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CS 150: Data Structures & Algorithms

12/04/2016

Lab -- Hashing(Report)

For this experiment we test our program for 28 different configurations. For each configuration we changed the number of elements in container and the size of container. The whole experiment is divided into two parts.

In the first part, initial value for the number of elements is 70000. For each new configuration we increase this value with 70000. In addition, for each value we run experiment for four times and change the size of container each time. Initial value for size of container is 40000, which for the following configurations is increased by 5000 each time. The following represents the list of configurations created with the combination of these two arguments:

- 70 000(Number of Elements)
    - 40 000 (Size)
    - 45 000 (Size)
    - 50 000 (Size)
    - 55 000 (Size)
- 140 000(Number of Elements)
    - 40 000 (Size)
    - 45 000 (Size)
    - 50 000 (Size)
    - 55 000 (Size)
- 210 000(Number of Elements)
    - 40 000 (Size)
    - 45 000 (Size)
    - 50 000 (Size)
    - 55 000 (Size)
- 280(Number of Elements)
    - 40 000 (Size)
    - 45 000 (Size)
    - 50 000 (Size)
    - 55 000 (Size)

For each configuration, we perform 3 successful and 3 unsuccessful searches. All graphs represent average of these three results. ***Each find operation is performed after creating the container and inserting all the values. Therefore, load factor is the same as the one illustrated on that configuration's Size vs Load Factor graph.***

