Breakpoint function detection flow

Example: someone want to use the V-slope method and see VT1

1. Determine RC
   1. V-slope method implies using the VE vs. VCO2 plot to find RC
      1. Set x\_rc to “vco2”
      2. Set y\_rc to “ve”
   2. Fit a simple linear regression to the ve vs. vco2 curve
   3. Iteratively fit a piecewise regression of the ve vs. vco2 curve using the V-slope algorithm
      1. While fitting piecewise regressions, perform and F test against the single regression line
      2. IF there is a significant F test, calculate and store the % change in slope in the piecewise regression
         1. For all the significant F tests, choose the one that has the highest % change in slope from the left to the right regression lines
         2. Solve for the location of the intersection point between the two lines
         3. Create a new data frame for solving for VT1 truncated at RC
      3. ELSE use the entire data frame to solve for VT1
      4. Return RC data
2. Determine AT
   1. V-slope method implies using the VCO2 vs. VO2 plot to find VT1
      1. Set x\_at to “vo2”
      2. Set y\_at to “vco2”
   2. Fit a simple linear regression to the ve vs. vco2 curve
   3. Iteratively fit a piecewise regression of the ve vs. vco2 curve using the V-slope algorithm
      1. Check the supposed best point that
         1. The slope of the first regression line is > 0.6 (allow users to change this?)
         2. The change in slope from two regression lines > 0.1 (allow users to change this?)
      2. IF those checks are not satisfied, try the next best point
      3. IF checks aren’t satisfied, return “indeterminate”
      4. ELSE return AT data