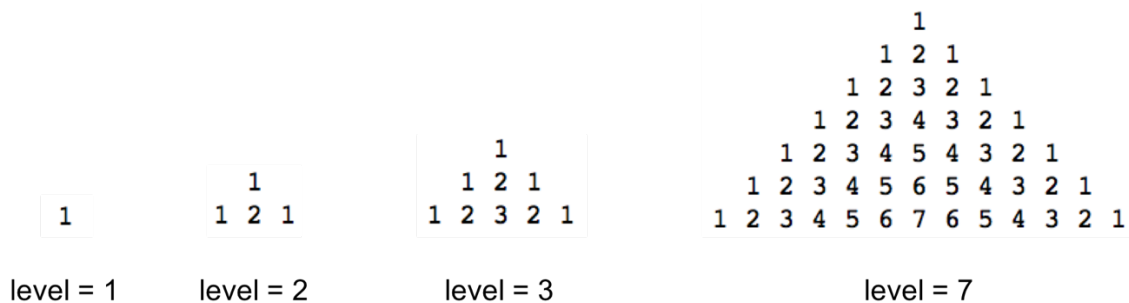


BIOS 6642 – Take-Home Assignment One

Due at 11:59PM (Mountain Time), Friday, March 5, 2021

Please submit your source codes (.py or .ipynb file) and screenshots of the output of your codes. Your codes should be properly documented or commented.

- Q1 (30%). Please write a Python program to draw the following patterns using *while* or *for* loops. The level of the pattern ($0 < \text{level} < 10$) is provided by the user during runtime. Some example patterns are shown as follows.



- Q2 (35%). A palindromic number is a number that remains the same when its digits are reversed (e.g., 2, 3, and 303), a prime number is a natural number greater than 1 that is not a product of two smaller natural numbers (e.g., 2, 3, and 17), and a palindromic prime is a prime number that is also a palindromic number. Some decimal palindromic primes are 2, 3, 5, 7, 11, 101, 131, 151, ...

More details about palindromic primes can be found at:

https://en.wikipedia.org/wiki/Palindromic_prime.

Please write one or more functions to find and print all the decimal palindromic prime numbers up to a given number, which is provided by the user during runtime. In addition to the function(s), please write some code to test the function(s).

- Q3 (35%). Please write a function that takes two positive integers as input parameters, $p1$ and $p2$. Assume $p1 \leq p2$. For any number, p , where $p1 \leq p \leq p2$, if p is divisible by each of its digits, print p . For example, if $p1 = 30$ and $p2 = 50$, then your function should print 33, 36, 44, 48, because

$$33 \% 3 = 0$$

$$36 \% 3 = 0 \text{ and } 36 \% 6 = 0$$

$$44 \% 4 = 0$$

$$48 \% 4 = 0 \text{ and } 48 \% 8 = 0$$

In addition to the function, please write some code to test the function.