1 Warmup exercises

- Submit one file `FIRSTNAME_LASTNAME_warmup.py` for this assignment.
- These exercises are tiny problems which will help you to revise the syntax.
- Make sure there are no syntax errors in your file.

Questions

1. Write a function `am_gm_hm(x,y)` that takes as input two numbers and returns the Arithmetic Mean, Geometric Mean and Harmonic mean of the two - in that order. What happens if one of the numbers is 0?
2. Triangle inequality states that for the sum of any two sides of a triangle is greater than the third side. Write a function `check_triangle_inequality(a,b,c)` that returns False if some combination of sides violates the triangle inequality (Hint: there are 3 scenarios) and True otherwise.
3. You already know how to calculate factorials from the lecture. Use that function (or better write it again yourself) to compute the value of sin(x) according to the Taylor formula upto k terms. Thus your function should be `calculate_sin(x,k)` . The Taylor formula for sin(x) is as follows-

   > sin(x) = x - x^3/3! + x^5/5! - x^7/7! + x^9/9! ....

4. Write a function `check_substring(string1,string2)` to check if `string2` is a substring of `string1` . For example "chem" is a substring of "alchemy" and "chemistry". It returns True or False.
5. Write a function to generate all substrings of a string and return it as a list of strings. Let the function be called `generate_substrings(string)` . For example, `generate_substrings("alchemy")` returns `["a","al","alc","alch","alche","alchem","alchemy","l","lc",... etc]` . There should be no repititions in the list.
6. Write a function `greet_me()` to take your name as input from the command line and print a personalized greeting like "Hello, Rani, how are you today?"
7. Write a function `mean_calculator()` to take two floats as input from command line and print the AM,GM,HM of those numbers.
8. Write a function to print only odd numbers in the range(a,b). Write it two times - once with a for loop (`print_odd_for(a,b)`) and once with a while loop (`print_odd_while(a,b)`).
9. Write a function that uses recursion to calculate the nth term of the Fibonacci series called `fibonacci(n)` . (Google fibonacci series if you don't know it.)
10. Write a function that uses a loop to **print** the Fibonacci series upto n terms called `fibonacci_loop(n)` .
11. Write a function `sum_game(value)` that runs a loop that takes numbers as input from command line, and exits only when the sum of the numbers so far reaches `value` . Make sure value is positive, but the numbers which come from command line can be negative.
12. Write a function `list_overlap(list1,list2)` that takes two lists of integers as input, and returns a list of the common elements. Don't use sets for this.