

AP Statistics**Inference for Means**

1) A statistics class decided to check the weights of bags of small fries at a local McDonald's to see if, on average, they met the "target value" of 74g. They bought 32 bags during two different time periods on two consecutive days and weighed the fries. The data is given below. Is there evidence that this McDonald's was not meeting its target? Provide statistical evidence to support your answer.

Mass of Small Bag of Fries (g)

62.8	67.2	103.6	71.1	64.5	67.6	76.5	84.2	82.9	60.2
60.6	76.4	70.9	69.2	62.7	69.4	92.7	71	60.9	63
64.7	83.1	77.1	79.6	77.4	82.7	58.7	72	76.8	84.3
77.6	87.6								

2) Students investigating the packaging of potato chips purchased 6 bags of Lay's Ruffles, marked with a net weight of 28.3 grams. They carefully weighed the contents of each bag, recording the following weights (in grams): 29.3, 28.2, 29.1, 28.7, 28.9, 28.5.

- Do these data satisfy the assumptions for inference? Explain.
- Find the mean and standard deviation of the observed weights.
- Create and interpret a 95% confidence interval for the mean weight of such bags of chips.
- Is there evidence that the company's stated weight of 28.3 grams of chips is correct? Provide statistical evidence to support your answer.

AP Statistics AP Exam Question (1999)

Researchers want to see whether training increases the capability of people to correctly predict the outcomes of coin tosses. Each of twenty people is asked to predict the outcome (heads or tails) of 100 independent tosses of a fair coin. After training, they are retested with a new set of 100 tosses. (All 40 sets of 100 tosses are independently generated). The numbers correct for each of the 20 people were as follows:

Score Before Training (number correct)	Score After Training (number correct)
46	61
48	62
50	53
54	46
54	50
54	52
54	53
54	59
54	60
54	61
55	55
56	59
57	56
58	50
58	56
61	58
61	64
63	57
64	61
65	54

- Do the data suggest that after training people can correctly predict coin toss outcomes better than the 50 percent expected by chance guessing alone? Give appropriate statistical evidence to support your claim.
- Does the statistical test you completed in part (a) provide evidence that this training is effective in improving a person's ability to predict coin toss outcomes?
If yes, justify your answer. If no, conduct an appropriate analysis that would allow you to determine whether or not training is effective.
- Would knowing a person's score before training be helpful in predicting his or her score after training?

AP Statistics AP Exam Question (2000)

A growing number of employers are trying to hold down the costs that they pay for medical insurance for their employees. As part of this effort, many medical insurance companies are now requiring to use generic brand medicines when filling prescriptions. An independent consumer advocacy group wanted to determine if there was a difference, in milligrams, in the amount of active ingredients between certain "name" brand drug and its generic counterpart. Pharmacies may store drugs under different conditions. Therefore, the consumer group randomly selected ten different pharmacies in a large city and filled two prescriptions at each of those pharmacies, one for the "name" brand and the other for the generic brand of the drug. The consumer group's laboratory then tested a randomly selected pill from each prescription to determine the amount of active ingredient in the pill. The results are given in the following table.

Pharmacy	ACTIVE INGREDIENT (in milligrams)									
	1	2	3	4	5	6	7	8	9	10
Name brand	245	244	240	250	243	246	246	246	247	250
Generic brand	246	240	235	237	243	239	241	238	238	234

Based on these results, what should the consumer group's laboratory report about the difference in the active ingredient in the two brands of the pills? Give appropriate statistical evidence to support your response.

3. The following data represent the daily rental for a compact automobile charged by two car rental companies, Thrifty and Hertz, in 10 locations.

City	Thrifty	Hertz
Chicago	21.81	18.99
Los Angeles	29.89	48.99
Houston	17.90	19.99
Orlando	27.98	35.99
Boston	24.61	25.60
Seattle	21.96	22.99
Pittsburgh	20.90	19.99
Phoenix	47.75	36.99
New Orleans	33.81	26.99
Minneapolis	33.49	20.99

Is there significant evidence that Thrifty is less expensive than Hertz at the 1% significant level?

4. Do people walk faster in the airport when they are departing (getting on a plane) or when they are arriving (getting off a plane)? Researcher Seth B. Young measured the walking speed of travelers in San Francisco International Airport and Cleveland Hopkins International Airport. His findings are summarized in the table.

Direction of Travels	Departure	Arrival
Mean speed (feet per minute)	260	269
Standard Deviation (feet per minute)	53	34
Sample size	35	35

(a) Is there sufficient evidence that individuals walk at different speeds depending on whether they are departing or arriving at the airport?

(b) Construct and interpret a 95% confidence interval.

(c) Does the confidence interval you constructed in part (b) support your answer from part (a)? Explain