ASSIGNMENT #15- FINAL PROGRAMMING PROJECT: DEMONTRATION OF AN UNDERSTANDING OF FLOWGORITHM & PYTHON (WORTH 80 POINTS)

DUE, MAY 10, 2022 at 11:59 p.m.

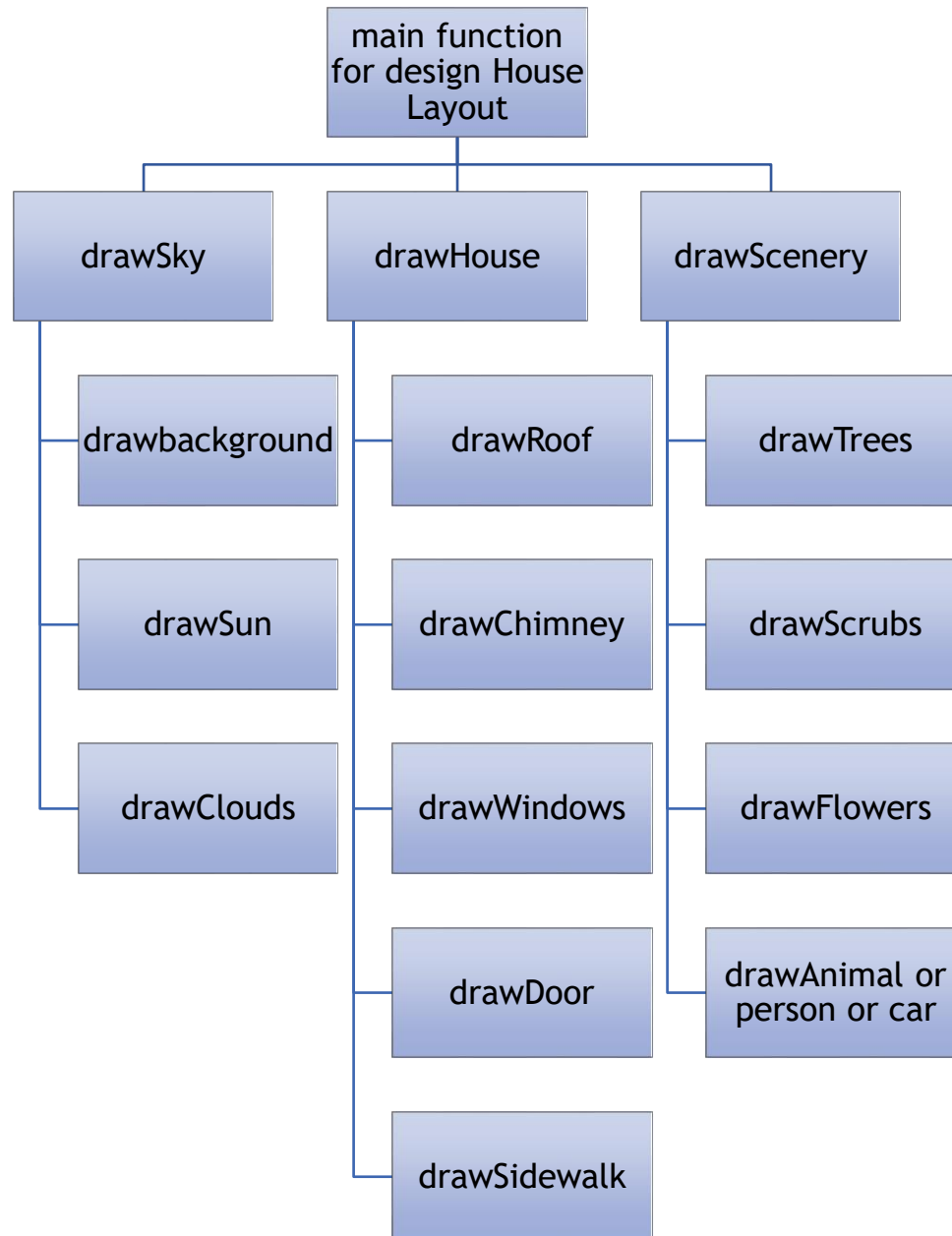The final project for COP1000 is an individual project. **Do your own work**.

