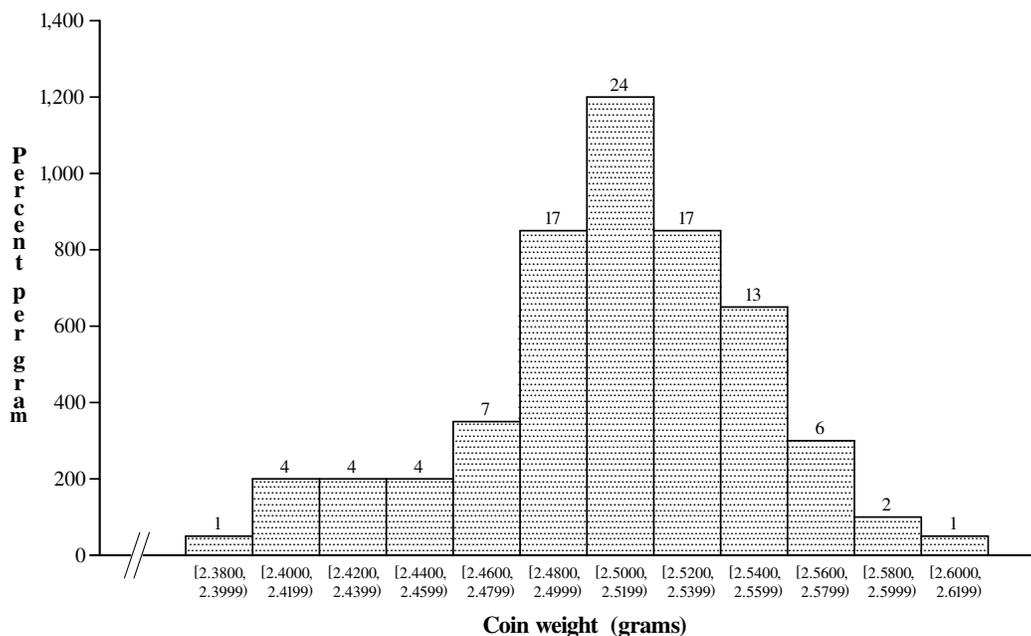


Figure 2.5c. SAMPLE ERROR: Coin Weight Data

Table 2.5c.1: Frequency table for weights of 100 new U.S. cents weighed on an accurate balance

Class interval (grams)	number of coins in		total for 100 coins
	1st 50	2nd 50	
2.3800-2.3999	0	1	1
2.4000-2.4199	1	3	4
2.4200-2.4399	3	1	4
2.4400-2.4599	2	2	4
2.4600-2.4799	5	2	7
2.4800-2.4999	9	8	17
2.5000-2.5199	13	11	24
2.5200-2.5399	8	9	17
2.5400-2.5599	6	7	13
2.5600-2.5799	3	3	6
2.5800-2.5999	0	2	2
2.6000-2.6199	0	1	1
Total	50	50	100

Histogram for weights of 100 new U.S. cents weighed on an accurate balance



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- 1 Use the data in Table 2.5c.1 above to calculate the approximate *average* weight of the coins in:
 - the *first* roll of 50 coins; the *second* roll of 50 coins; all 100 coins.
 - What *assumption(s)* underlie your calculations?
 - How close do you consider your values to be to the *true* averages for the three sets of coins? Explain briefly.
 - Calculate an upper and a lower bound for the true average weight of the 100 coins.
 - How closely do the three approximate averages *agree* with each other?
 - What do you conclude from the agreement, or lack of agreement, among the three approximate averages?

- 2 Use the data in Table 2.5c.1 above to calculate the approximate *range* of the weights of the 100 coins.
 - Find an upper and a lower bound for the *true* range of the 100 weights.

(continued overleaf)

- ③ Instead of the approximate average weights you calculated in Question 1, can you calculate the three corresponding *medians*?
- If *Yes*, calculate the approximate median weight for the 100 coins.
 - How does the *accuracy* of this approximate value for the median compare with that of the corresponding average?
 - If *No*, explain why.
- ④ What are the *statistical* characteristics of the *shape* of the histogram given overleaf on page 2.43 for the 100 coins?
- ⑤ Ignoring Table 2.5c.1 of data, use the *histogram* to find an approximate value for:
- the *average* weight of the 100 coins;
 - the *median* weight of the 100 coins;
 - the *range* of the weights of the 100 coins.
 - For each sample attribute, how does the accuracy of the approximate calculation from the histogram compare with that from Table 2.5c.1? Explain briefly.
- ⑥ Construct histograms, like the one given overleaf on page 2.43, for *each* of the two rolls of 50 coins.
- How close is the '*agreement*' between the two histograms; indicate clearly in your answer the *characteristic(s)* of the histograms you are using as the basis of your comparison.