Subtraction program pseudocode

This program is based on the subtraction strategies in chapter 8 of *Hard Math For Elementary School* by Glenn Ellison (2013).

This program cannot handle subtractions greater than 9,999.

Instructions:

* Import modules ✅
* Create a subtract function that takes two numbers (taken from the Entry boxes):
  + If any of the numbers is greater than 9,999, then tell the user one or both of the numbers is too big. ✅
  + If any of the numbers is negative, then tell the user one or both of the numbers is negative. ✅
  + If the bottom number is greater than the top number, then flip the numbers and place a minus sign in front of the answer. ✅
  + Convert both numbers to lists[[1]](#footnote-1) ✅
  + Reverse the lists using [::-1] ✅
  + Display the thousands, hundreds, tens, and ones on the screen. ✅
  + Repeat the following for each item in the lists (use range(len(ls) to iterate over the numbers in the list):
    - Start by subtracting the bottom number from the top one
    - If the answer is negative and the next element in the top list is not a 0, then subtract one from the next element and add 10 to the current element
    - If the answer is negative and the next element in the top list is a 0:
      * Iterate over the top list starting at the next element until a non-0 digit is found. Replace the 0s with 9s.
      * When a non-0 digit is found, subtract 1 from it.
      * Now you can borrow.
    - Display the number on the screen and append it to the results list
    - Add a short delay
* Create a root
* Create 2 labels to enter the numbers
* Create a solve button that calls the subtract function
* Create columns marked “Hundreds”, “Tens”, and “Ones” separated by ttk.Separators.
* Add labels for the hundreds

1. Because the list() function cannot take an integer as an argument, the first step is to convert the integer to a string using str(), and then add 0s to make the string four characters long with zfill(4). [↑](#footnote-ref-1)