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Assignment 5.1

Data Structures

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Module 5

Part 1: Answer the following in a Word or PDF document.

a. Explain how a hash function is used.

A hash function takes an input and converts it into a fixed integer that assigns this integer to the linked “key” and “value” pair.

b. How might a string hash function be written?

s[0]\*31^(n-1) + s[1]\*31^(n-2) + ... + s[n-1]

HashMap<String, String> newHashMap = new HashMap<String, String>();

c. Explain why we might choose to use a hash function rather than search for a key.

It has a very small time efficiency O(1), meaning it saves a lot of time, uses less memory, and it also handles collisions.

d. What hash function does the Java Util HashMap use for hashing strings?

hashCode=s[0]×31(n−1)+s[1]×31(n−2)+…+s[n−1]

s[i] is the “i -th” character of the string, and ( n ) is the length of the string.