SEE HANDOUT: "PREPARING FOR THE FINAL PROJECT" Located under the CONTENT LINK FOR WEEK #16

PART I: CREATING OR REVISING A TURTLE GRAPHICS DESIGN – ORGANIZING INTO FUNCTIONS. Do one of the following: (WORTH 35 POINTS)

VERSION #1:

Revise the House Design from Assignment #07 and organize into the following functions:

See HOUSE HIPO DESIGN: EACH RECTANGE REPRESENTS A DIFFERENT FUNCTION OR TASK

main function for design House Layout

- drawSky
  - drawbackground
  - drawSun
  - drawClouds
- drawHouse
  - drawRoof
  - drawChimney
  - drawWindows
  - drawDoor
  - drawSidewalk
- drawScenery
  - drawTrees
  - drawScrubs
  - drawFlowers
  - drawAnimal or person or car

FUNCTIONS TO CREATE FOR HOUSE: (worth 35 points)

1. ☐ create the main function that will be used to call all the functions. (Worth 5 points)
2. ☐ You may have more or less functions as in the design. However, there must be at least 5 functions excluding the main function (20 points)
3. ☐ The functions may be stored inside the same program as the source code or as a separate program and import them.
4. ☐ There must be at least 5 functions created in the project
5. ☐ Following the HIPO chart here are the following functions:
   a. ☐ Main House function
   b. ☐ drawSky
      i. ☐ drawBackground
      ii. ☐ drawSun
      iii. ☐ drawClouds
   c. ☐ drawHouse
      i. ☐ drawRoof
      ii. ☐ drawChimney
      iii. ☐ drawWindows
      iv. ☐ drawDoor
      v. ☐ drawSidewalk
   d. ☐ drawScenery
      i. ☐ drawTrees
      ii. ☐ drawScrubs
      iii. ☐ drawFlowers
      iv. ☐ drawAnimal, or person or car

COMMENTS/SIGNIFICANT – for Part 1-Version #1

6. ☐ There must be the following comments:
   a. ☐ Intro comments with **(worth 2 points)**
      i. ☐ your name,
      ii. ☐ name of assignment,

     iii. ☐ date written,

     iv. ☐ purpose

  b. ☐ Intro and ending comments to describe every major task per function (worth 4 points)

  c. ☐ Comments for each called function (worth 3 points)

  d. ☐ Comments ending comments (worth 1 point)
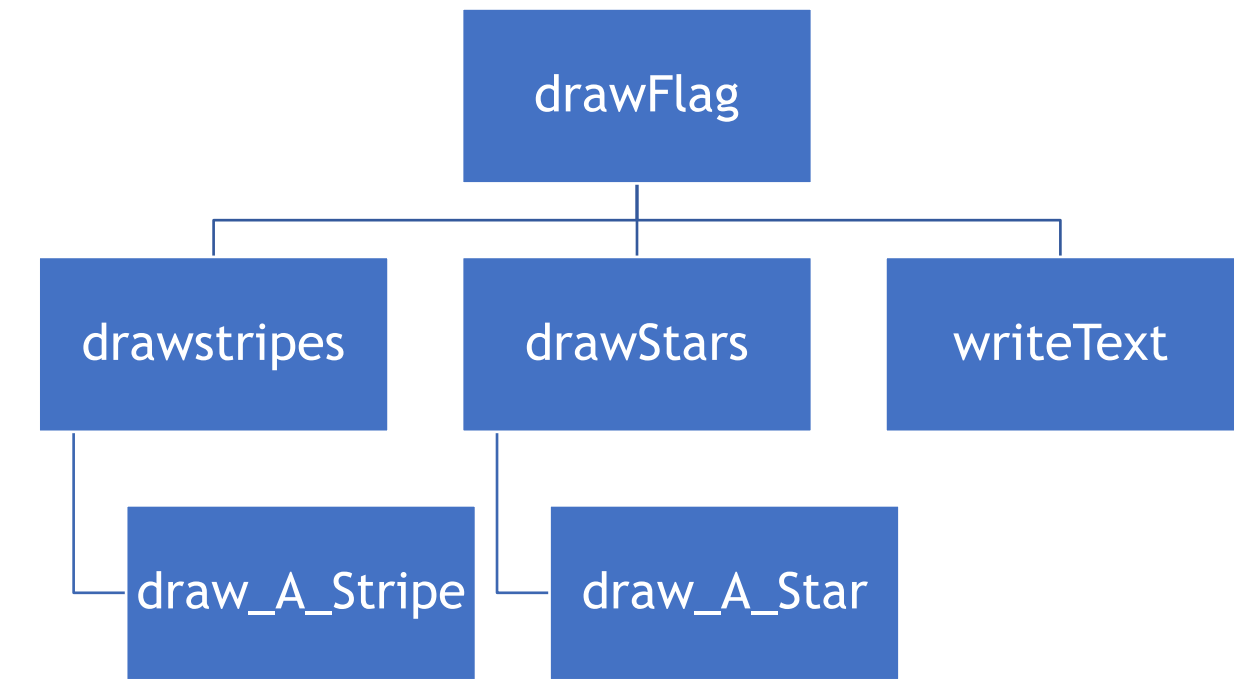