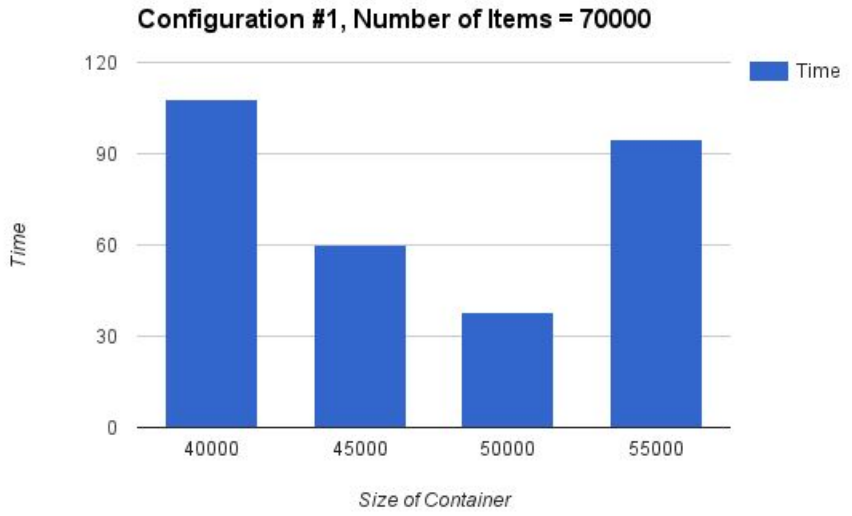

Figure 1.1 - Configuration #1: Insertion Time(ms) vs Size of Container

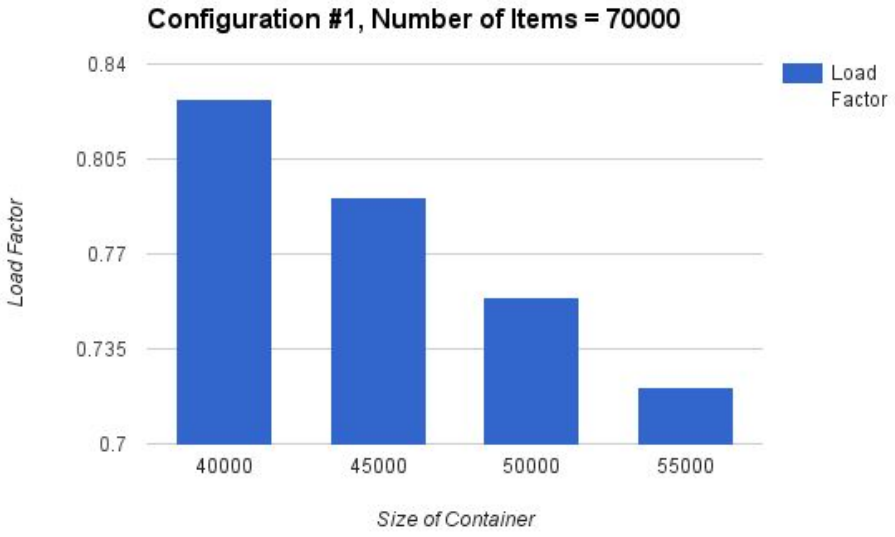

Figure 1.2 - Configuration #1: Load Factor vs Size of Container

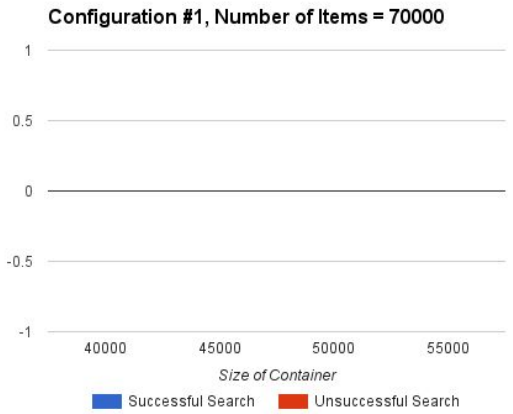

Figure 1.3 - Configuration #1: Time(ms) vs Size of Container(As we see values equal to zero)

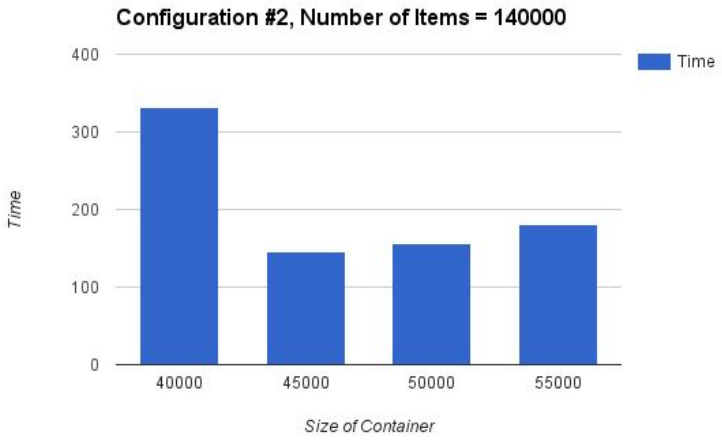

Figure 2.1 - Configuration #2: Insertion Time(ms) vs Size of Container

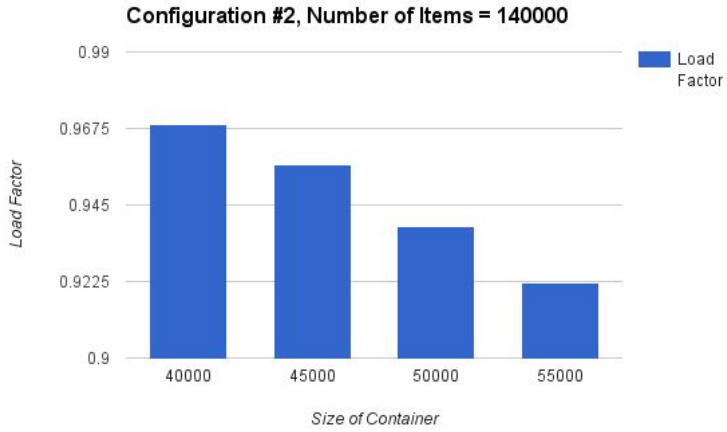

Figure 2.2 - Configuration #2: Load Factor vs Size of Container

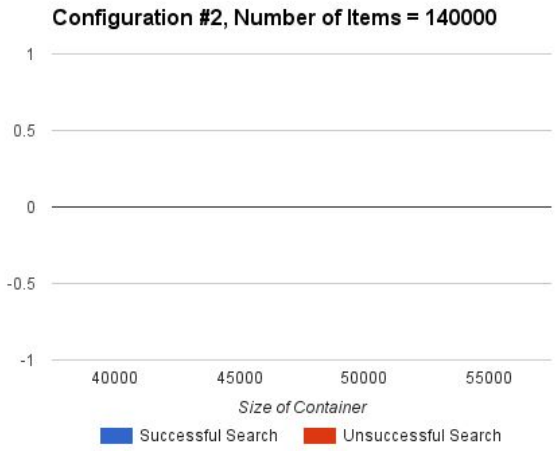

Figure 2.3 - Configuration #2: Time(ms) vs Size of Container(As we see values equal to zero)

