Topics in Advanced Applied Geophysics:

Practical 1 – Eibl

Write a python code that solves the 5 tasks below. Please submit your code and images via myAberdeen by March, 16th 17:00.

- If you would like to develop your code online, go to: https://try.jupyter.org/
- Option 1: Click on "Try Jupyter with Python"

  Shift + Enter: Execute cell and jump to the next cell

  Ctrl/Cmd + Enter: Execute cell and don't jump to the next cell
- Option 2: Click on "Try JupyterLab"

  Click on 'file' → 'new' → 'Python 3'

  Type your code in the console

  Shift + Enter: Execute cell and jump to the next cell

  Ctrl/Cmd + Enter: Execute cell and don't jump to the next cell
- Getting help by using ? operator after an object: 'print?'
- Google! You're not the first one with the problem

1. Write a program that asks the user for their name and greets them. Only the users Alice and Bob are greeted with their names all others are greeted without name.
2. Write a program that asks the user for a number n and prints the sum of the numbers 1 to n. But: only multiples of three or five are considered in the sum, e.g. 3, 5, 6, 9, 10, 12, 15 for n=17
3. Write a guessing game where the user has to guess a secret number. After every guess the program tells the user whether their number was too large or too small. At the end the number of tries needed should be printed alongside the correct guess.
4. Write a function that combines two lists by alternatingly taking elements, e.g. [a,b,c], [1,2,3] → [a,1,b,2,c,3]. Check that the lists have the same length. Add a docstring.
5. Write a function A (with docstring) that takes a NumPy array x and a and b and returns $f(x)=ax^3+b$
   Write a second function B (with docstring) that takes a NumPy array x and a and b and returns $f(x)=-ax^3-b$

   Plot the result of the two functions with matplotlib. Color A with a dotted red line and B with a dashed blue line. Label the x and y axis and add a legend in the upper right corner to label the curves A and B. Hint: to display the plot you need "plt.show()" as last line.