RESAVE THE DESIGN FOR VERSION #1 AS:

lastname_firstname_A15_HOUSE_DESIGN_FUNCTIONS.py

lastname_firstname_A15_HOUSE_DESIGN_IMAGE

OR DO

VERSION #02 (Worth 35 points) including required comments as in Part 1- Version #1

See FLAG (USA OR ANY OTHER COUNTRY) HIPO DESIGN: EACH RECTANGE REPRESENTS A DIFFERENT FUNCTION OR TASK


```
                        drawFlag
          ┌────────────────┼────────────────┐
      drawstripes      drawStars         writeText
          │                │
      draw_A_Stripe    draw_A_Star
```

You may divide the steps into more functions than the illustration.

There need to be at least 4 functions to perform tasks and the main functions.

1. ☐ Function to draw the stripes
   a. ☐ draw a stripe
2. ☐ Function to draw the stars
   a. ☐ Function to draw a star
3. ☐ draw text to identify the flag

SAVE THE DESIGN FOR VERSION #2 AS:

lastname_firstname_A15_FLAG_DESIGN_FUNCTIONS.py

lastname_firstname_A15_FLAG_DESIGN_IMAGE

PART 2 VERSION:1– CREATING LISTS AND FUNCTIONS (worth 45 points) – See HIPO CHART down a few pages…

REVISE ASSIGNMENT #12 and save as:

RESAVE PROGRAM AS:

lastname_firstname_A15_RAINFALL_FINAL_project.py

To do the following:

1. ☐ Use the data by keying via the keyboard or you may Create a function to Read data from a file called

   rainfallData.txt

2. ☐ Create a function to use an exception to check to make sure the file exists (worth 4 points)

3. ☐ The data should still be stored inside a list
4. ☐ Check to make sure the data read is correct (data type and not a negative value)

ADD TO myCustomFunctions.py and import inside the program as was done in Assignment #12 (worth 4 points)

5. ☐ Add a new function to write a list of rainfalls and count the number of rainfalls <= 10 inches (worth 4 points)
6. ☐ Add a new function to write a list of rainfalls and count the number of rainfalls > 10 inches and less than or equal to 32 inches (worth 4 points)
7. ☐ Add a new function to write a list of rainfalls and count the number of rainfalls > 32 inches and less than 52 inches (worth 4 points)
8. ☐ The program still needs to write the following (worth 8 points)
   a. ☐ Unsorted List of rainfalls
   b. ☐ Statistics such as minimum, maximum average/mean RAINFALL
   c. ☐ Sorted list of rainfalls
   d. ☐ Statistics such as minimum, maximum average/mean RAINFALL
   e. ☐ Rainfalls greater than or equal to 52
   f. ☐ (FUNCTION) Add report of rainfalls <= 10 inches
   g. ☐ (FUNCTION) Add report of rainfalls > 10 inches and <= 32 inches
   h. ☐ (FUNCTION) Add report of rainfalls > 32 inches and less than 52 inches.

