ICME Intro to Stats Summer Workshop

Section 4 Exercises

2023-07-24

1. Six different brands of Italian salad dressing were randomly selected at a supermarket. The grams of fat per serving are 7, 7, 9, 6, 8, 5. Assume that the underlying distribution is normal. Calculate a 95% confidence interval for the population mean grams of fat per serving of Italian salad dressing sold in supermarkets.

2. In the population, the average IQ is 100 with a standard deviation of 15. A team of scientists want to test a new medication to see if it has an effect on intelligence. A sample of 30 participants who have taken the medication has a mean of 140. Did the medication affect intelligence?

(a) Select an appropriate null hypothesis.

- A. H0 :iq_med = iq_pop
- B. H0 : iq_med < iq_pop
- C. H0 :iq_med > iq_pop
- D. H0 :iq_med $\neq$ iq_pop

(b) Select an appropriate alternative hypothesis.

- A. H1 :iq_med $\geq$ iq_pop
- B. H1 :iq_med < iq_pop
- C. H1 :iq_med = iq_pop
- D. H1 :iq_med $\neq$ iq_pop

(c) Calculate the test statistic. Assume equal variances.

(d) Calculate the p-value. You may refer to this Z Table

(e) At the 5% level of decision, should the null hypothesis be rejected?

3. A math exam was given to all the fifth grade children attending Country School. Two random samples of scores were taken. The null hypothesis is that the mean math scores for boys and girls in fifth grade are the same. Compute the p-value for a hypothesis test. You may refer to this T Table

	n	$\bar{x}$	s^2
Boys	55	82	29
Girls	60	86	46

Figure 1: Table