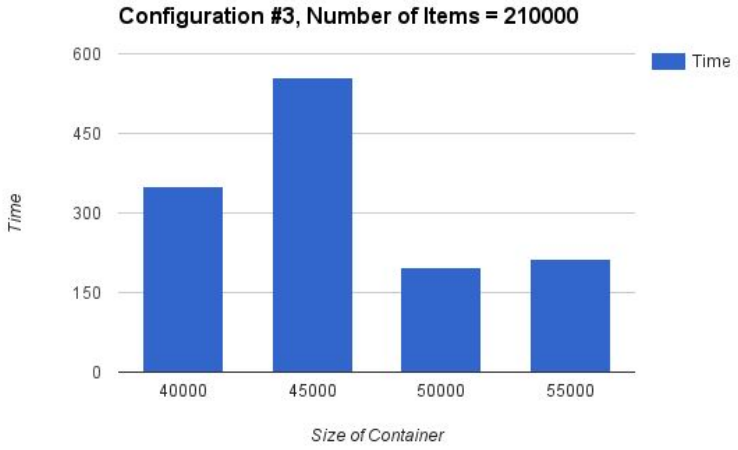

Figure 3.1 - Configuration #3: Insertion Time(ms) vs Size of Container

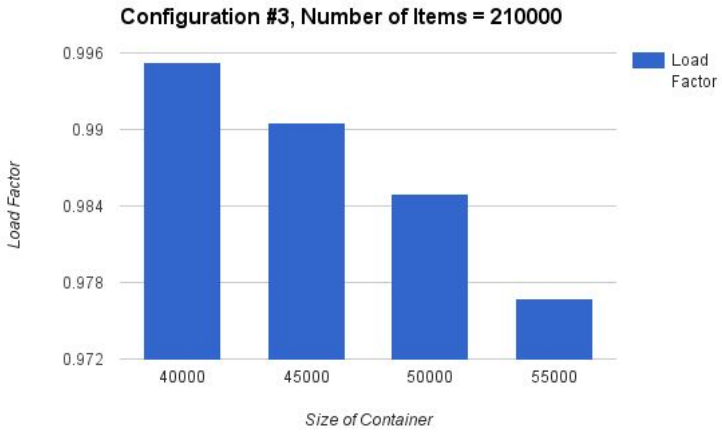

Figure 3.2 - Configuration #3: Load Factor vs Size of Container

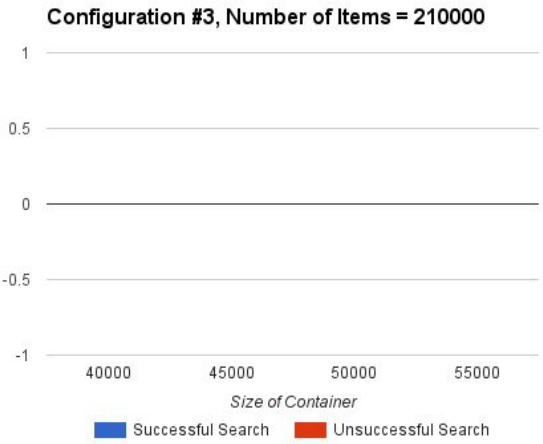

Figure 3.3 - Configuration #3: Time(ms) vs Size of Container(As we see values equal to zero)

