

Hypothesis:

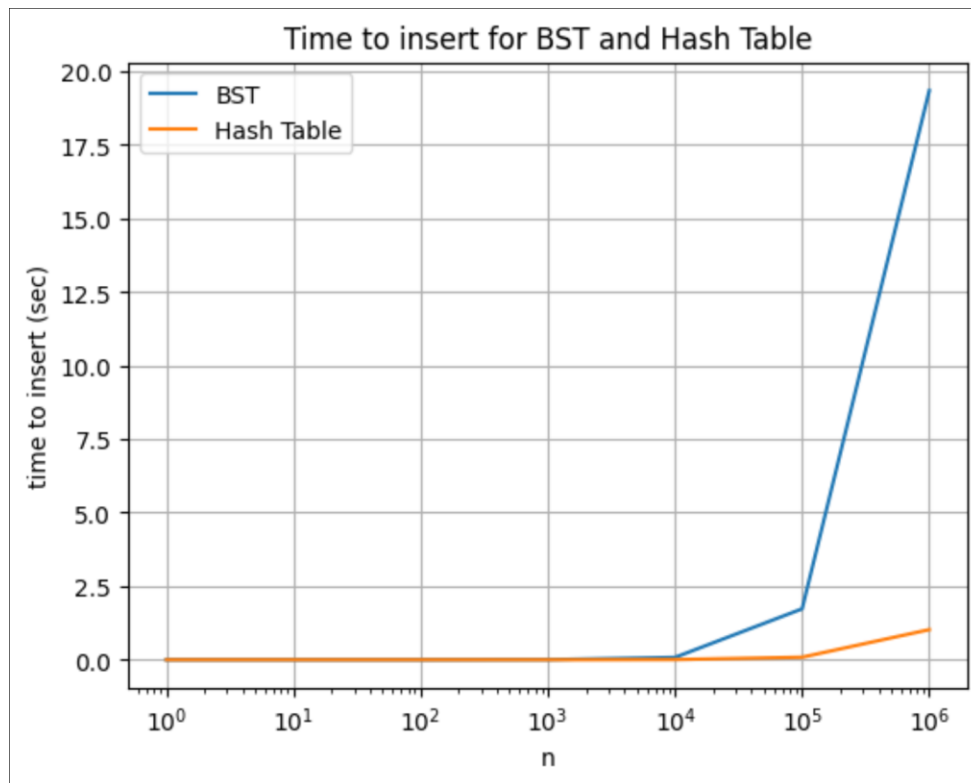
I believe that the difference between the speed of the BST vs the hash table will show by the end almost ten times larger than times for the BST over the hash table.

Methods:

Source Code: <https://github.com/leohoerdemann/HW5/blob/main/Q3.ipynb>

I am doing this question using a jupyter notebook and python 3.11.3. I started by making a class to implement a dictionary using a BST and I used the standard python dictionary since that already uses a hash table. I then run each through timeit and have then insert n random numbers. I loop though that and graph using matplotlib the amount of time each took against the number of inputs.

Results:



Time of each dictionary implementation against the number of inputs inserted.

Discussion:

The output graph showed that the BST increases massively compared to the hash table. Much more than I originally thought. Towards the end it is night and day between the two.

Conclusions:

Under the testing conditions I found that my original hypothesis was not supported. The BST implementation was much slower than I originally thought where towards the end at 10^6 inputs the BST is almost 20 times slower than the hash table.