How to use “project.py”

First and foremost here are the requirements for project.py:

1. Properly installed Python3, numpy, and matplotlib. The PDF “Research Setup” runs through all installation steps.
2. Requires both f_flow and r_flow txt files there should have been some with the extraction of the summer2020.tar file. If not look at the PDF “Using Flopy” in order to create some r_flow and flow txt files.

Now once you have all that set up type in the terminal: “python3 project.py”

It should prompt you with the following:

“Number of time periods: ” – Here you must input the amount if time periods the input files have. You can check the amount of time periods by looking at the input files.

For Example: “r_flow2.txt” if this is the highest number for the input files then you have 3 time periods. (2 + 1 = 3 time periods).

“Number of Nodes” – Input the amount of nodes(or cells) that will be shown in the graphs. To determine you must figure out the dimensions. You can look at the dimension in tutorial02.py and look at nrow and ncol variables.

For example: If you are working with a 20 by 20 grid then the amount of the nodes will be 400. (20 x 20 = 400).

“What is the width of the graph:” – This is based on the previous prompt of amount of nodes. So this is based on the dimension width. You can look at the input file for r_flow since that will determine width. You can also look at tutorial02.py and look at nrow variable. That will be the width.

For example: If grid is 20 by 20 then width is 20.

“Which time period do you want to look at?”- This is your decision and based on what time period you want to look at. The higher time period will give you a better results for graphs since there will be more time elapsed of water passing.

Example:

time period 1- Initial day or 0 days.

Time period 2 – 0 – 100 days elapsed.

Time period 3 – 100 – 200 days elapsed.

After setup you will get a Main menu

1 – Display Neighbors – Shows direction flow results for a designated cell.

2 – Fraction Through – Percentage of Flow that is receive for a cell reaching a designated cell.

3 – Flow Rate Through – Flow that passed through cells reaching a designated cell.

4 – Flow Rate From – Flow that originated from each cell before reaching a designated cell.

5 – Storage Amount – Amount of flow stored for each cell based on a designated cell.

6 – External Source – Amount of flow outside of the region monitored.

7 – Change time period – allows you to change time period you want to look at now if there are several time periods.

The designated cell is your choice to experiment will. To get good results with the graph we want to test it with a well point that is in the region for these graphs.

To find the well point refer to “tutorial2-2.png” this represents time period 3 and shows the flow direction as well as the location of the well and the flow being move into the well.

This should give plenty of understanding of the code you will receive however, since these tutorials can do so much. Please feel free to consult with your faculty mentors with any questions, they will be happy to answer where it will be simple or complex. Also not to mention have fun with this research it is a wonderful experience any second you spend with it is a development towards this research.