

Test 1 Checklist

1. be able to use your calculator to work problems as in class/HW
2. data: qualitative vs quantitative, continuous vs discrete
3. random variable: represents each observation as a real number (e.g. Sophomore=2)
4. visualizing data distributions:
 - frequency table
 - histogram
 - pie chart
 - stem-leaf plot
 - box-whisker plot
5. relative frequency (probability density function PDF)
6. cumulative frequency (cumulative distribution function CDF) - running total
7. be able to fill in missing entries in a distribution table
8. shape: symmetric, left/right skewed, bell, uniform, bi-modal
9. statistic - numerical value that summarizes some aspect of the data set
 - location: arithmetic mean $\bar{x} = \frac{\sum x_i}{n}$, median, mode, quartiles
 - dispersion: range, IQR, standard deviation s , variance s^2
10. 5 number summary, outliers
11. weighted mean (observations/measurements in L1, put the weights/frequencies in L2)
$$\bar{x} = \frac{\sum x_i w_i}{\sum w_i}$$
12. be able to read an Excel printout and answer questions about the distribution
13. use the CDF column to get percentiles
14. interpretations:
 - mean (reflects total) vs median (reflects typical)
 - 50% of data between Q_1 and Q_3
 - lower standard deviation - more consistent, predictable
 - z-score: $z = \frac{x - \bar{x}}{s}$ gives unit/scale neutral measure of position relative to the mean
15. be able to set up and solve an algebraic equation to find unknown values
16. percentages, proportions, ratios
17. per-capita statistics (population of U.S. is about 315 million)
18. geometric mean
 - percent change \rightarrow compounding factor
e.g. up 25% is a factor of 1.25, and down 25% is a factor of 0.75

- if you know all the factors, multiply and take the n th root

$$\bar{x}_g = (x_1 \cdot x_2 \cdot x_3 \cdots x_n)^{1/n}$$

- if you know the starting and final values,

$$\bar{x}_g = \left(\frac{\text{finish}}{\text{start}} \right)^{1/n}$$

- to convert to an average percent change, subtract 1
e.g. 1.07 factor corresponds to 7% growth, 0.93 factor corresponds to 7% decay.

19. probability of an event “E”

(a) $0 \leq P(E) \leq 1$

(b) the complement of E (“not E”) is denoted \bar{E}

$$P(\bar{E}) = 1 - P(E)$$