Hydroinformatics

Cohort 2019-2021

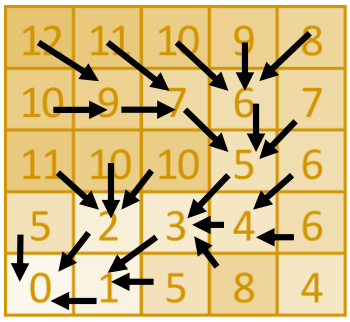
Assignment – Transversal Exercise project (30% of module)

Objective: to consolidate the programming knowledge acquired during the sessions with regards conditionals, loops, file manipulation and functions, as well as matrix manipulation with Python.

Deadline: Upload your submission (zip file) to eCampus **before 13 January 2020, 8.45.**

Material: Transversal Exercises slides presented in class, and file *Distributed_P.txt*, both available in eCampus.

Instructions:
Create Python codes using Spyder to calculate the discharge at the outlet (cell *u*) of the simplified catchment in Figure 1, if the precipitation event stored in the file *Distributed_P.txt* falls over the catchment (consider all details that were explained in class and reported in the Transversal Exercise slides).



(a)

a	b	c	d	e
f	g	h	i	j
k	l	m	n	o
p	q	r	s	t
u	v	w	x	y

(b)

Figure 1. (a) elevations and flow directions; (b) cell names

Deliverables in zip file:
1) Resulting files and/or folders. make sure you accommodate all in a ZIP file.
2) A report that includes:
   a) A Short description of the exercise
   b) An example of the calculation of the resulting discharge produced by cell *h* for the first three time steps (1, 2, and 3). Use the same variable names you use in your code.
   c) The graph t vs Q at the outlet (cell *u*).
   d) The answer to the questions below.

Questions
1) You have read the precipitation from the text file *Distributed_P.txt* and stored it in the variable *Precip*. What is the Python expression to get the precipitation value of cell *i*=3, *j*=4 at time step 5? What is this value?
2) How the graph t vs Q would look like if all tanks are empty at the beginning, (i.e., if Q_{t-1} = 0, instead of 10)

If you find it necessary, include graphs, figures or any additional analyses to support your answers.

Bonus (+0.5 points)
Create and use your own objects, as you wish, to solve the problem. Explain what you do in the report.