

Project Report

Part 1

1) do you notice any wastage of memory when items are deleted? If so, can we avoid such wastage and how?

No, based upon our iterator, we do not waste memory after deletions. We use a for loop to check for empty elements.

We iterate this way in order to prevent such memory leakage, but if we used a tail ptr to insert, this could cause me leaks.

2) Can you think of scenario, where there is space in the memory, but no insertion is possible?

Yes, if all the blocks of memory have an element, but any element is not completely full(i.e $\text{value_len} < 116$ bytes). Since we do not store more than one element per block size, there is unused space and no insertion is possible.

3) What is the maximum size of the value when the pointers are 8 bytes?

112 bytes

For Part 2, derive a general expression for the range of numbers that go into the i-th tier.

let k be a number in the ith tier.

$$x * i \leq k < (x * (i+1))$$

where $x = \text{INT_MAX}(2^{32} - 1) / t$