

CSC 385

Homework Assignment, Module 11

15 points

Instructions

Part 1 (5 points)

Suppose you are creating a hashing function to use for storing string data in a hashtable. One candidate hashing function would be to sum the ASCII or Unicode values for each character, and use that result as the hashcode. Describe one potential pitfall to using this algorithm as a hashing function for string data.

Part 2 (10 points)

Assume you have a `HashMap` class that uses a load factor of 0.75 (regardless of the collision resolution mechanism used), and has an initial array size of 13. The table below contains a list of items, along with associated hashcodes that were computed using some hypothetical hash function. Assume the items are added to a newly created instance of the `HashMap` class in the same order in which they are listed in the table. Based on this information, answer the following questions:

1. (5 points) Show what the array of the `HashMap` would look like after all the items below have been added, assuming the `HashMap` class uses **separate chaining hashing** to resolve collisions, and that the threshold is calculated based on the number of items present, not the number of array cells that contain at least one item. Assume the array is resized when the current item to be added will make the total number of items greater than or equal to the threshold value.
2. (5 points) Show what the array of the `HashMap` would look like after all the items below have been added, assuming the `HashMap` class uses **quadratic probing** to resolve collisions instead of separate chaining hashing. Assume the array is resized when the current item to be added will make the total number of items greater than or equal to the threshold value.

Note that for both questions, you do not need to compute the hashcodes, you only need to determine where the items would be placed into the underlying array of the `HashMap`.

Item	Hashcode
Patriots	1342415383
Steelers	700056533
Chargers	330628742
Texans	532139483
Packers	217142585
49ers	2112979549
Saints	207265348
Giants	1631149803

Grading Rubric

	Points
Part 1	5

Part 2, Question 1	5
Part 2, Question 2	5
Total:	15