

Exercise 1 *A library has on its shelves 114 books on statistics. I took a random sample of 12 and want to test the hypothesis that the mean number of pages μ in all 114 books is 225 against the alternative that $\mu > 225$. The number of pages in the sample of 12 books were: 126 142 156 228 245 246 370 419 433 454 478 503*

Suppose the number of pages are normally distributed with standard deviation 200, and the rejection region is: $\bar{X} \geq 338$.

- (a) Calculate the Type I error of this testing procedure.
- (b) Suppose the true mean is 400. What is the power of the test procedure for detecting this departure from H_0 ?

Exercise 2 *The data in the table are simulated exam scores. Suppose the exam was given in the semester after the course content was revised, and previous median exam score was 70. Data:*

79 74 88 80 80 66 65 86 84 80 78 72 71 74 86 96 77 81 76 80 76 75
78 87 87 74 85 84 76 77 76 74 85 74 76 77 76 74 81 76

- (a) state the null and alternative hypothesis for test whether or not the median score has increased
- (b) calculate the p-value using the Binomial distribution
- (c) calculate the p-value using the normal approximation, and compare the result to part (b).