Programming

For Loops Homework 1

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Problem #1: Find Special Pairs

- Count how many positive integers (X and Y) meet the following criteria:
  - X in the range [50-300]
  - Y in the range [70-400]
  - X < Y
  - (X+Y) divisible by 7
- Output
  - 8040

Problem #2: Find All Quadruples

- Count how many positive integers (a, b, c, d) are of the following properties:
  - 1 <= a, b, c, d <= 200
  - a + b = c + d
- Output:
  - 5333400
- Code it once using 4 nested loops (very slow!)
- Code it once using only 3 nested loops (same thinking line as lectures)
- When you learn data structures, you can do it using just nested loops!

Problem #3: Is it Prime?

- Read in a positive integer N (< 500), and print YES if it is prime, otherwise print NO
  - A prime number is greater than 1 AND cannot be formed by multiplying two smaller numbers.
    - In other words, number%whatever != 0
    - The first few prime numbers are 2, 3, 5, 7, 11, 13, 17, 19, 23, and 29.
- Example input ⇒ output
  - 13 ⇒ YES (only 1 * 13)
  - 12 ⇒ NO (e.g. 12 = 2 *6, so 12 can be divided by 2 or 6)

Problem #4: Print Primes

- Read in a positive integer N (< 500), then print all prime numbers <= N
  - The output should be separated by commas, as below
    - Don’t print a comma after the last number
- Example input ⇒ output
  - 18 ⇒ 2,3,5,7,11,13,17
    - Note how there is NO comma after the last number!

"Acquire knowledge and impart it to the people."

"Seek knowledge from the Cradle to the Grave."