

Homework 0

ME EN 2550

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Problem 1:

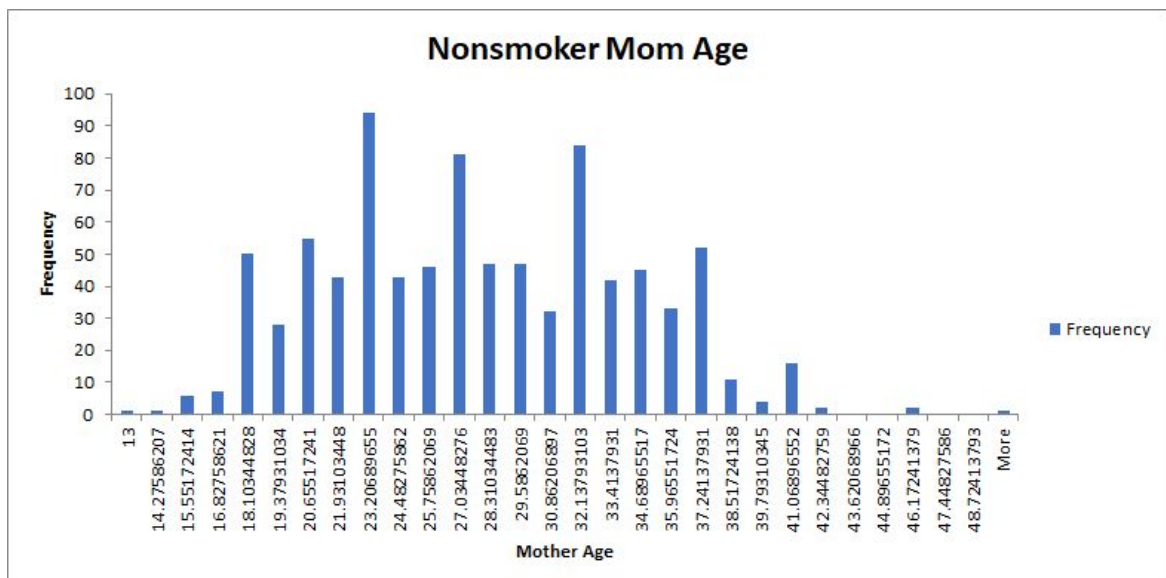
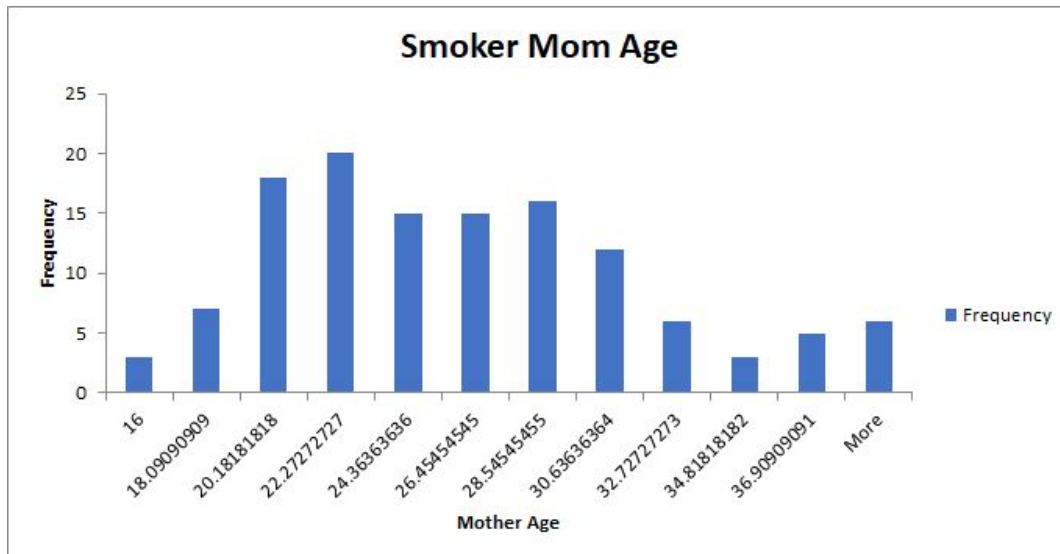
1. The real sequence of coin flips had 7 tails in a row while the made-up sequence did not have nearly as many of same faces in a row at any part of the sequence. Have to look at the bigger picture to really realize randomness.
2. The chance of Evelyn Adams winning the lottery twice in two consecutive years is 1 in 17.3 trillion.
3. It would be surprising if somebody somewhere winning the lottery twice did not happen repeatedly. (Virtually 1 in 1)
4. If a shooter is "hot" their shooting percentage over the next few shots is likely to actually be lower than(or the same as) their long-term average shooting percentage.

Problem 2:

1. Mothers who are smokers: mean age: 25.246 standard deviation: 5.493
Mothers who are nonsmokers: mean age: 27.237 standard deviation: 6.259
The difference between groups is 1.991 years older for nonsmoker mothers. This difference is somewhat meaningful but around with a difference of mean age of around 2 years it is hard to tell much from it. This is evidenced by comparing the difference to the standard deviation we see the difference is smaller than the standard deviation which means within one standard deviation we have the difference between the means.
2. Mothers who are smokers: mean baby weight: 6.829 lb standard deviation: 1.386 lb
Mothers who are nonsmokers: mean baby weight: 7.144 lb standard deviation: 1.519 lb

