

1. Al and Larry are mutual fund managers. Al's fund FDCHR has a one-year return of -6% (a loss). Larry's fund TRSEC has a one-year return of 1% (a gain). The 6,000 mutual funds reported by the Wall Street Journal are normally distributed with a mean one-year return of -1% and a standard deviation of 6%

a. What percentage of mutual funds had returns between Al's & Larry's funds? (3 points)

- i. About 37.90%
- ii. About 42.60%
- iii. About 62.10%
- iv. About 62.93%
- v. About 83.26%

b. What are the returns for funds at the 10th percentile and at the 90th percentile? (3 points)

- i. -0.4% and +4.4%
- ii. -1.28% and +1.28%
- iii. -6.68% and 8.68%
- iv. +10% and +90%
- v. -8.68% and 6.68%

c. My financial adviser believes inflation should be taken into account when measuring fund performance. Suppose he adjusts all of the fund returns by subtracting 5% and then multiplying by 2. For example, Al's fund would now return -22% (a loss). I need a return of 7% or more for a fund to qualify as investment quality. What percentage of all funds qualify? (4 points)

- i. about 5.71%
- ii. about 66.28%
- iii. about 94.29%
- iv. this cannot be calculated because $Z > 3.49$
- v. this cannot be calculated from the information provided

$$a) \quad \frac{1 - (-1)}{6} = \frac{2}{6} = +.33 \quad .6293$$

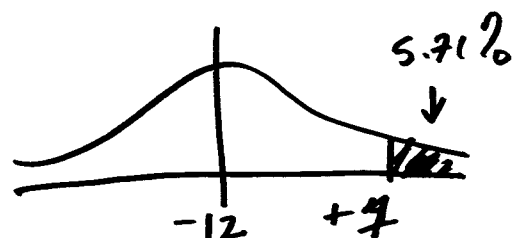
$$\frac{-6 - (-1)}{6} = \frac{-5}{6} = -.83 \quad .2033$$

$$\quad \quad \quad .4260$$

$$b) \quad 10^{th} \quad z = -1.28 = \frac{x - (-1)}{6} \quad \text{solve for } x = -8.68\%$$

$$90^{th} \quad z = +1.28 = \frac{x - (-1)}{6} \quad x = 6.68\%$$

$$c) \quad \frac{7 - (-12)}{12} = 1.58$$



2. A quality initiative is a program of responsive customer service activated by continuously monitored and improved work procedures for company employees. In the course of evaluating the effectiveness of a new quality initiative, a company surveyed 500 employees to indicate how strongly they agreed or disagreed with a series of statements about the new quality initiative. This is a distribution of their responses:

Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
60	178	182	68	12

Suppose we assign the values 1 to "Strongly Agree", 2 to "Agree", 3 to "Neither Agree nor Disagree", 4 to "Disagree" and 5 to "Strongly Disagree". Please fill out the outcomes and probabilities in the table below and then answer the following questions:

a. (4 points)

f(x)	1	2	3	4	5
p(x)	.12	.356	.364	.136	.024

b. (3 points) What is the probability that a randomly selected employee will strong agree or strongly disagree with the new quality initiative?

Assume A is correct

$$(.12) + (.024) = \boxed{.144 \text{ or } .14}$$

c. (3 points) What is the probability that 3 employees, all selected at random, will disagree with the new quality initiative? Assume employee opinions are independent.

Assume A is correct

$$(.136)^3 \text{ or } (.14)^3$$

3. Answer True or False about the properties of histograms that are used to describe large datasets (1 point each)

True	False	Property
✓		They do not display actual values of data
✓		Relative frequencies are labeled on the vertical scale
	✓	They cannot be used to compare distributions with different numbers of observations
	✓	The horizontal scale is optional
✓		The relative frequencies of all classes total 100%

4. The result of issuing a command in Stata:

.summarize debtgro, detail

DEBT GROWTH					

	Percentiles	Smallest			
1%	-106.403	-221.584			
5%	-44.682	-126.907			
10%	-32.131	-119.295	Obs		496
25%	-18.084	-113.102	Sum of Wgt.		496
50%	-8.0135		Mean		-12.6268
		Largest	Std. Dev.		20.46082
75%	-2.2	18.975			
90%	2.981	22.836	Variance		418.645
95%	6.941	23.606	Skewness		-3.695789
99%	18.04	61.479	Kurtosis		30.06029

Please answer the following questions regarding the results:

a. Based on the values of the mean and median, what can you say about the shape of the distribution of the Debt Growth variable? (3 points)

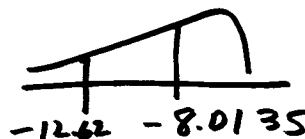
i. It is symmetric around -12.6268

ii. It is left-skewed with its mean < median

iii. It is right skewed with its mean < median

iv. It is left-skewed with its mean > median

v. It is right-skewed with its mean > median



b. Please give the five-number summary for the Debt Growth Variable, just list the values in order from lowest to highest. (3 points)

= 221.584, -18.084, -8.0135, -2.2, 61.479

c. Please give the interquartile range for the Debt Growth Variable. If it is not possible to give this statistic, please write "not possible" below and on your answer sheet. (4 points)

$$Q_3 - Q_1 = IQR$$

$$-2.2 - (-18.084) = 15.884$$

5. A large university with a total enrollment of about 50,000 students has offered Pepsi Cola a contract to sell their products at all university facilities. Currently, Coca-Cola has an exclusive contract, but this will change if Pepsi accepts the offer.

Pepsi is faced with a problem, they do not know how many soft drinks are sold weekly at the university. Their regional vice president of sales believes that their share will be five soft drinks a week per student if they accept the contract. This estimate is based on their past experiences at other campuses which also sell both Pepsi and Coke. Coca-Cola is unwilling to share their information on sales with Pepsi at this university.

The business school suggests that a survey of students will provide information about soft drink sales on the campus. Accordingly, a survey is performed that asks 1000 students (selected at random from computerized enrollment lists) how many soft drinks they purchase on campus in a week. From the survey, the average number of soft drinks purchased on campus in a week was 5.4 with a standard deviation of 2.9.

Please answer the following questions:

a. (2 points) The parameter is:

- i. 50,000 students
- ii. 250,000 soft drinks
- iii. 1000 students
- iv. 5.4 soft drinks
- v. impossible to estimate

or acceptable

b. (2 points) The statistic is:

- i. 50,000 students
- ii. 250,000 soft drinks
- iii. 1000 students
- iv. 5.4 soft drinks
- v. $5.4 * 50,000$ or 270,000 soft drinks

c. (2 points) The population is:

- i. 50,000 students
- ii. 250,000 soft drinks
- iii. 1000 students
- iv. $5.4 * 50,000$ or 270,000 soft drinks
- v. impossible to estimate

d. (2 points) The sample is:

- i. 50,000 students
- ii. 250,000 soft drinks
- iii. 1000 students
- iv. 5.4 soft drinks
- v. $5.4 * 50,000$ or 270,000 soft drinks

e. (2 points) This study is:

- i. a Randomized Controlled Experiment
- ii. a Randomized Experiment without Controls
- iii. an Observational Study
- iv. an Observational Study with multistage sampling