COMMENTS/SIGNIFICANT – for Part 2

1. ☐ There must be the following comments:
    a. ☐ Intro comments with **(worth 2 points)**
        i. ☐ your name,
        ii. ☐ name of assignment,
        iii. ☐ date written,
        iv. ☐ purpose
    b. ☐ Intro and ending comments to describe every major task per function (worth 4 points)
    c. ☐ Comments for each called function (worth 3 points)
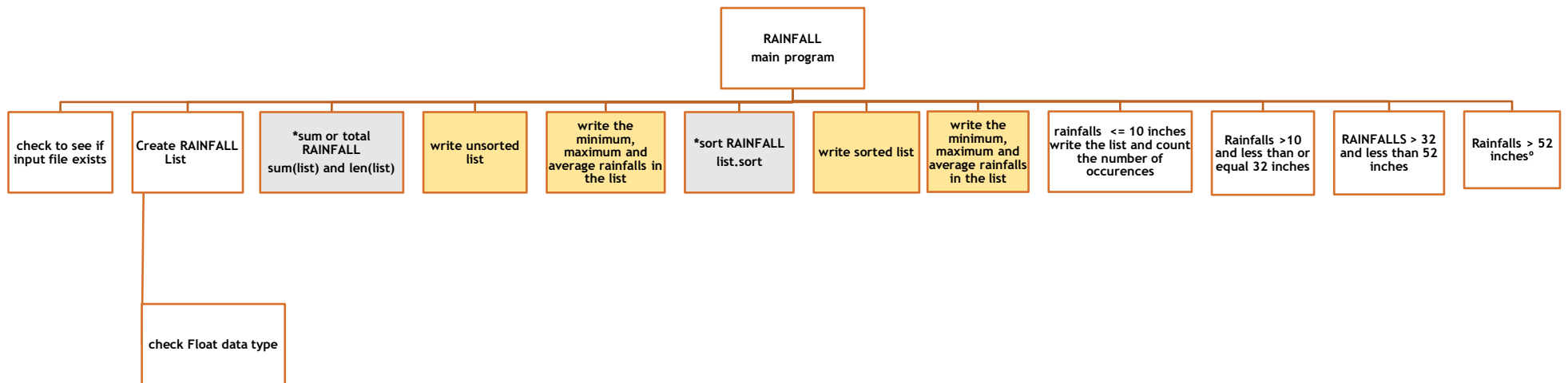   d. ☐ Comments ending comments (worth 1 point)

RESAVE PROGRAM AS:

lastname_firstname_A15_RAINFALL_FINAL_project.py

to import the functions from the new file called myCustomFunctions.py

REVISED HIPO CHART FOR RAINFALL REVISION

blue color indicates function is called multiple times

light gray color indicates you are to use the built-in functions

RAINFALL main program

- check to see if input file exists
- Create RAINFALL List
  - check Float data type
- *sum or total RAINFALL sum(list) and len(list)
- write unsorted list
- write the minimum, maximum and average rainfalls in the list
- *sort RAINFALL list.sort
- write sorted list
- write the minimum, maximum and average rainfalls in the list
- rainfalls <= 10 inches write the list and count the number of occurences
- Rainfalls >10 and less than or equal 32 inches
- RAINFALLS > 32 and less than 52 inches
- Rainfalls > 52 inches°

PART 2 - VERSION:2 -

NUMBER ANALYSIS PROGRAM

DESIGN A PROGRAM THAT WILL DO THE FOLLOWING:

1. ☐ Create a function that checks to see if the numbers.txt file exist before reading the data
2. ☐ Create a function that checks the data inside a list/array called numList
3. ☐ Create a function that writes the list "unsorted" with heading. Be sure to Center the heading and values
4. ☐ Create a function to calculate the average / mean of the list of numbers
5. ☐ Create a function to write the statistics (minimum, maximum, mean or average
6. ☐ Use built-in sort function to sort the list
7. ☐ Write the heading for the sorted list and call the function to write the list again
8. ☐ Call the function to write the statistics (minimum, maximum, mean or average; use the built-in functions min, max.
    a. You may import statistics i.e. from statistics import *   for the mean function which works similar to calculating the average
9. ☐ Create a function to find and write all values less than or equal to 69.99
10.   ☐ Create a function to find and write all values between 70 -94.99; Count the number of occurrences and write it as in Assignment #12
11. ☐ Create a function to find and write all values between 95-110; Count the number of occurrences and write it as in Assignment #12
12. ☐ Create a function to find and write all values greater than 110; Count the number of occurrences and write it as in Assignment #12

