Instructions: For this portion of the exam, answer the questions in words or by creating graphs or tables in Excel. You will be asked to submit your work (scan this portion of the exam or compile photo images of the pages in a single document), and you will be asked to submit your Excel work file. You will only be able to submit two files to the Canvas Exam #2 Part 2.

If you need data for the exam, use the same file as you used for Part 1: **154exam2data.xlsx.**

Academic Integrity Statement

I affirm that, I, _____ (student name), do attest that I alone am completing the problems on this test without receiving unauthorized assistance. I understand that violations of academic integrity may result in sanctions, up to and including expulsion from the college.

_____(Student Signature)

_____(Student ID number)

Attach a copy of your photo ID to the online submission (there is a question drop box for it). The ID must be a photo ID. A Driver's license, School ID (NOVA or otherwise), or a work ID are acceptable as long as it contains your full name and photo.

1. Using the same data on Sheet 7, make a histogram of car value. Label your graph appropriately with axis labels and a descriptive title. **Describe the shape of the graph: is it symmetric, left skewed, right skewed or some other shape?** (6 points)

2. Using the same data on Sheet 7, make a boxplot. **Does the boxplot support your description of the skew or symmetry above? Explain why or why not.** (6 points)

3. On Sheet 8, **does the data provided represent a probability distribution? Explain your reasoning.** (4 points)

4. Create a simulation in Excel that will model 100 rolls of a 20-sided die whose sides are numbered 1-20. Freeze a copy of the simulation, and **report the average outcome of the rolls, and the proportion of rolls that resulted in a 9.** (10 points)

5. What does it indicate for the skewness of a histogram if the mean is higher than the median? (3 points)

6. A boxplot comparing the ages of men and women in a sample is shown. Describe any differences you notice between the ages of men and women according to the graph. (5 points)

Comparative Boxplot of Age by Gender
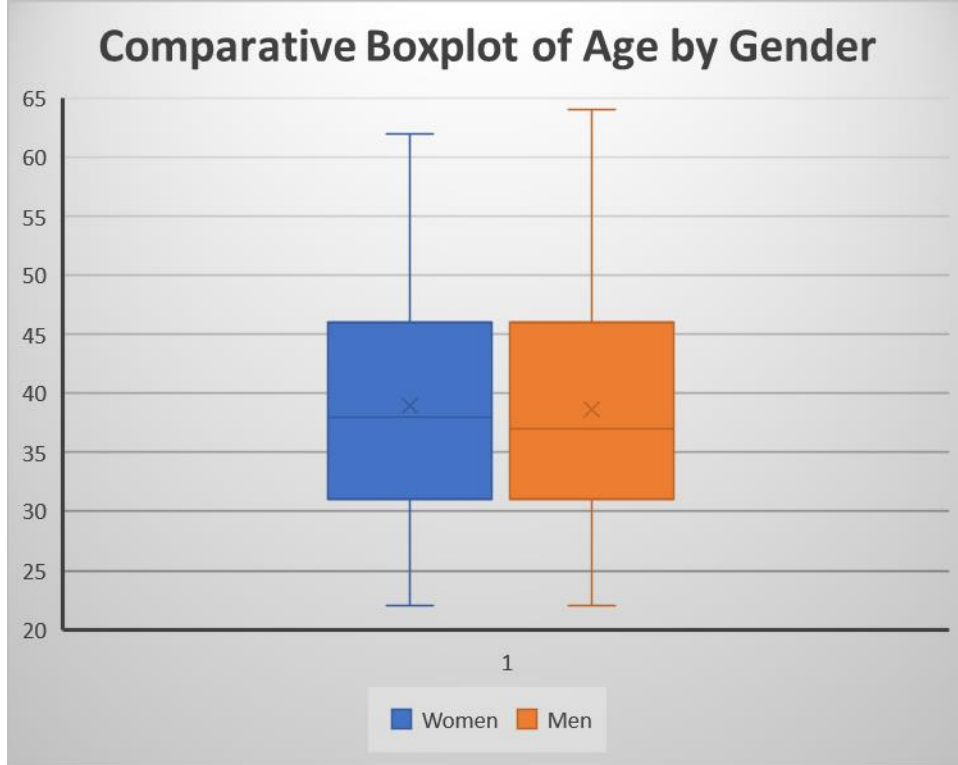
7. A screenshot below shows a small dataset, sample size 10. Based on the information shown, write the Excel formulas you'd need to calculate the requested values. (4 points each)

	AF	AG	AH	AI	AJ	AK
1		20				
2		22				
3		26				
4		23				
5		24				
6		18				
7		32				
8		24				
9		31				
10		28				
11						

a. What formula would be needed to find the mean of the data?

b. What formula would be needed to find the sample standard deviation?

c. What formula would be needed to find the population standard deviation?

8. When a standard deviation value is requested and the problem does not specify whether to calculate the sample or population standard deviation, which one should you assume? (3 points)

9. Three coins are flipped and the outcome of each flip is recorded as either H or T. What are all the possible outcomes of the three flips? (6 points)