Report

In CS204 HW6, 6 different classes implemented, 3 are abstract classes and remaining 3 are subclasses. Sketch virtual main class, MembershipSketch virtual class which is Sketch class’ subclass, BloomFilter class which is subclass of MembershipSketch class, CardinalitySketch virtual class which is Sketch class’ subclass, HyperLogLog subclass which is subclass of CardinalitySketch class and KMinVal subclass which is subclass of CardinalitySketch class.

BloomFilter class creates a filter according to inputs. According to switch value I used murmur\_hash and ax\_b\_string\_func. According to output of these functions hash valueth bit is changed to 1 in filter array if it was 0. This class has isMember function checks whether given string is in filter or not. However, this approach creates false positive values and at the end evaluatebloom function creates gives us ratios. Truepositive outputs are always same. However, some values of false positives are little bit different.

HyperLogLog class uses one ax\_b\_string\_func and murmur\_hash function is very higher in small values but converges to normal values when sample size increases. This class uses the first log2(b) bits to find index and uses remaining to find consecutive zeros at the end of the bits(rhs). Changes the indexth value in bucket with consequtivezeros if consecutive zeros of this hash is higher than the past value. Also calculates cardinality.

KMinVal class very similar most of the cases. However, not good in smaller values. Besides, it is 1 smaller when array is not filled with hash values. This class stores k min has value in an array and calculate cardinality according to last value of array.