

GEO111 – NUMERICAL SKILLS IN GEOSCIENCE

week #05: (Further) loops, conditionals, and algorithms

Friday 25th April 2016

Work plan

The purpose of this week is to hopefully solidify your understanding of, and practical coding skills in, applying loops and conditionals, and to further develop your intuition regarding the construction algorithms and how to go about problem solving.

Specifically: make sure that you have worked through all the examples surrounding the global bathymetry dataset:

1. Pages 41-42, and very simple 2D plotting using the `image` function.
2. Pages 60-63, and the creation of a function to calculate the area of a cell on the Earth surface, and application in calculating e.g. global land (and future sea-level change vulnerable) area.
3. Pages 63-70 – creating an algorithm to count and label (number) all the separate land masses on Earth (but initially taking a simple low resolution model grid to work with).

If you have not already glanced through the following sections of the 2 background reading texts, do so:

- **MATLAB®7 – Getting Started Guide**

- *Programming – Scripts and Functions* – pages 4-20 through 4-23

- **MATLAB – A Practical Introduction to Programming and Problem Solving**

- *Nested for loops* – pages 155-162

Also: make sure you are happy with plotting histograms (earlier example in the course text involving an earthquake dataset, and also see the 'Getting Started' Guide and/or 'A Practical Introduction ...'..

Learning goals (aka: 'what specifically should I have got to grips with?')

Topics and methodologies you should be familiar with:

- functions (a 'special' case of an **m-file**)
- nested loops
- partial sums and counting variables