Name _____

CPADS Lab Activity #1

Possible instructions

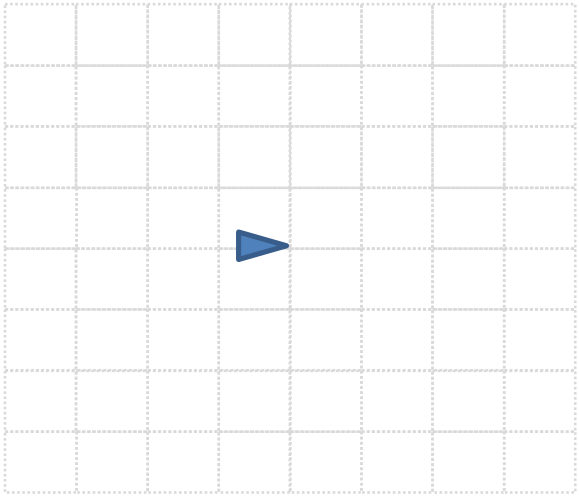
pu(): Pen Up – does not draw while moving
pd(): Pen Down – will draw when moving
fd(x): Forward – move forward ***x*** units ('-' moves backwards)
rt(x): Right turn – turn right ***x*** # of degrees (no movement or drawing)
lt(x): Left turn – turn left ***x*** # of degrees (no movement or drawing)

Examples:

To move forward 1 unit: **fd(1)**
To move backward 2 units: **fd(-2)**
To turn right 60 degrees: **rt(60)**

1. Draw the output of the following code. Number the line segments in the order they are drawn and indicate the final position and orientation of the cursor.

pu( )
fd(-1)
rt(90)
fd(1)
lt(90)
pd( )
fd(2)
lt(90)
fd(2)
lt(90)
fd(2)
lt(90)
fd(2)
lt(90)
pu( )
fd(1)
lt(90)
fd(1)
rt(90)



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2. Create a **drawSquareFromCenter(x)** instruction that draws a square with sides of length ***x*** *centered* about the cursor's position. The cursor must be repositioned back to its starting location. Note: You may **NOT** assume that the pen is down when the function is called and you must pick the pen up at the end of the function.

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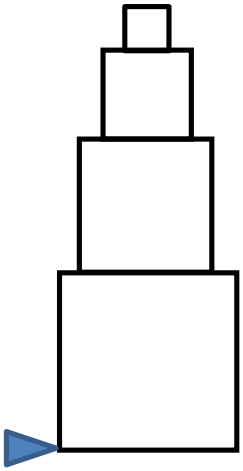
3. Write a sequence of instructions using **drawSquareFromCenter(x)** to construct the following layer cake figure given to you to celebrate your success on problems 1 and 2! The layers are sizes 1, 2, 3, and 4 and centered on each other. You do not need to worry about where the cursor ends up once the figure is drawn.

   Hint: Consider how the cursor must move in between drawing each layer.



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4. *Challenge!* Assume you are given a **drawSquareFromCenter(x)** instruction as specified in problem 2. Write a sequence of instructions to construct the following figure (assume the squares are sizes 1, 2, 3, 4)

   - **THINK ABOUT AND PLAN a strategy for tackling this problem BEFORE trying to write any instructions.**
   - Check your work by showing on the figure the location and orientation of the cursor immediately before calling each **drawSquare(x)** instruction.
   - Number each square in the order they are drawn.
   - If you move the cursor without drawing, i.e. after a **pu()** command, draw a curved arrow from the starting to the ending location of the movement. Be sure to indicate the final orientation of the cursor following the move.
   - After you have drawn the figure, make sure to return the cursor to its original location and in its original orientation.