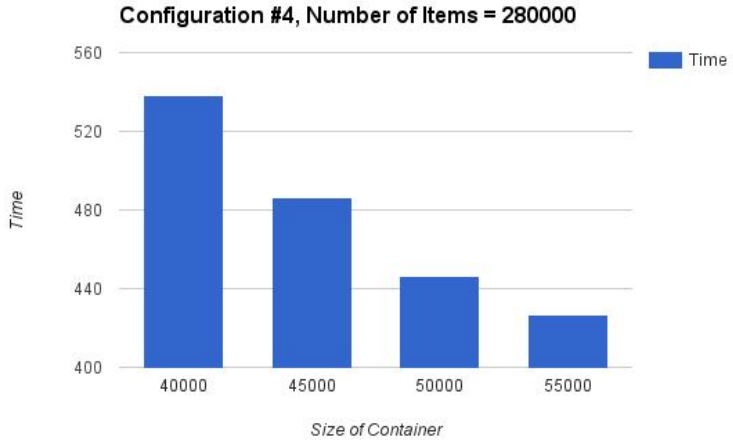

Figure 4.1 - Configuration #4: Insertion Time(ms) vs Size of Container

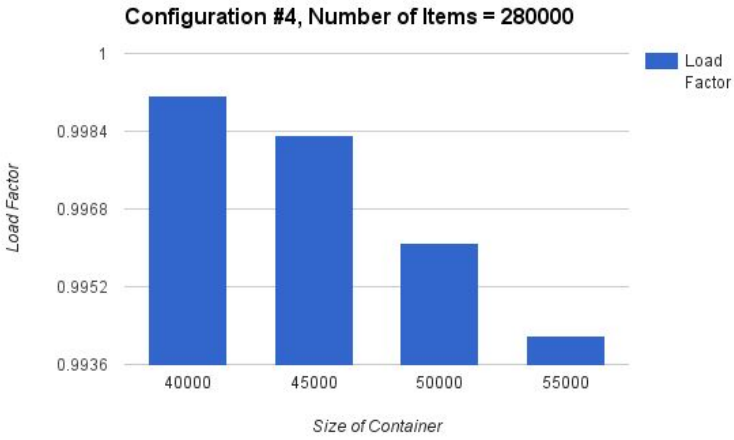

Figure 4.2 - Configuration #4: Load Factor vs Size of Container

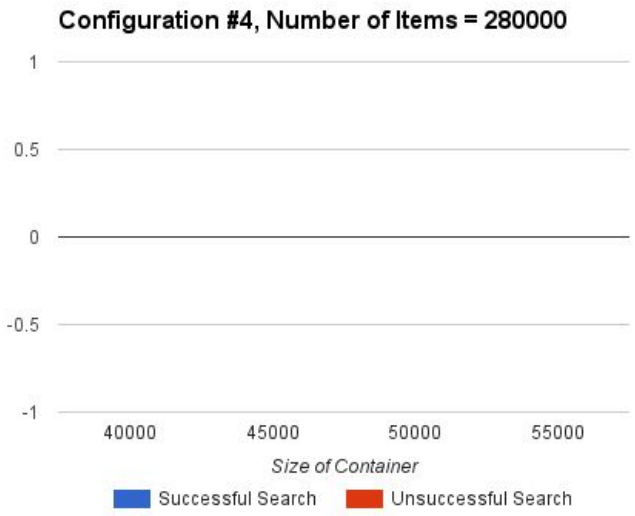

Figure 4.3 - Configuration #4: Time(ms) vs Size of Container(As we see values equal to zero)

For the second part we changed the size of the container as searching, both successful and unsuccessful were extremely close to zero. Therefore, we changed initial value for container size to 50 and increased this value by 50 for each new configuration. The following represents the list of configurations created with the new combination:

- 70 000(Number of Elements)
    - 50(Size)
    - 100 (Size)
    - 150 (Size)
    - 200 (Size)
- 140 000(Number of Elements)
    - 50 (Size)
    - 100 (Size)
    - 150 (Size)
    - 200 (Size)
- 210 000(Number of Elements)
    - 50 (Size)
    - 100 (Size)
    - 150 (Size)
    - 200 (Size)

