BLG 335E
Homework 3 Report
150130032 – Baran Kaya

Q1)

	Dictionary	List
Insertion	373332181 ns 0.37 sec	175679469 ns 0.17 sec
Lookup	633350762233 ns 633.35 sec	2907292372268 ns 2907.29 sec

Q2)

I measured runtimes when bookCharacter objects insertion occuers. Dictionary inserion time is 0.36 seconds and list insertion time is 0.17 seconds. List is 2x faster than dictionary because list just adds elements at the end of the vector. However dictionary calculates every elements positions' before putting them into the array. Therefore list's vector inserion is faster than the hash table in the dictionary.

When we check the lookup times dictionary is nearly 5x faster than the list lookup time. That is because dictionary stores the bookCharacter objects with keys their key values. Therefore finding them with their key value in the array is easier than the list's vector. Because vector traverse all vector for finding the correct key bookCharacter object.

Q3)

Average number of collisions (first 1000) | 2
Average number of collisions (first 10000) | 357
Average number of collisions (first 100000) | 80031
Average number of collisions (overall) | 1326492

It was not stay the same, it increased with element number exponentially. That is because the more elements the hash table has the more collision can occur when inserting new elements. When the hash table is nearly full, new elements' hash function results are going to the same as the full elements position. After that new element is going to go the second hash function and its result can be full too. Therefore, collisions are going to increase when the hash table is nearly full.

Q4)

The last element can be the key that program looking for and it is the worts case for lookup.

Note: I tried to compile it with "gcc -std=c++11 HW3.cpp -o 3" command in SSH server and it shows lots of things that I do not understand. However there is no error in it. Then i tried to compile it with "gcc HW3.cpp -o 3" without C++11 but this time it shows errors due to the chrono library. However it compiles and runs perfectly in Windows OS. I do not understand the situation and why these happened.

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