

ST 501/601 Assignment 5

Instruction

The assignment is due on **Sunday, October 13, 2024** at 11:59pm EDT. Please submit your assignment electronically through the **Moodle** webpage. **All problems**, unless stated otherwise, are from your textbook *Mathematical Statistics and Data Analysis* by John A. Rice. Therefore, when we write problem $x.y$ we meant problem y from chapter x of the textbook.

Problems List

- Problem 2.33
- Problem 2.37
- Problem 2.40
- Problem 2.43
- Problem 2.66
- Other Problem. The Rockwell hardness of a metal is determined by impressing a hardened point into the surface of the metal and then measuring the depth of penetration of the point. Suppose the Rockwell hardness of a particular alloy is normally distributed with mean 70 and standard deviation 3
 - a. If a specimen is acceptable only if its hardness is between 67 and 75, what is the probability that a randomly chosen specimen has an acceptable hardness?
 - b. If the acceptable range of hardness is $(70 - c, 70 + c)$, for what value of c would 95% of all specimens have acceptable hardness?
 - c. What is the probability that at most eight of ten independently selected specimens have a hardness of less than 73.84?