Midterm II: Some problems for review

The exam will be taken in class (SCB 300/301) on Friday 3/20. You need to bring your laptop and pocket calculator (of any kind). You are not allowed to use any app on your laptop, even a calculator app. Your web browser should occupy the full screen at all time. Phones and notecard are not allowed. The instructor will provide scratched papers for you. When you are seated, go to Canvas and click on link for Midterm II on the home page. You will be directed to MyLab Math, which will ask you for an access code. The instructor will give you the access code.

Other exam policies:

The proctor may reassign your seat at the beginning or at any time during the exam.

Your laptop screen must be bright enough for the proctor to see your on-screen activities without difficulties.

Using a phone or any unauthorized assistance while the exam is in progress, whether inside or outside of the classroom, is prohibited.

If you need to leave the room for any reason, you must first obtain the proctor's permission. If the proctor is not present in the room and you want to leave, you must wait until he/she comes back. If you finish your exam, you must notify the proctor immediately. He/she will then ask you to log out of the exam and close your browser.

Violation of any of the above policies is considered as cheating and may result in a score of zero.

The textbook sections to be covered are 5A, 5C, 5D, 5E, 6A, 6B, 6C, 6D. You should review the homework problems, worksheets, quizzes, examples given in the lectures. It is always a good idea to study for the exam with someone.

The most important formulae, which you need to understand and memorize, are:

- Standard deviation of a data set:

$$std.dev. = \sqrt{\frac{(x_1-\bar{x})^2+(x_2-\bar{x})^2+\ldots+(x_n-\bar{x})^2}{n-1}} \quad \text{where} \quad \bar{x}=\frac{x_1+x_2+\cdots+x_n}{n}$$

- z-score of a data value:

$$z=\frac{data\ value\ -\ mean}{standard\ deviation}$$

Some problems to practice:

1) Identify the sampling methods (simple random sampling, systematic sampling, convenience sampling, cluster sampling, stratified sampling).

(a) An IRS auditor randomly selects for audits 30 taxpayers in each of the filing status categories: single, head of household, married filing jointly, and married filing separately.

(b) A magazine chooses its “25 best songs” of the year by looking at responses from readers who voluntarily mail in a survey printed in the magazine.

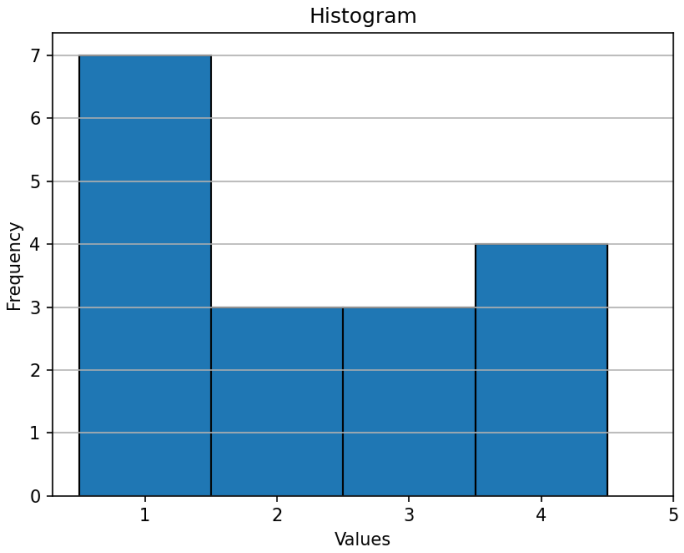
(c) A study of the use of antidepressants selects 50 participants between the ages of 20 and 29, 50 participants between the ages of 30 and 39, and 50 participants between the ages of 40 and 49.

(d) Every 100^{th} computer chip that is produced is given a reliability test.

(e) A computer randomly selects 400 names from a list of all registered voters. Those selected are surveyed to predict who will win the election for mayor.

(f) A taste test for chips and salsa is conducted at the entrance to a supermarket.

2) The histogram of a data set is given below.



(a) How many data are there in this data set? List all of them in ascending order.

(b) Construct a frequency table.

(c) Find the mean, median, and mode of the data set.

(d) Find the standard deviation of the data set.