

1. Creative Writing Example – This data set comes from Section 1.1 of *The Statistical Sleuth*. In this study, the researcher wanted to explore the connection between motivation and creativity. **Do experienced creative writers show different levels of creativity based on the source of motivation for their writing, either intrinsic or extrinsic?** To answer this research question, a group of experienced creative writers was randomly assigned to one of two treatments. Both treatments involved giving the writers a questionnaire on motivation for writing. For one group of writers, the questionnaire asks about the intrinsic motivation for writing (enjoyment, satisfaction, etc.). For the other group of writers, the questionnaire asks about the extrinsic motivation for writing (jobs, financial rewards, awards, etc.). After completing the survey, all subjects were assigned to write a Haiku style poem on laughter. A group of 12 poets then scored these poems on a 40-point scale based on the creativity shown in the writing. The response variable is the average of evaluations by the 12 poets for each subject.

Creative Writing Study: Observed Data

Intrinsic:	12.0	12.0	12.9	13.6	16.6	17.2
	17.5	18.2	19.1	19.3	19.8	20.3
	20.5	20.6	21.3	21.6	22.1	22.2
	22.6	23.1	24.0	24.3	26.7	29.7
Extrinsic:	5.0	5.4	6.1	10.9	11.8	12.0
	12.3	14.8	15.0	16.8	17.2	17.2
	17.4	17.5	18.5	18.7	18.7	19.2
	19.5	20.7	21.2	22.1	24.0	

SAS code: **cwrite2.sas**

- a. Calculate the sample mean score for each treatment group. What is the difference in the two sample means?
 - b. What are the null and alternative hypotheses for the randomization test necessary to answer the research question?
 - c. Run the SAS code for the randomization test for these data and study the reference distribution for the difference in the sample means for the 10,000 random assignments of treatments to subjects. Describe the shape, center and variability of this distribution.
 - d. Locate the observed difference in the sample means from part (a) on the reference distribution. Given the observed difference in the sample means from part (a), what is the p-value for this randomization test?
 - e. Given a significance level of $\alpha = 0.05$, what is your answer to the research question?
 - f. What aspects of the data collection in this experiment would need special attention by the researcher?
2. Use what you have learned, do randomization test for the rat running data set using SAS.