**Homework 2**

**Logistics**

* Due date: Thursday, September 26th, no later than 11:59 p.m.
* Submission instructions: upload your solution, entitled YourFirstName-YourLastName-Program2.py, to the Blackboard Homework 2 Dropbox.
* Deadline Reminder: If you cannot fully complete the assignment, submit whatever you have before the deadline so that partial credit can be earned.

**Learning Outcomes**

* To solve this problem, you need to understand the following Python concepts: data types, conditional statements, functions, and iteration.

**Background Information**

In the file YourFirstName-YourLastName-Program2.py, you have a function rollDice(), which returns a list of 5 random ints between 1 and 6, inclusive.

Write a program with the following:

3a) A function isFiveKind(dice: list) -> bool that returns True if all five dice are the same value and False otherwise. (10 points)

3b) A function isFourKind(dice: list) -> bool that returns True if four dice are the same value and False otherwise. (10 points)

3c) A function isFullHouse(dice: list) -> bool that returns True if three dice are the same value AND two dice are the same value and False otherwise. (10 points)

3d) A function isStraight(dice: list) -> bool that returns True if all five dice can be ordered such that they are consecutively ascending and False otherwise. (10 points)

3e) A function isThreeKind(dice: list) -> bool that returns True if three dice are the same value and False otherwise. (10 points)

3f) A function isTwoPair(dice: list) -> bool that returns True if there are two values that each appear twice and False otherwise. (10 points)

3g) A function isPair(dice: list) -> bool that returns True if two dice are the same value and False otherwise. (10 points)

3h) A function playDicePoker(numRolls: int) -> dict that rolls the dice numRolls amount of times and computes the number of fiveKind, fourKind, fullHouse, straight, threeKind, twoPair, pair and bust (i.e. none of the above), earned in that number of rolls. Return a dictionary with keys for the type of roll and values for that roll's count (i.e. after zero rolls, the dictionary is handsWon = {"fiveKind" : 0, "fourKind" : 0, "fullHouse" : 0, "straight" : 0, "threeKind" : 0, "twoPair" : 0, "pair" : 0, "bust" : 0}). NOTE: Each roll should only be counted once. That is to say a fullHouse is a just a fullHouse, and not also a threeKind and pair. This means the sum of all entries in the dictionary should total to numRolls. (15 points)

3i) A function printResults(numRolls: int, handsWon: dict) -> None that prints the total number of rolls, the total number of each type of roll, and the percentage observed of each type of roll. (15 points)

*HINT: If you enter a very large numRolls into the console (like >10,000), then, by the law of large numbers, you should see probabilities that very closely match the probability distribution published on the*[*Dice Poker Wikipedia*](https://en.wikipedia.org/wiki/Poker_dice)*.*

3j) Finally, write a script/main function that prompts the user how many times they'd like to play dice poker, passes the user's input into the playDicePoker(numRolls: int) -> dict function, and finally passes the returned dictionary into printResults(numRolls: int, handsWon: dict) -> None. (Bonus 5 points)

HINT: I would first make a function countFrequencies(dice: list) -> dict that counts the frequencies of each value in the roll. This will come in handy for a lot of these other functions. I would also recommend going back to the last part of lab 2 and copying some code to make this function.