CSE 1284 Neighborhood Exercise
Fall 2018

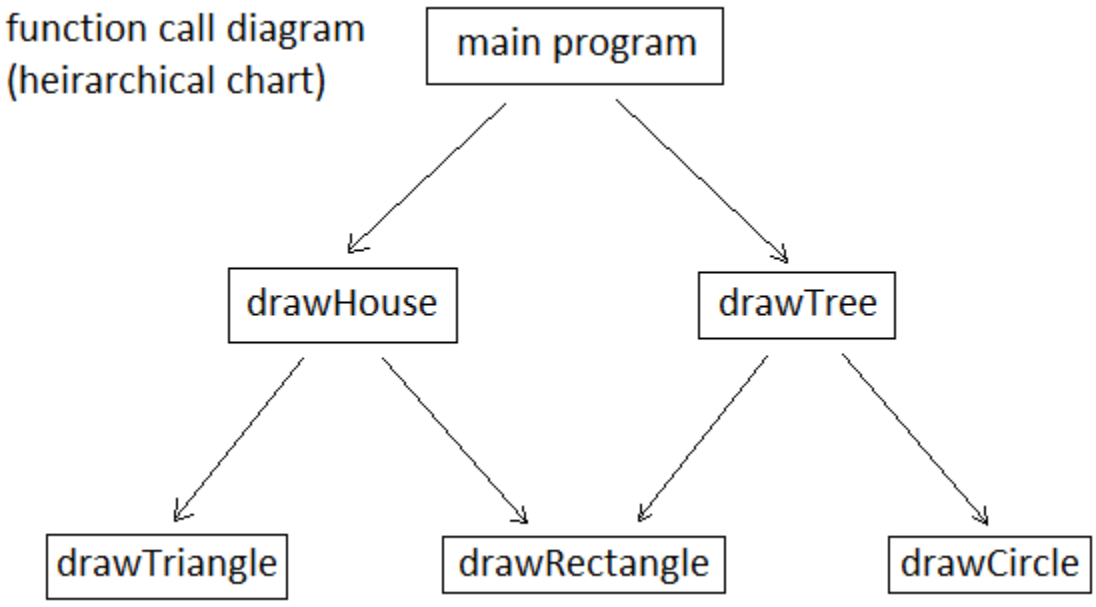
Objectives

- Learn about top down design
- Practice writing functions
- Have fun and be creative

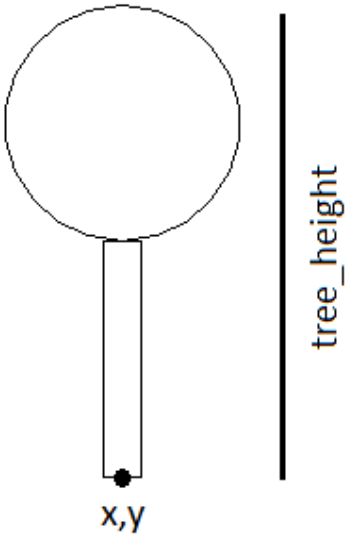
Problem Statement

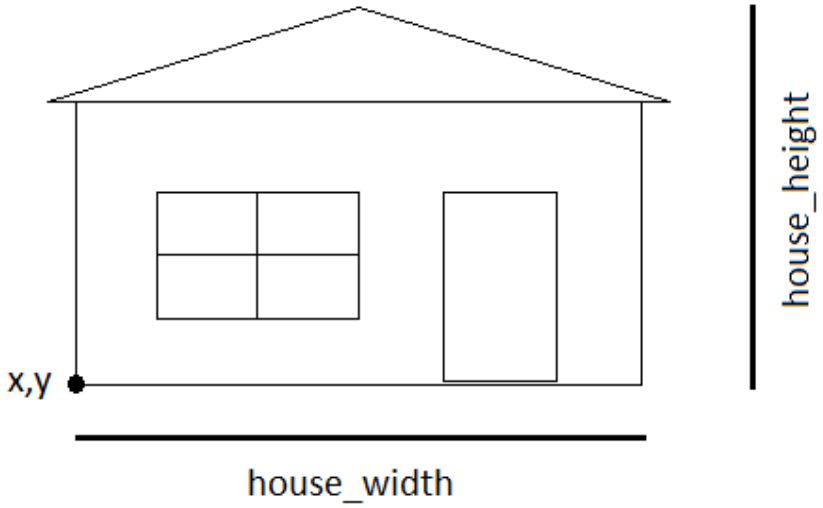
Draw a neighborhood full of houses and trees. When you want to draw several houses, wouldn't it be nice to have a function that draws one house? You could just call it several times. You would want to specify where the house should be, its dimensions and maybe its color. Same goes for trees, just say where you want the tree and how tall it should be, then call a function that draws a tree. Both houses and trees can be drawn using basic shapes such as rectangles, triangles and circles. Wouldn't it be handy to have some low level functions to draw basic shapes?

