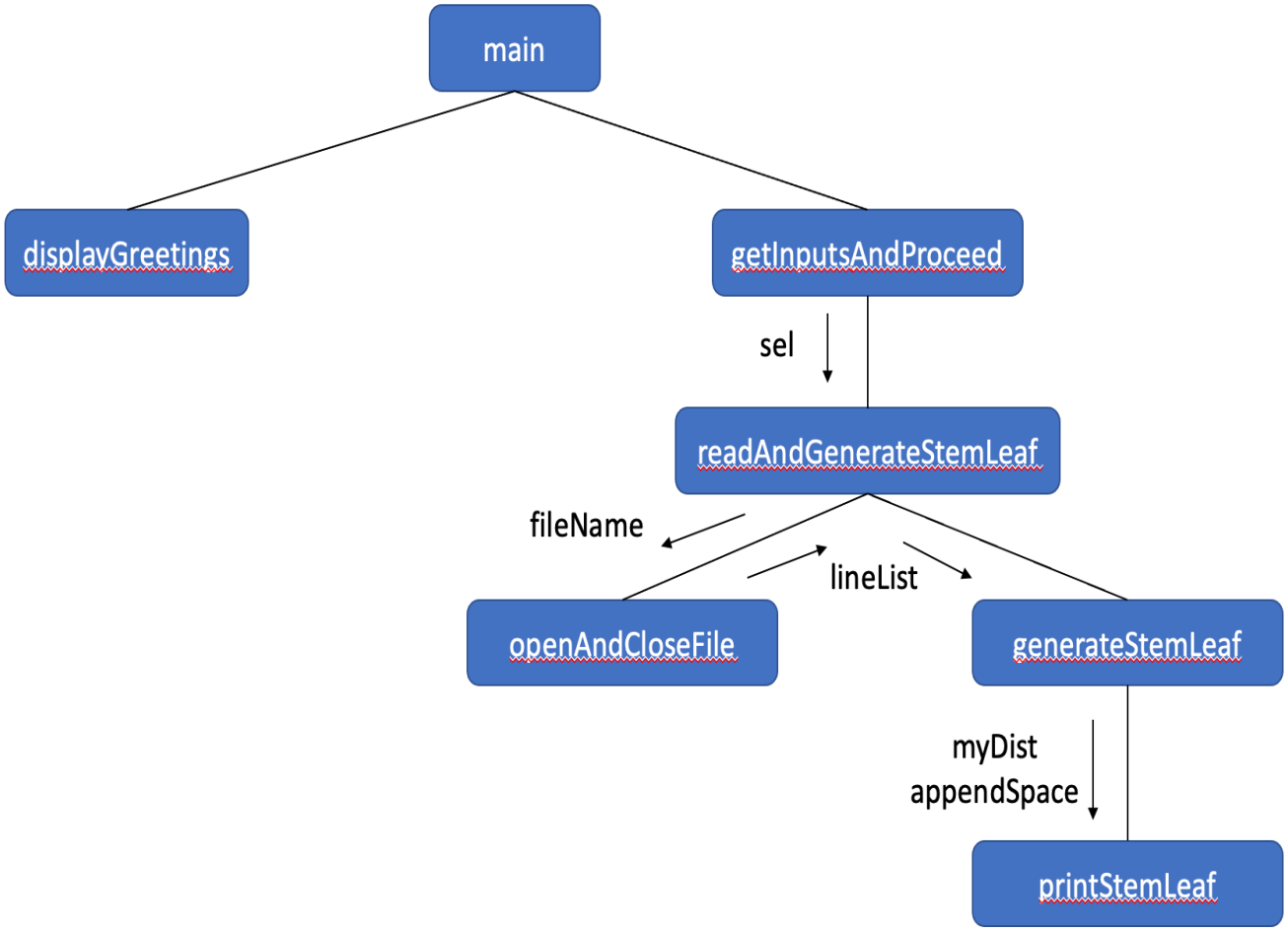
JITEN MISHRA DSC430_Assignment0201_StemAndLeafDesign

I have not given or received any unauthorized assistance on this assignment.

Top-Down Chart for Stem and Leaf Design



Important steps in displaying a stem and leaf plot w.r.t program

- Get valid input from user.
- Read the data in proper format required.
- Identify the stem and leaf of the data in an iterative manner.
- Create a proper data structure to store the stem and leaf data
- Know the lengthiest number to append space for proper formatting.
- Traverse thorough the data structure and print the stem, print a pipe and then print the list of leaf's.

This program is a 4 level design

- Level 0 - main()
- Level 1 - displayGreetings() and getInputsAndProceed()
- Level 2 - readAndGenerateStemLeaf(sel)
- Level 3 - openAndCloseFile(fileName) and generateStemLeaf(lineList)
- Level 4 - printStemLeaf(myDist, appendSpace)

Explanation of logic to be used in generateStemLeaf() from level 3 which consists the concept of creating the data structure of steam and leaf design

Input Parameter: <lineList> , list of data read from the file

Step 1: Create a dictionary myDist{} to hold the stem and leaf data

Step 2: Initialize a counter parameter appendSpace for formatting output.

Step3: Traverse through the list <lineList> from range 0, length of lineList in a for loop

i) Extract the first string by stripping unwanted space and convert it to integer <x> for further computing.

ii) Get the stem value <stem> with string functionality from range 0,-1 and convert it to integer, this basically takes all the digits except the last one.

iii) Get the leaf value <leaf> using modulus of 10 from <x>, this basically is the last digit of the <x>.

iv) After extracting the stem and leaf checks if the stem is in the dictionary <myDist> then perform the below steps

   a) Get the list of leaf from dictionary of the corresponding stem
   b) Append the new leaf value to the existing list retrieved above
   c) Override the list with the appended list having the leaf's and assign to the value pair of the dictionary

v) If the stem is not present in the dictionary, then perform the below steps

   a) Create a new list <newLeafList> to be added to the value pair the new stem
   b) Append the new leaf value to the new list created in the above step.
   c) Now add the new node of stem and leaf value pair to the dictionary

vi) Now the appendSpace which was initialized at the beginning is to be checked with the length of the stem value and if the value of the appendSpace is less then update the appendSpace with the length of the stem value. < **This step is to calculate how many space are to be appended to the left of the stem value for proper formatting so that if the input has multi digit data the code should be able to format print the steam and leaf design without any problem**>

Step 4: Call the printStemLeaf in the execution flow to print the output by passing the myDist dictionary created above and the appendSpace value for formatting.

Sample Output:

```
 1 | 8
 2 | 8 8
 3 | 2 9 9
 4 | 2 3 5 6 7 8
 5 | 0 2 2 3 3 3 3 4 4 4 5 5 5 5 5 7 7 9 9
 6 | 2 5 5 6 6 6 7
 7 | 2 2 2 3 4 5 5 5 7
 8 | 5 6
10 | 1
11 | 1 9 9
12 | 1 3 3 4 5 5 6 7 8
13 | 1 1 2 3 5 5 5 7 7 7
14 | 0 1 1 2 2 3 3 4 5 6 6 7 9
15 | 0 2 3 5 5 6 7 8 8
16 | 0 2 4 4 9
17 | 2
```