Assignment 5

due Thursday 7 November 2019

Write definitions for each of the following Python functions, and for each function, include a clear and concise comment to describe its purpose. Store all the function definitions in a single file named `a5.py`.

1. `peaks(numlist)`
   Return the list of elements in the numeric list `numlist` which exceed all previous elements.

   ```
   peaks([3, 2, 5, 5, 7, 6, 1, 8, 4]) ==> [3, 5, 7, 8]
   peaks([1, 2, 3, 4, 5, 6, 7, 8, 9]) ==> [1, 2, 3, 4, 5, 6, 7, 8, 9]
   peaks([9, 8, 7, 6, 5, 4, 3, 2, 1]) ==> [9]
   peaks( 5, 5, 5, 5, 5, 5, 5, 5, 5]) ==> [5]
   peaks([3]) ==> [3]
   peaks([]) ==> []
   ```

2. `is_cube(n)`
   Return True if the integer `n` a perfect cube and False otherwise? (Recall that a is a perfect cube if there is some integer b such that $b^3 = a$.)Do not use Python's root-finding capabilities.

   ```
   is_cube(0) ==> True
   is_cube(1) ==> True
   is_cube(2) ==> False
   is_cube(8) ==> True
   is_cube(-8) ==> True
   ```

3. `first_cube_above(n)`
   Return the smallest cube which exceeds the non-negative integer `n`. Do not use Python's exponentiation or root-finding capabilities.

   ```
   first_cube_above(7) ==> 8
   first_cube_above(8) ==> 27
   ```