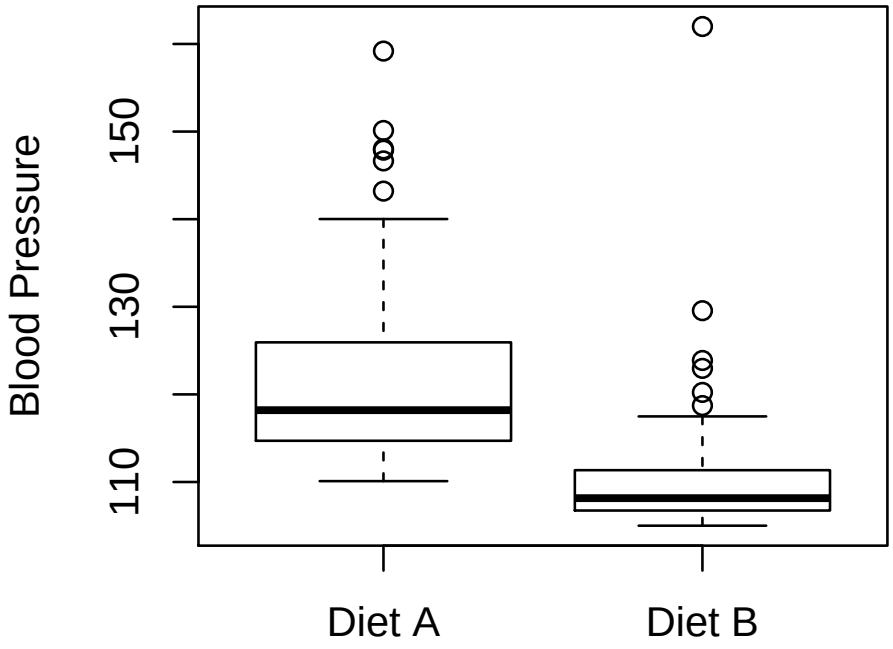
Introduction to Biostatistics (Stats 8)

Midterm Exam – A

Duration: 1:00 to 1:50 PM

Name: Student ID:



1. Consider the above figure.
   (a) Comment on the relationship between diet type and blood pressure.
   (b) Which group has a larger IQR?
   (c) Which group has a larger range?

2. To investigate the relationship between car accidents and cellphone use, we conducted a study where 40 drivers were randomly assigned to one of two groups. One group used a cellphone while driving through a zigzag path set up by traffic cones, the other group did not use a cellphone while driving through the same path. For each driver, we recorded whether he/she hit any traffic cone. We obtained the following contingency table:

	Did not hit any traffic cone	Hit at least one traffic cone
Did not use cellphone	18	2
Used cellphone	12	8

   (a) Comment on the type of the study we have conducted and identify the response and explanatory variables.

   (b) Use the above contingency table to comment on the relationship between car accidents and using a cellphone while driving.

3. Suppose the probability of having a car accident is 0.05, and the probability of using a cellphone while driving is 0.1. Given a driver had a car accident, the probability that he/she was using a cellphone while driving is 0.3. If someone is using a cellphone while driving, what is the probability that he/she would have a car accident? Are these two events (car accident and using cellphone while driving) independent?

4. The sample mean and coefficient of variation (CV) for variable X are 5 and 1 respectively. We create a new variable, Y, by first subtracting 1 from X and then dividing the result by 2. What is CV for Y?

5. For two events E_1 and E_2, we have $P(E_1) = 0.3$ and $P(E_2) = 0.4$. Write down the following probabilities:

   (a) $P((E_1 \cap E_2)^c)$ if E_1 and E_2 are independent.

   (b) $P(E_1|E_2)$ if the two events are disjoint.

   (c) $P(E_1|E_2)$ if the two events are independent.