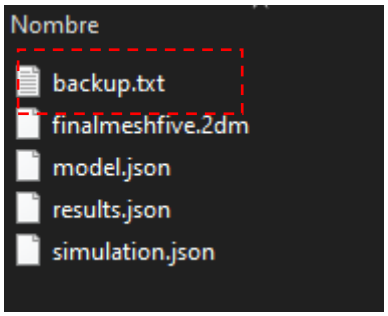

Fig. 4 – Backup.txt file in working directory.

We will create *model.json* files with the following discharge values: 9.50 12.75 15.50 . The first discharge value corresponds to the value from the *initial model.json file*, which is 9.5, and the *default_friction* is equal to 35.0. As we want to run the files immediately, the *Run the files* checkbox is marked.

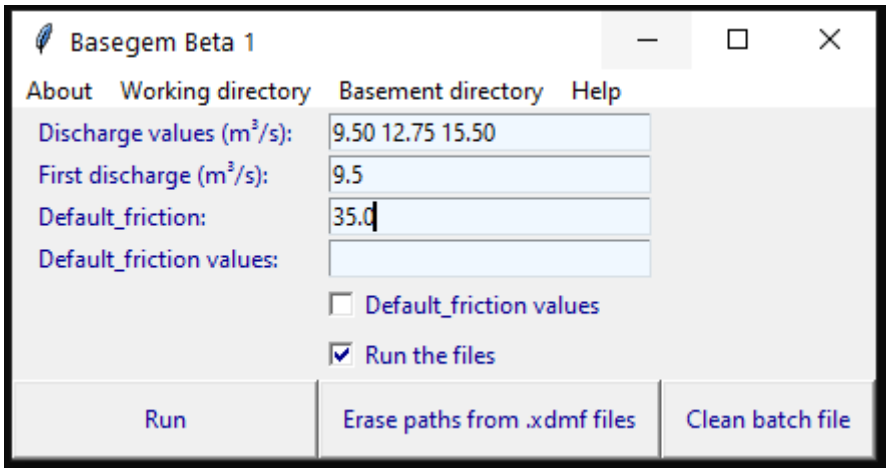

Fig. 5 – GUI with input data.

As soon as we press the button *Run* three folders named Q9_50, Q12_75 and Q15_50 are created, containing the modified *model.json* files, together with the *results.json* and *simulation.json* files and Basement will run them in batch mode.

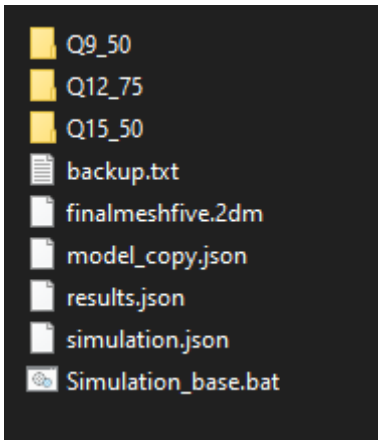

Fig. 6 – Working directory with folders of the scenarios created.

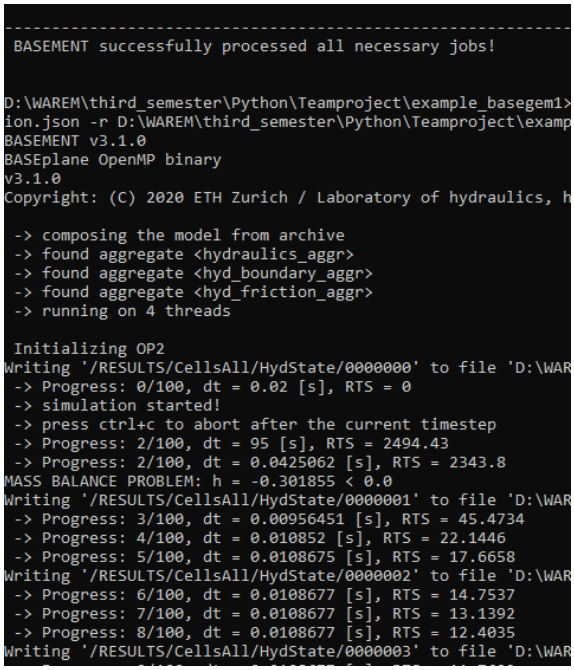

Fig. 7 – Initialization of the batch running of Basement.

Additionally, the *Simulation_base.bat* is created.

If the checkbox *Run the files* is not marked before pressing the *Run* button, the simulation can still be started by double-clicking on the *Simulation_base.bat* file. Then, the paths from the .xdmf files can be erased with the *Basegem Beta 1* application. It simply has to be started, then the directory has to be selected and the button *Erase path from .xdmf files* has to be pressed.

It is important to mention that when a simulation scenario ends the system will ask to press a key in order to continue with the next scenario. This can be avoided by deleting the *Pause* word from the code of the *basegem.py* script between the line 306 and 325.

