STATISTICS 402 - Assignment 1

Solution

1. Chapter 1 Review Exercises, pgs 34 – 36, # 3, 4, 6, 12, and 14

#3 a) chance error
b) bias
c) chance error

#4 a) False
b) False
c) True
d) True
e) True
f) False
g) False
h) Sort of true. For a random sample, each set of n individuals has the same chance of being the sample chosen as every other set of n individuals.

#6 a) You are more likely to catch bigger fish because they won't slip through the one-inch mesh. It is less likely that fish smaller than the 1 inch mesh net will be caught.
b) You will only get people who read the New York Times and of those only ones that tend to volunteer.
c) You are more likely to get bigger, isolated, trees. A small tree in the middle of a clump will have a very low chance of being chosen.

#12 a) What is the measurement? Shape of the sponge cell.
What are the conditions? White & Tip, White & Base, Green & Tip, Green & Base.
What are the experimental units? Sponges.

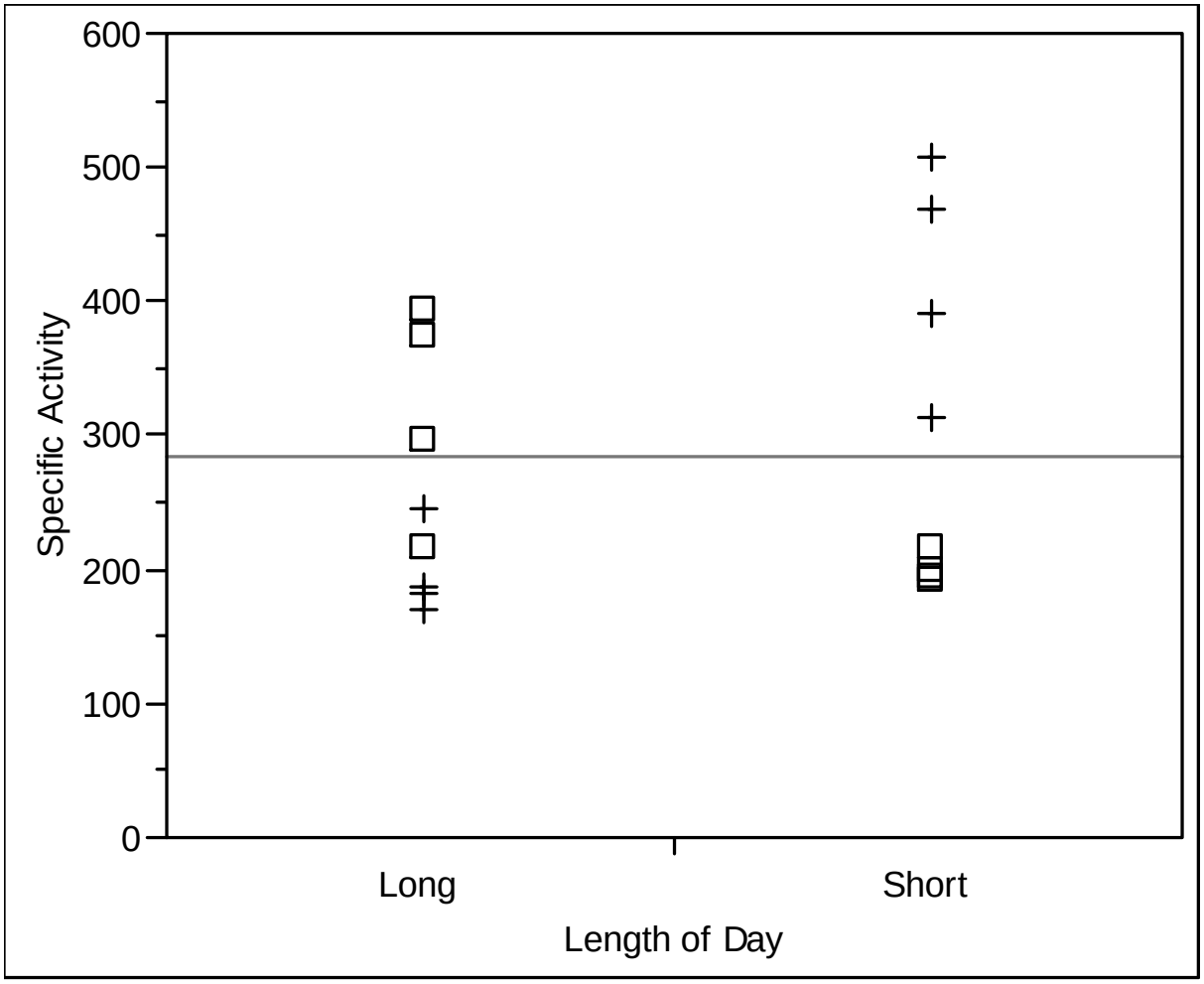
b) You have factorial crossing with sponge color as an observational factor and site as an experimental factor. Although the base and tip are part of each sponge the experimenter can randomly assign which sponges will have cells taken from the tip and which sponges will have cells taken from the base.

#14 a) Blocks are pairs of volunteers matched on the score on the pretest.
b) Blocks are individual volunteers.

2. Chapter 2, Review Exercises, pgs 57 – 58, # 1, 2, 3, and 4

   #1 The factor structure consists of: Organ as a factor of interest (Heart, Brain); Day Length as a factor of interest (Long, Short) and Hamster as a nuisance factor.

   #2 Plot of specific activity versus day length (+ Heart, □ Brain)



#3 Averages and ranges for the 4 combinations of Length of Day and Organ.

Average	Heart	Brain		**Range**	Heart	Brain
Long Day	**196**	**320**		Long Day	**77**	**178**
Short Day	**420**	**200**		Short Day	**194**	**24**

The ranges are quite different. The activity levels for the brain on short days are very consistent compared to the activity levels of hearts on short days. The average activity of

hearts on long days and brains on short days are quite similar, and low. The average activity of hearts on short days is much more than any other combination.

#4 The interaction plot appears below. The effect of shortening the day is to increase the specific activity of the heart but decrease the specific activity of the brain, on average.