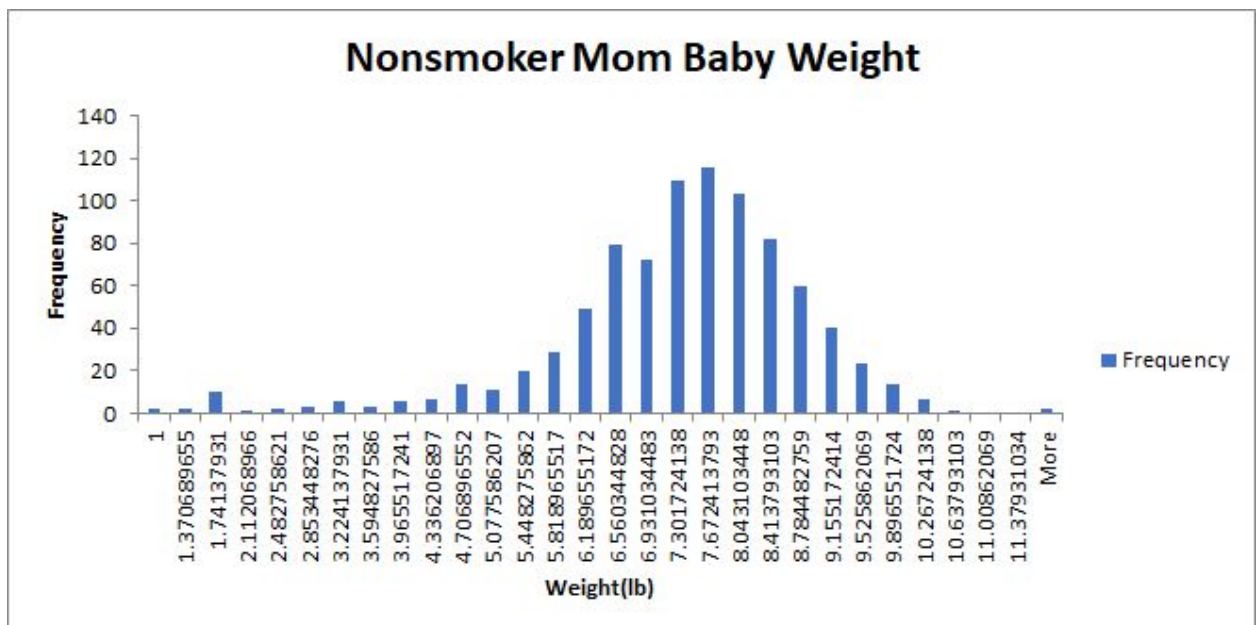
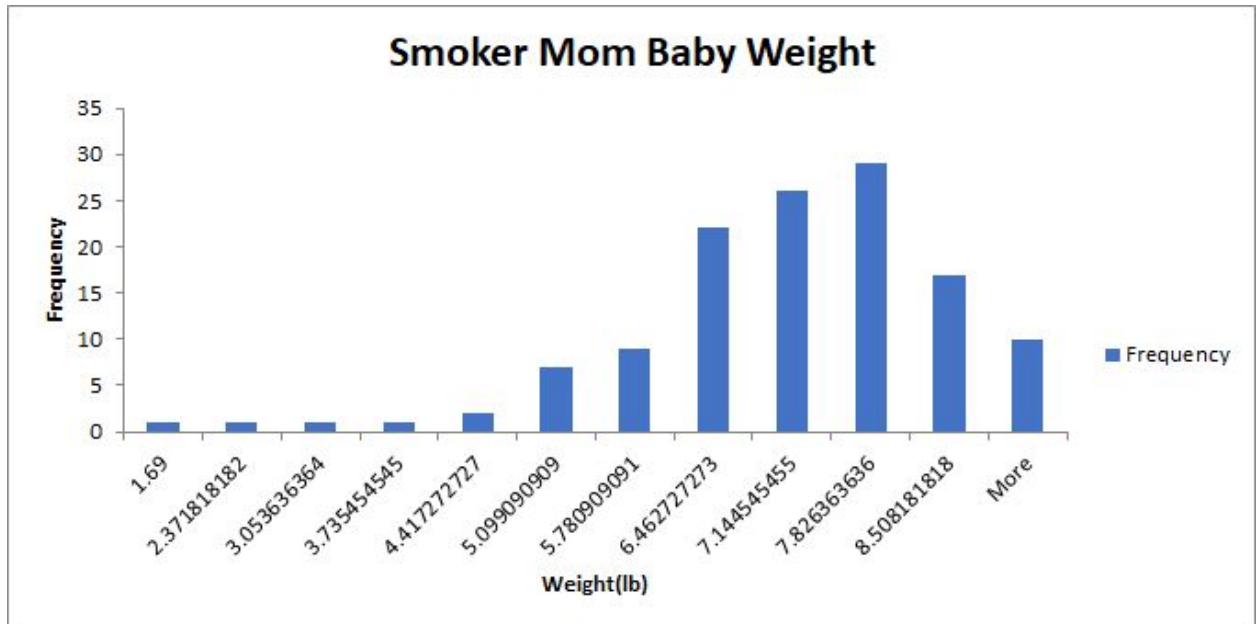
The difference between groups is that the mean of smoker mother's baby weight is 0.315 lighter than nonsmoker mother's baby weight. The difference does not appear very meaningful since comparing the difference to the standard deviation we see that the average difference from the mean is greater than the difference between the means.

3.



It does appear that the distributions of the histograms are different. It appears the histogram of mothers who smoke is less normally distributed (with some skewness) when compared to the nonsmoker mother histogram which appears very normally distributed.

4.



These two histograms do look different with regards to their distribution. The smoker mom baby weight histogram is clearly left skewed while the nonsmoker mom baby weight histogram is still left skewed but more closely resembles the typical normal histogram distribution. This skewness indicates some kind of difference between the data. It is important to note that there is more data for the nonsmoker mothers than the smoker mothers. Overall, it is likely more statistical techniques should be applied to draw relationships between aspects of the data.