Suppose you have a random sample of size 15 from a continuous distribution. Express P(x0.05 < X10:15) in terms of the c.d.f. of an appropriate distribution.

In a random sample of 37 Salt Lake City residents, 30 of them prefer Diet Coke to regular Coke; the other 7 prefer regular Coke. Test the hypothesis that the proportion of residents that prefer Diet Coke is 1/3 using the sign test. Express the p-value in terms of an appropriate distribution.

Suppose you observe IQs of 77, 88, and 95 from a group of three subjects. Then, after taking NZT, the same three subjects get scores of 76, 90, and 100, respectively. The sample size is only three, so we shouldn’t expect a low p-value. Compute the p-value based the signed-rank test with a two-sided alternative.

Suppose you observe IQs of 77, 88, and 95 from a group that did not take NZT. Suppose you also observe IQs of 90 and 110 from a group that did take NZT. The sample size is only five, so we shouldn’t expect a low p-value. Compute the p-value based on a Wilcoxon rank-sum test with a two-sided alternative.

Suppose you observe IQs of 77, 88, and 95 from a group that did not take NZT. Suppose you also observe IQs of 90 and 110 from a group that did take NZT. Compute the p-value based on a randomization test with the difference of sample means as the test statistic (NZT – Placebo). Assume a two-sided alternative.