ENGR 0020 PROBABILITY AND STATISTICS FOR ENGINEERS I
Recitation Week 1

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Office hour: Thursday 2:00 – 3:00pm, 1023 Benedum hall

Goals:
1. To help to understand the lecture and homework questions.
2. To take quizzes for getting the feedback of the class. The quizzes will take 10 mins at the end of recitation.

1. (Compute the data statistic; Ex 1.14 P30)
A tire manufacturer wants to determine the inner diameter of a certain grade of tire. Ideally, the diameter would be 570 mm. The data are as follows:

$$572, 572, 573, 568, 569, 575, 565, 570.$$

(a) Find the sample mean and median.
(b) Find the sample variance, standard deviation, and range.
(c) Using the calculated statistics in parts (a) and (b), can you comment on the quality of the tires?

2. (Data Plot; Ex 1.22, P31)
The following data are the measures of the diameters of 36 rivet heads in 1/100 of an inch.
6.72 6.77 6.82 6.70 6.78 6.70 6.62 6.75 6.66 6.66 6.64 6.76 6.73 6.80 6.72 6.76 6.76 6.68 6.66
6.62 6.72 6.76 6.70 6.78 6.76 6.67 6.70 6.72 6.74 6.81 6.79 6.78 6.66 6.76 6.76 6.72
(a) Compute the sample mean and sample standard deviation.
(b) Construct a relative frequency histogram of the data.
(c) Comment on whether or not there is any clear indication that the sample came from a population that has a bell-shaped distribution.

3. (Probability Concept; Ex 2.10, P43)
An engineering firm is hired to determine if certain waterways in Virginia are safe for fishing. Samples are taken from three rivers.
(a) List the elements of a sample space S, using the letters F for safe to fish and N for not safe to fish.
(b) List the elements of S corresponding to event E that at least two of the rivers are safe for fishing.
(c) Define an event that has as its elements the points *{FFF, NFF, FFN, NFN}.*

4.(Event Operation; Ex 2.12, P43)

Exercise and diet are being studied as possible substitutes for medication to lower blood pressure. Three groups of subjects will be used to study the effect of exercise. Group 1 is sedentary, while group 2 walks and group 3 swims for 1 hour a day. Half of each of the three exercise groups will be on a salt-free diet. An additional group of subjects will not exercise or restrict their salt, but will take the standard medication. Use Z for sedentary, W for walker, S for swimmer, Y for salt, N for no salt, M for medication, and *F* for medication free.

(a) Show all of the elements of the sample space *S*.

(b) Given that A is the set of nonmedicated subjects and B is the set of walkers, list the elements of A∪B.

(c) List the elements of A∩B.