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Q1: (a) I found that state code 6 had the most monitoring sites at 402, almost twice that of the second highest state. Sorry for not knowing the name of the state. (b) I had my mapper and reducer methods keep a dictionary of site ID's as to eliminate duplicates. Then in the cleanup method for my reducer I created another map/dictionary for only state codes along with an incrementing value for the number of site ID's for that state, and finally output that second map.

Q2: (a) I found that the east coast has significantly higher average SO2 levels at 6.1 compared to the west coast's 2.2. (b) My mapper and reducer kept sums (sum of SO2 levels measured) and counts (the number of SO2 levels recorded) for the east and west coast areas. Then my reducer cleanup method just calculated and output the mean by sum divided by the count.

Q3: (a) 4:00pm seems to universally be the highest time of day for SO2 levels. (b) This time my mapper and reducer methods maintain maps of <Year + TAB + Hour> as the key and <sum + TAB + count> as the key. Once I collected all the unique keys I output them in the reducer cleanup function with the mean calculated as sum / count.

Q4: (a) Yes! The average SO2 levels per year dropped dramatically from over 9 to under 1. (b) My mapper and reducers keep a map of year, sum, and count to remove and add together duplicates of SO2 levels. Then my reducer cleanup method just wrote out the mean (sum / count).

Q5: (a) Arizona, Puerto Rico, Texas, Nevada, Virgin Islands, Mississippi, Florida, Louisiana, Arkansas, and Oklahoma. (b) My mapper and reducers keep a map of state, sum, and count to remove and add together temperatures for only summer months. Then my reducer cleanup method just wrote out the mean (sum / count) for the top 10 states.

Q6: I'm going to admit I just hard coded what the hottest states were for this question. My mapper and reducer did basically the exact same thing as other questions, keep a map of states, sum, and count if the state was a hot one. Then my reducer cleanup method output the mean (sum / count).

- Arizona 6.1927747980477585
- Arkansas 2.6116126071607306
- Florida 2.705018051620619
- Louisiana 3.46892617234861
- Mississippi 3.0614426494964877
- Nevada 0.6998966780913937
- Oklahoma 4.070519293754898
- Puerto Rico 3.0324226016633675
- Texas 2.737068367691385
- Virgin Islands 2.967796554153948