Assignment 5.1

1. Explain how a hash function is used.

A hash function typically works by converting a search key into a fixed string of characters, typically an integer, which is called the hash code. The hash code is then compressed into a range of indices for the hash table. Hash functions are meant to always produce the same hash value. Hashing can be very useful for data storage and retrieval and security purposes.

1. How might a string hash function be written?

To write a hash function for a string, the best approach is to multiply the Unicode value of each character by a factor based on the character’s position within the string. This is typically written as the expression . U represents the Unicode value for the character, g represents a constant and n represents the length of the string.

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

A hash function provides a better time complexity being O(1) rather than searching for a key which is O(n). This makes hash functions much more effective in large datasets. Hash functions are also more reliable as the hash function will always produce the same hash value. Hash functions also work with any data type making it much more flexible.

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

Java util HashMap uses the hashCode() method for hashing strings. It works by assigning the letter to the Unicode value and then summing the total of the Unicode numbers to get the hashcode.