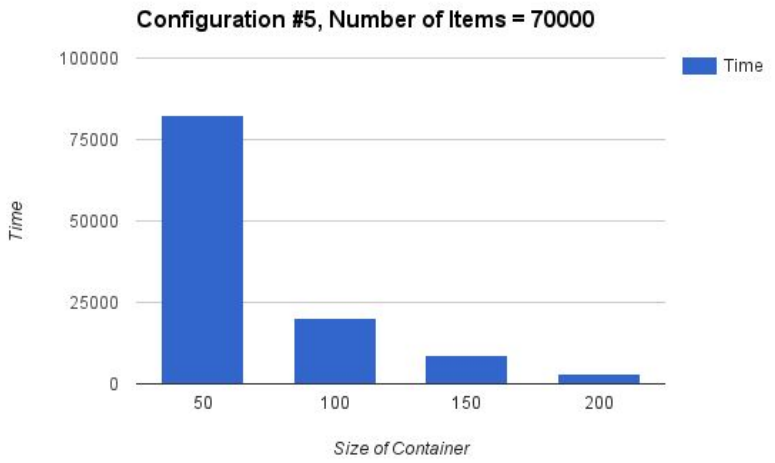

Figure 5.1 - Configuration #5: Insertion Time(ms) vs Size of Container

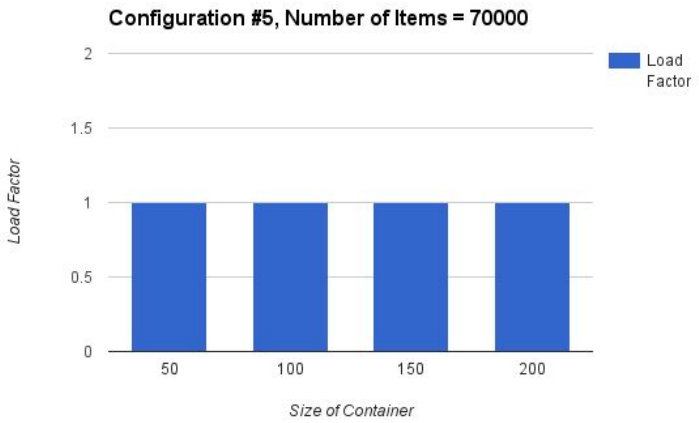

Figure 5.2 - Configuration #5: Load Factor vs Size of Container

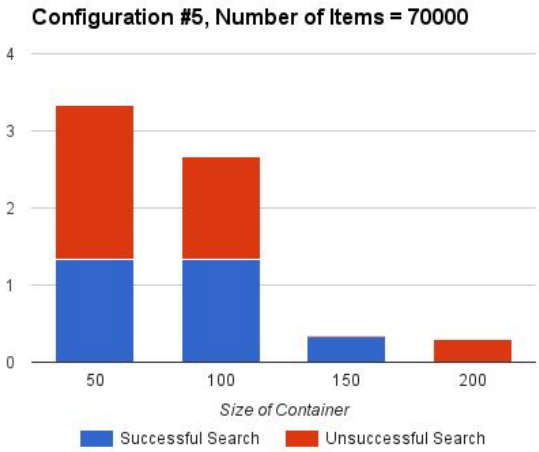

Figure 5.3 - Configuration #5: Time(ms) vs Size of Container(As we see values equal to zero)

