DSC 430: Python Programming
Assignment 0401: Goldbach Deuce

Given a list of ***length*** integers, do any two of them sum to ***sum***? You solved this problem in last week's Goldbach's Conjecture assignment. However, I bet your running time was $O(n^2)$. If not, great! This assignment will be a snap. For the rest of you…

Ask the user for ***length*** and ***sum***. Create a list of ***length*** random numbers between 0 and 100. Determine if two of the numbers sum to ***sum*** in O(n.log(n)). Output the appropriate results.

Hint: Binary Search.

Warning: look-ups in dictionaries and lists are not free.

Concession: I will let you sort the list using Python's built in function as a preprocessing step, not counted toward the efficiency of your algorithm. Besides, merge sort runs in O(n.log(n)).

Record a three minute video in which you run the code. Then, present your code. Specifically, answer the following questions:

- Explain how your approach works.
- Explain why your code runs in O(n.log(n)).

Submission: Submit a single .py file containing all the code to the D2L. Do not zip or archive the file. Your code must include comments at the top including your name, date, video link, and the honor statement, "I have not given or received any unauthorized assistance on this assignment." Each function must include a docstring and be commented appropriately.