Hash Tables

Exercises

1- Find the most repeated element in an array of integers. What is the time complexity of this method? (A variation of this exercise is finding the most repeated word in a sentence. The algorithm is the same. Here we use an array of numbers for simplicity.)

```
Input: [1, 2, 2, 3, 3, 3, 4]

Output: 3
```

Solution: HashTableExercises.mostFrequent()

2- Given an array of integers, count the number of **unique** pairs of integers that have difference k.

```
Input: [1, 7, 5, 9, 2, 12, 3] K=2

Output: 4
```

We have four pairs with difference 2: (1, 3), (3, 5), (5, 7), (7, 9). Note that we only want the number of these pairs, not the pairs themselves.

Solution: HashTableExercises.countPairsWithDiff()

3- Given an array of integers, return **indices** of the two numbers such that they add up to a specific target.

```
Input: [2, 7, 11, 15] - target = 9

Output: [0, 1] (because 2 + 7 = 9)
```

Assume that each input has **exactly** one solution, and you may not use the *same* element twice.

Solution: HashTableExercises.twoSum()

4- Build a hash table from scratch. Use linear probing strategy for handling collisions. Implement the following operations:

- put(int, String)
- get(int)
- remove(int)
- size()

Solution: **HashMap**