

## Exercise 10.3

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It is possible to combine the results of the Count-Min sketch on  $\sigma_1$  and  $\sigma_2$  to a result for  $\sigma_1 \circ \sigma_2$  under the condition that the results for  $\sigma_1$  and  $\sigma_2$  were computed using the same hash functions. If this is the case, then the 'combined' sketch can be computed by letting  $C_{\sigma_1 \circ \sigma_2}[s, h_s(j_i)] = C_{\sigma_1}[s, h_s(j_i)] + C_{\sigma_2}[s, h_s(j_i)]$ , i.e. by letting the new table values be the sum of those for the separate runs. Another assumption made here is that the tables were stored (*and not just the frequency estimates for each*