Homework 7

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MAT 251: Probability and Mathematical Statistics

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Descriptive statistics

Exercise 1. Students in a History class have the following scores: 100, 98, 99, 88, 40, 88, 100, 50, 95, 88.
  (a) What is the mean of the scores?
  (b) What is the mode of the scores?
  (c) What is the range of the scores?
  (d) What is the median of the scores?
  (e) What is the standard deviation of the scores?

Exercise 2. If the mean of numbers 26, x, 45, 70 and 90 is 68, what is the mean of 20, 31, 45, 68, and x?

Exercise 3. How many students are in an exercise class if the average of all the participants weights is 60kg and the total of all the weights of the class participants is 800kg?

Exercise 4. Given the following frequency table (distribution) of scores, Which interval contains the median of the scores?

Score interval	Number of scores
90-100	3
80-89	4
70-79	7
60-69	5
50-59	2

Exercise 5. Given the following frequency table, find the mean, range, mode, median, standard deviation.

Value	Number of scores
55	1
54	2
50	10
60	5

Exercise 6. Let $X_1, X_2, \ldots, X_n$ be i.i.d with $X_i \sim N(3, 4)$. Set $\overline{X} = (X_1 + \cdots + X_n)/n$.
    (a) What is $E(\overline{X})$?
    (b) What is $\sigma_{\overline{X}}$?
    (c) What is the distribution of $\overline{X}$?
    (d) Compute $P(3.1 \leq \overline{X} \leq 5)$

Exercise 7. The following data shows prices of meal options at Bobs Burgers: $6 $7 $7 $8 $9 $14 $14 $14 $15 $15 $15 $15 $16 $16 $17.
    (a) Construct a histogram (frequency table) using bin ranges (classes) consisting of intervals of length 2.
    (b) Construct a histogram (frequency table) using 10 classes of equal size.