SAVE OR USE THE FOLLOWING FILES:

numbers.txt

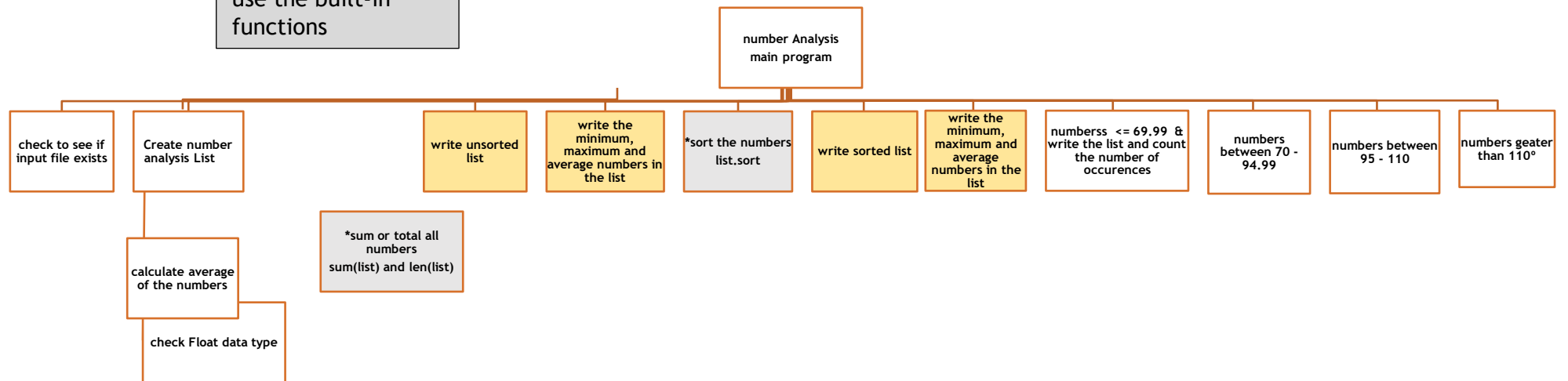**lastname_firstname_A15_NUMBER_ANALYSIS_FINAL_project.py**

lastname_firstname_A15_NUMBER_ANALYSIS_output.txt

myCustomFunctions.py

THE HIPO CHART FOR NUMBER ANALYSIS FOLLOWS ON THE NEXT PAGE

yellow/gold color indicates function is called multiple

light gray color indicates you are to use the built-in functions

number Analysis main program

check to see if input file exists

Create number analysis List

write unsorted list

write the minimum, maximum and average numbers in the list

*sort the numbers list.sort

write sorted list

write the minimum, maximum and average numbers in the list

numberss <= 69.99 & write the list and count the number of occurences

numbers between 70 - 94.99

numbers between 95 - 110

numbers geater than 110°

calculate average of the numbers

check Float data type

*sum or total all numbers
sum(list) and len(list)

SUBMIT THE FOLLOWING INSIDE THE DROP BOX FOR THE FINAL PROJECT:

Depending on the version you did, you will have at least 6 files to submit

You may have a combination of Part #1 Version 1, Part 2, version 2 etc.

There must be a Part 1 and part 2 of one of the versions

VERSION #1

(make sure the files are correctly named) Worth 2 points)

rainfallData.txt

lastname_firstname_A15_RAINFALL_FINAL_project.py

myCustomFunctions.py

lastname_firstname_A15_HOUSE_DESIGN_FUNCTIONS.py

lastname_firstname_A15_HOUSE_DESIGN_IMAGE

VERSION #2

numbers.txt

lastname_firstname_A15_NUMBER_ANALYSIS_FINAL_project.py

lastname_firstname_A15_NUMBER_ANALYSIS_output.txt (output will be similar to the layout in Assignment #12)

myCustomFunctions.py

lastname_firstname_A15_FLAG_DESIGN_FUNCTIONS.py

lastname_firstname_A15_FLAG_DESIGN_IMAGE