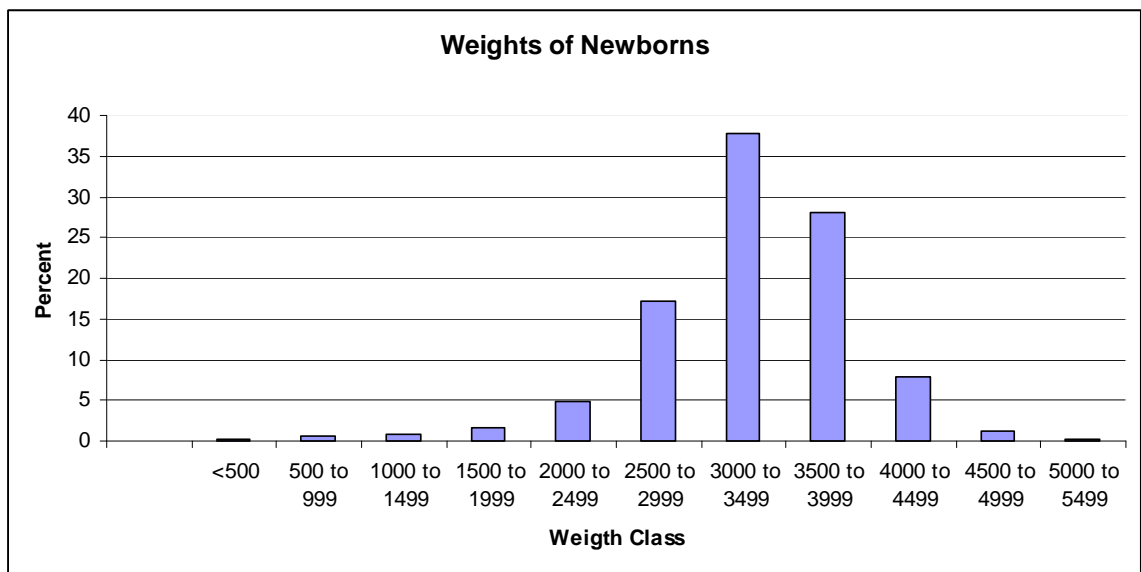


**Key for Chapter 2 problems 2.24 and 2.30.
Graded out of 20 points.**

2.24) Median income is often lower because it is resistant to outliers. There will be many people under 35 yrs making very little (or nothing if you count children, those little parasites). This will bring the median down. However, the few that are making large amounts of money (Shia LeBeouf, for example) will drag the mean up (again, due to the mean not being resistant.)

2.30) a) Percents make more sense than counts if we wish to compare because not every country will produce the same number of babies. If one study states that 688,630 babies were in the 2500 to 2999 gram category and another study states 5,000 in that category we need to realize that unless we know the total number of babies in each study the numbers are meaningless.

b) The total number of babies in this distribution is 4,018,734. The histogram is below.



c) Since there are 4,018,734 babies total the median is in position 2,009,367.5 (so you would average the numbers in the 2,009,367 and 2,009,368 slots). To find Q1 we look at the 2,009,367 numbers less than the median. Out of these the median is in position 1,004,684. To find Q3 we look at the 2,009,367 numbers greater than the median and find that the third quartile will be in the 1,004,684 position for these numbers, making it position 3,014,051 total.

The median will fall in the 3000 to 3499 gram weight category. Q1 will also fall in this same category. Q3 will be in the 3500 to 3999 gram weight category. (To find these, sum up the number of babies in a given category with all the lower weight categories. For example, there are 6,268 babies in the first category and 22,845 in the second. If we line up the babies in order of their weight the first 6,268 will be from category 1 but the next 22,845, i.e. babies numbered 6269 to 22845+6269=29,114.

COMMON MISTAKES

- 1) On 2.24, many people gave definitions of mean and median without address the actual question of why this particular example would have such a drastic numerical difference between mean and median. (**Varied, typically -6, depends on answer.**)
- 2) On 2.30 many people found the median using 1,521,884 as the total number of observations. This is not the total number of observations, this is the number of observations in the most “popular” weight class, 3000 to 3499 grams. (-2)
- 3) When calculating percents, make sure you move the decimal point. If 23 out of 100 people are in a category, then $23/100=0.23$ means 23%, not 0.23%, fell into that category. (-1)