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Assignment 5 Canvas Submission:

- 1.) Using `hash_function_1` to hash the words "ape" and "pea" would both produce hashes of 310, whereas using function 2 to process "ape" yields 624 and "pea" yields 605. This is the case because hash 2 multiplies the Unicode point value of each character by its index, giving different weight to each character, where function 1 only adds together the point values of each character without giving them different weight. This means that different words with the same letter counts in them will produce the same hash with function 1 but usually a different hash with function 2.
- 2.) Function 2 is better able to distinguish between different keys and spread them out over the hash map indices, reducing collisions and therefore increasing efficiency.
- 3.) `empty_bucket()` may return a different value for each function, but `table_load()` will be the same between the two functions. Functions 1 and 2 map keys differently (with function 1 producing more collisions), so there is a difference in the collision chance for a given key between the two functions. Depending on the input keys then, a map using function 1 may have a less uniform distribution of keys than function 2. This may result in a difference in empty buckets. The total number of elements in comparison to the capacity of the map will not be determined by the function used, however, and so the average table load will be the same regardless of function used.