

HW3: Data Types, Functions, Conditionals and Loops

Due: February 28th, 2024

1 Power of a Number

Write a function to compute the value of x raised to the power y without using the built-in `pow` or `**` operator.

2 Minimum and Maximum

Write a function that takes a list of numbers as input and returns the minimum and maximum values in the list as a tuple.

3 Check Leap Year

Write a function that takes a year as input and returns `True` if it's a leap year, and `False` otherwise. A leap year is divisible by 4 but not divisible by 100 unless it is also divisible by 400.

4 Calculate BMI (Body Mass Index)

Write a function that takes a person's weight (in kilograms) and height (in meters) as input and returns their BMI.

5 Rotating Digits

Implement a function called `rotate_digits` that takes an integer `n` as input and rotates its digits to the right by one position. For example, given the input 12345, the function should return 51234. You may *not* convert the input to a string but you can use properties of a string in your answer.

Hint: Use modulus (%) and floor division (/).

Ex: $12345 \% 10 = 5$ and $12345 // 10 = 1234$

6 Minimum and Maximum but with Loops

For both minimum and maximum, write one function to manually find that value using a for loop and another to manually find it using a while loop. You may not use `min()` or `max()`. In total you should have written 4 functions.

7 Vowels

Write a function which takes in a string and outputs the number of vowels. Consider only a,e,i,o,u to be vowels and do not forget about capital letters.

Ex: `vowel count("UC Berkeley")` will return 41

8 Digital Root

Write a function that takes in an integer and returns the sum of the digits (the digital root).

Ex: `digital root(12345)` will return 15