

## For Loop Practice

1. Using a for loop, write a function that computes the factorial of a number. Reminder: factorial is  $n!$  or  $(1*2*3*...*n)$ . Get  $n$  as input from the user and assume it is a positive integer.

### Examples:

`factorial(5)` returns 120                     $\#(1*2*3*4*5)$

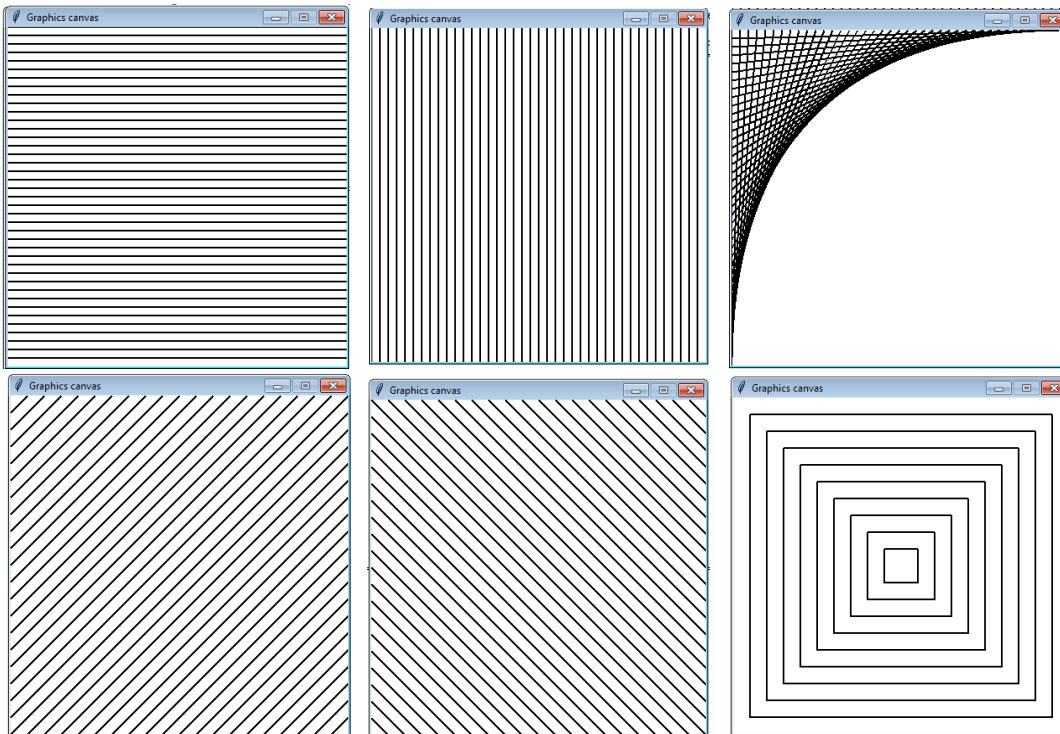
`factorial(8)` returns 40320  $\#(1*2*3*4*5*6*7*8)$

2. Using a for loop, write a function with no parameters that simulates flipping a coin 1000 times, and displays the number of heads and tails.

-You'll need to use the random number generation function we learned

`number = random.randint(lowest, highest)`

3. Try using the simple graphics library to produce the following designs or pictures. Each picture represents a design completely covering a square canvas (you can pick the size of the canvas).



You can also try drawing the 3<sup>rd</sup> image with the design in the other three corners.

Challenge: draw a spiral. If you need sine/cosine, put "import math" at the top of your program, and then you will have access to the functions `math.sin` and `math.cos`.

## While Loop Practice

1. Write a program that starts off asking the user how much money they have in their bank account. Then enter a loop that continuously asks the user to enter an amount of money to withdraw from an ATM. Keep looping until the account is empty.

Next, add a menu to let the user add money, subtract money, or quit the ATM program. Let the user keep using the ATM as long as they want (until they choose to quit). Prevent the user from withdrawing more money than they have in their account.

2. Write a function called `count_factors` that takes in a single parameter called `num`. This function returns the number of positive factors of `num`; this is the number of positive integers between 1 and `num`, inclusive, that divide into `num` evenly. For instance, the number 10 has 4 factors: 1, 2, 5, and 10. So calling `count_factors(10)` should return 4.

Do this by writing a loop that counts from 1 to `num` and tests the remainder of dividing `num` by whatever the counter variable is.