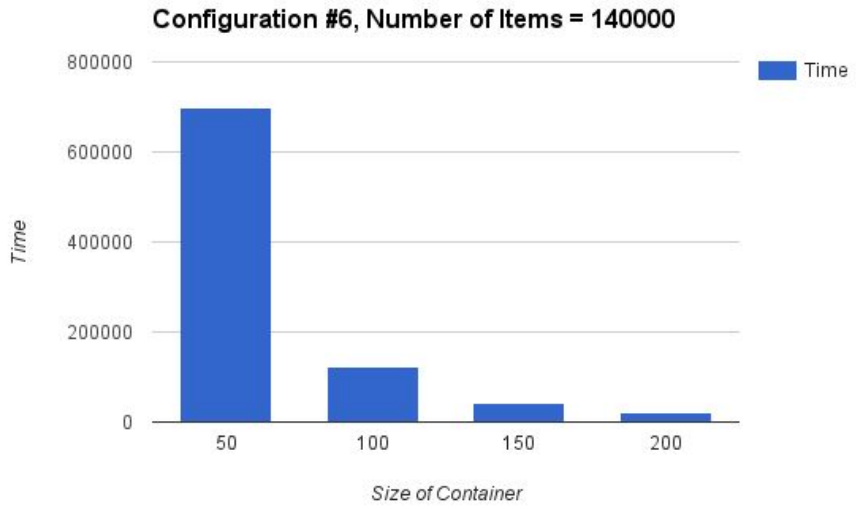

Figure 6.1 - Configuration #6: Insertion Time(ms) vs Size of Container

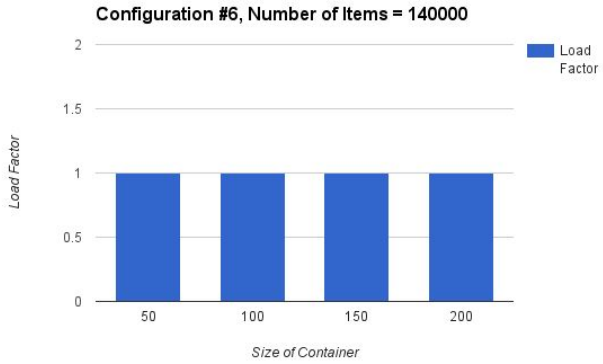

Figure 6.2 - Configuration #6: Load Factor vs Size of Container

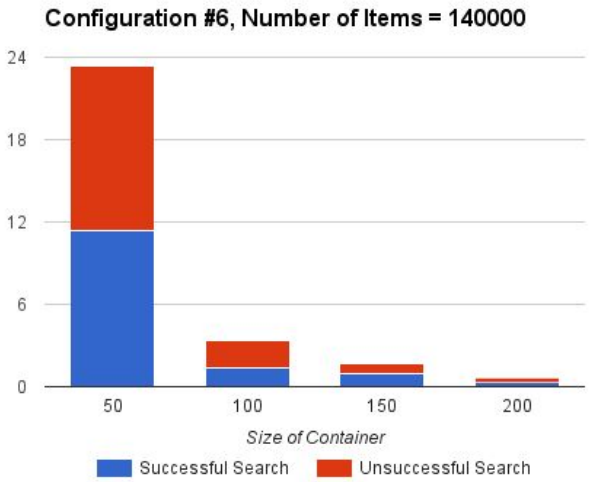

Figure 6.3 - Configuration #6: Time(ms) vs Size of Container(As we see values equal to zero)

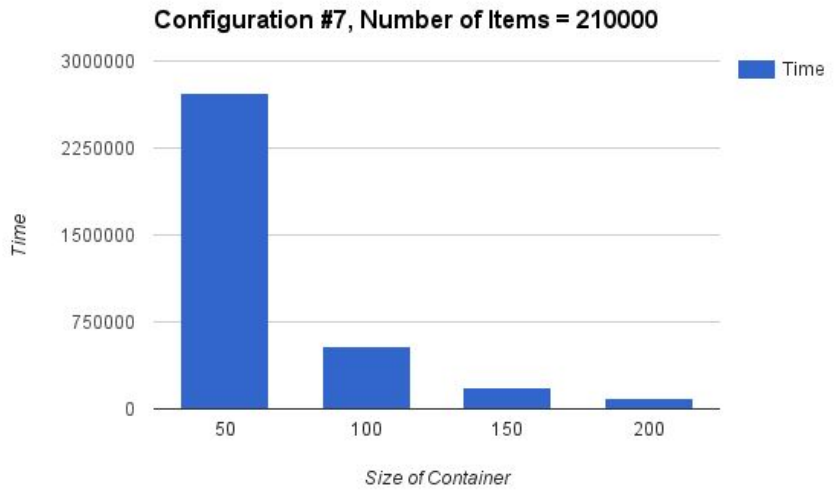

Figure 7.1 - Configuration #7: Insertion Time(ms) vs Size of Container

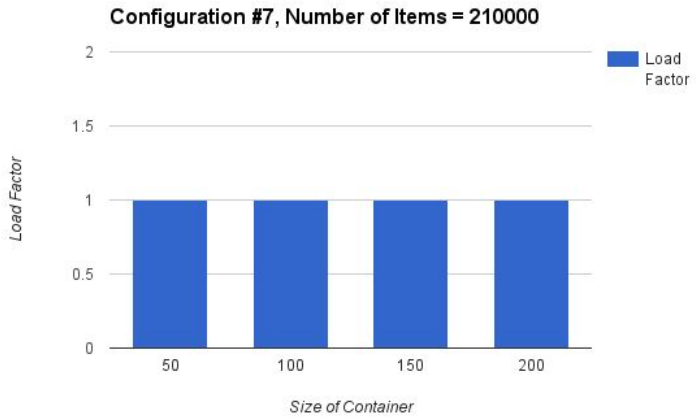

Figure 7.2 - Configuration #7: Load Factor vs Size of Container

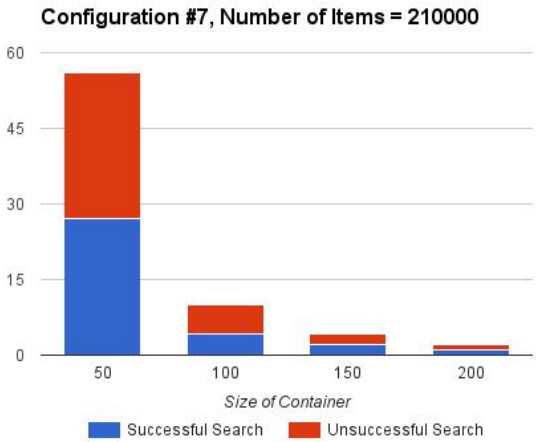

Figure 7.3 - Configuration #7: Time(ms) vs Size of Container(As we see values equal to zero)