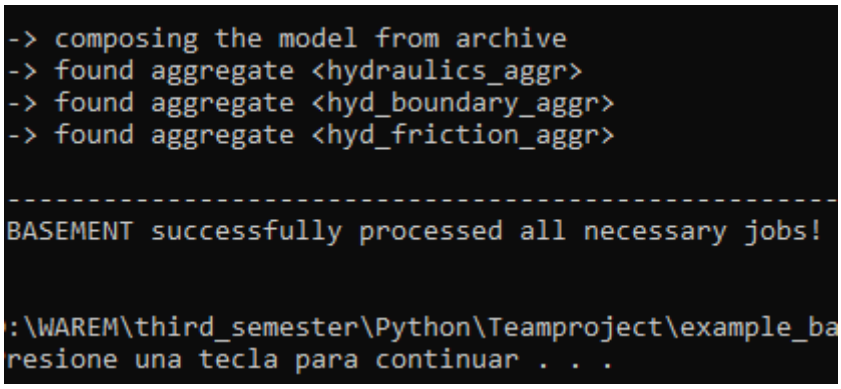

Fig. 8 – Communication of Basement on the successful process.

The results are showed below. Now the *results.xdmf* files of every scenario can be seen in *Paraview* and *Qgis* and then convert them into *raster.tiff* maps to be used as data for the *Aquafuzzy* package.

```
D:\WAREM\third_semester\Python\Teamproject\example_basegem1>PAUSE
Presione una tecla para continuar . . .
D:\WAREM\third_semester\Python\Teamproject\example_basegem1\Q12_75\mySim_output.xdmf
D:\WAREM\third_semester\Python\Teamproject\example_basegem1\Q15_50\mySim_output.xdmf
D:\WAREM\third_semester\Python\Teamproject\example_basegem1\Q9_50\mySim_output.xdmf
The paths from .xdmf files were deleted
model_copy.json has changed to model.json
basement_generator took 1906.218 seconds
```

Fig. 9 – End of the batch process of Basement.

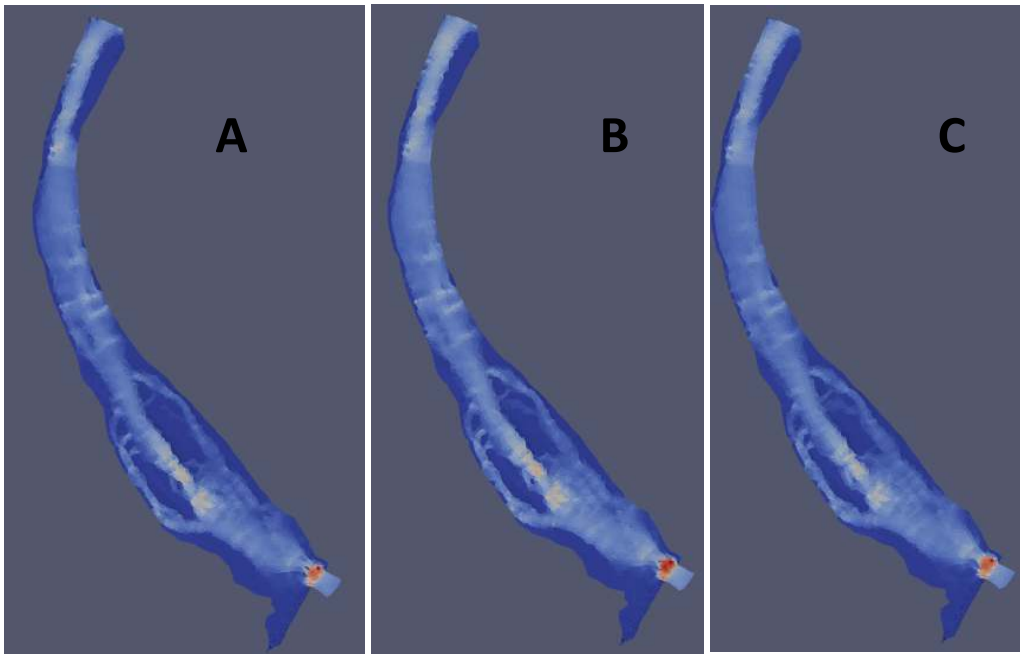

Fig. 10 - .xdmf files loaded in Paraview. A=Q9_50, B=Q12_75 and C=Q15.50

If different *discharge values* and different *default_friction* values are required, the entry box *Default_friction values* must be filled in and the check box of the same name has also to be marked.

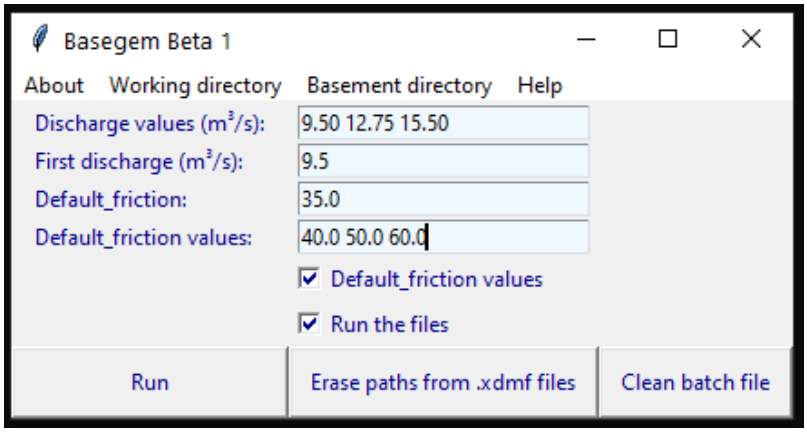

Fig. 11 – GUI with discharge values and default_friction values.

In order to clean *Simualtion_base.bat* file, the application can be started, the working directory selected and then the button *Clean batch file* pressed.