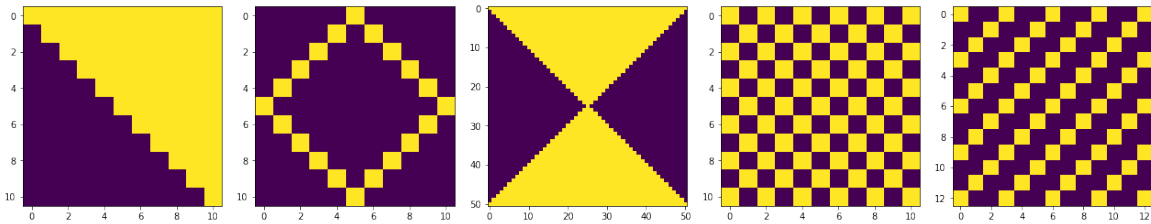


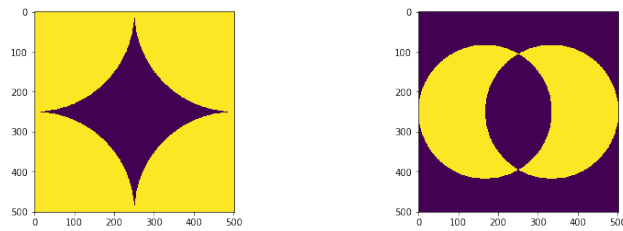
Homework Assignment 2

Part I

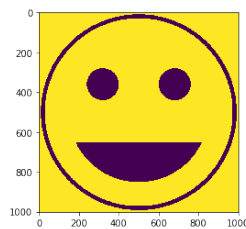
Start a new Jupyter notebook and generate the following four images. Copy over any commands from the lab assignment that you need (15pts):



Continue in the same notebook and reproduced the following two images (6pts):

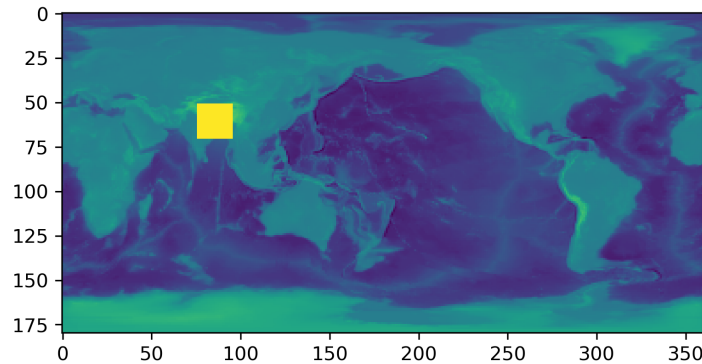


Finally, here is an **optional assignment for extra credit** (10pts). Please only attempt it if you need a challenge and have too much time on your hands.



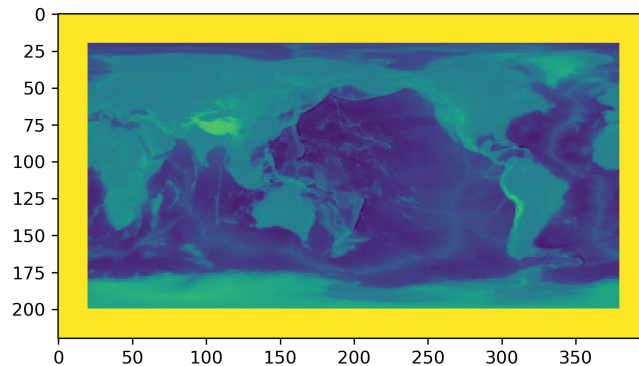
Part II

a) Please load the topography file "topography_180x360_grid.txt". Write some code to determine the coordinates of the highest point in the data set. This should be close to Mt. Everest. Print the coordinates and the elevation at that point. Mark this location with a yellow square and reproduce the following image (4pts):



b) Continue your notebook and determine the deep point in the oceans. Mark it with a dark blue square and display your image (4pts):

c) Finally put a frame around your world map and reproduce this image (3pts):



When you are finished, click "Kernel->Restart & Run All" and submit only long your Jupyter notebook to bCourses.

Part III

Surface area of a sphere (4pts): The purpose of this part is to prepare you for the next computer lab where we want to compute the volume and the surface area of the world's oceans. The surface area, A , of a sphere with radius R is given by

$$A = 4 \pi R^2$$

Re-derive this formula and write down the three essential steps. This formula is usually derived from a double integral over the polar angle ϕ and the azimuthal angle θ . Find it on the internet or look it up elsewhere.

Please submit your solution as a separate file. Either use MS Equation Editor, type your solution in plain text, or write it down on paper and scan it.