UTSSRP - Causal Inference

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Question

(*Adapted from Box, Hunter, and Hunter) Fifteen judges were randomly allocated to judge one of two brands of beer, A or B, for taste. Eight judges will be assigned to Brand A and seven judges to brand B. The judges ranked the beer they tasted using a 10-point (Likert) scale with 1 representing 'poor taste' and 10 representing 'outstanding taste'.*

The table below shows the rating from each judge. The number in brackets beside the rating indicates which judge gave the rating. For example, judge 1 gave a rating of 2 to brand A, and judge 9 gave a rating of 3 to brand B. In this question you will evaluate if there is "causal" evidence that Brand B tastes better than Brand A.

Brand A	2 (1)	4 (2)	2 (3)	1 (4)	9 (5)	9 (6)	2 (7)	2 (10)
Brand B	8 (8)	3 (9)	5 (11)	3 (12)	7 (13)	7 (14)	4 (15)	

Answer the following questions using a programming language such as R or Python.

A. *What are the null and alternative hypotheses?*
B. *What are the experimental units? What are the treatments?*
C. *How many values does the randomization distribution of the difference in* ***median*** *ratings between the two brands contain?*
D. *Create a histogram of this randomization distribution.*

E. *Compute the P-value and interpret the P-value.*
F. *Is there* causal evidence *that brand B tastes better than Brand A? Explain.*