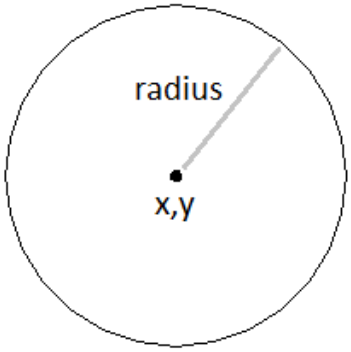
We just did some top down design! That's breaking a complex problem, draw a neighborhood, into simpler problems, draw a house, draw a tree, then breaking those down into even simpler problems, draw some basic shapes. Once we have a list of problems or tasks, we can decide to write some functions to perform those tasks. The function call diagram below shows the calling relationship between our functions. To be completely accurate and match the neighborhood picture above, we should also have arrows from the main program to drawCircle (draw the sun) and drawTriangle (draw the pine trees).

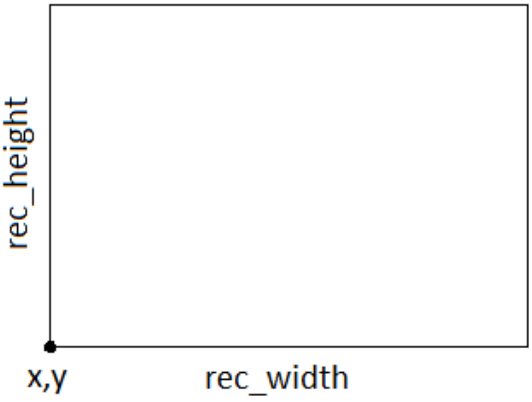


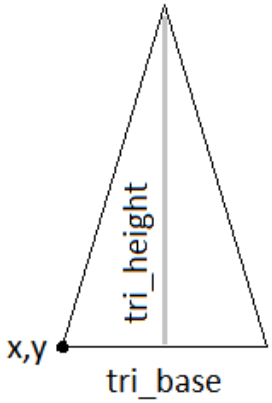
Now that we know the tasks or functions needed, we should decide what parameters and return values our functions need. Our drawing functions don't need to return anything, they just draw. However, they do need some parameters to tell them where to draw and how large to draw. The diagrams below illustrate the parameters you are required to have. You may decide to have house height mean something different, such as from the ground to the top of the walls but not to the top of the roof. Maybe you want your house x,y to be the middle of the bottom, not the lower left corner. That is fine, but you must have at least those parameters. You may also add some optional parameters such as color, fill, etc.



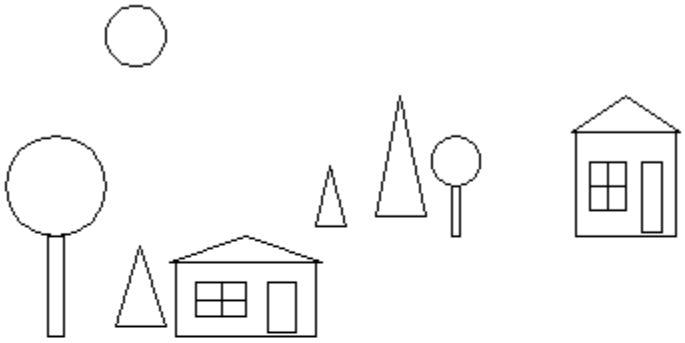








Pumpkins are optional but fun and tasty! How do you draw a curved pumpkin mouth? Draw a filled black circle, then draw a somewhat larger filled white circle somewhat above the black circle. You can also draw people, cars, or something else made of basic shapes.



Deliverables

Create a PDF file with a screenshot of your neighborhood. It must have at least two houses and at least two trees. Copy and paste your code into your PDF. Also, turn in your code file in case the grader wants to run it.

ex_neighborhood_NETID.pdf - screenshot and code copy/pasted
ex_neighborhood_NETID.py - code file

Grading

5 pts possible, or 6 with extra credit!

Must have screenshot in PDF, code in PDF, and turn in code *.py file to get points.

+1 rectangle function with all required parameters

+1 triangle function with all required parameters

+1 circle function with all required parameters

+1 tree function with all required parameters

+1 house function with all required parameters

+1 EXTRA CREDIT color/fill parameters and/or pumpkin/car/person function(s)