

Problem 1 (right tail test)

U.S. Plants	Japanese Plants
7.11% 8	3.52% 3
6.06% 6	2.02% 1
8.00% 9	4.91% 5
6.87% 7	3.22% 2
4.77% 4	
$T_1 = 34$	$T_2 = 11$

$n_1 = 5$
 $n_2 = 4$
 $\rightarrow n = 9$
 $\alpha = 0.05$
 Nonparametric Test: Wilcoxon Rank Sum Test

I.-

A.

Ho: The population distribution of turnover rates of US Plants and Japanese Plants are identical

Ha: The population Distribution of turnover rates of US Plants is shifted to the right of that of the Japanese Plants

Test Statistics: $T = T_2 = 11$

Rejection Region: $T_2 \leq T_L \rightarrow T_2 \leq 13$

Decision: Reject Ho at $\alpha=0.05$

Conclusion : There is enough evidence to conclude that the population distribution of turnover rates of US Plants is shifted to the right of that of Japanese Plants.

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B.

Ho: The population distribution of turnover rates of US Plants and Japanese Plants are identical

Ha: The population Distribution of turnover rates of US Plants is shifted either to the right or to the left of that of the Japanese Plants

Test Statistics: $T = T_2 = 11$

Rejection Region: $T \leq T_L$ or $T \geq T_U$
 $\rightarrow T \leq 12$ or $T \geq 28$

Decision: Reject Ho at $\alpha=0.05$

Conclusion : There is enough evidence to conclude that the population distribution of turnover rates of US Plants is shifted either to the right or to the left of that of Japanese Plants.

II.-

City	Corporate Lawyers	Lawyers with Law Firms
Atlanta	45,500	45,500
Chicago	43,000	48,000
Cincinnati	43,500	45,000
Dallas/Ft. Worth	49,500	46,500
Los Angeles	47,000	60,000
Milwaukee	37,500	50,000
Minneapolis/St. Paul	47,500	43,500
New York	43,500	54,000
Pittsburgh	42,000	44,000
San Francisco	47,500	59,500

Nonparametric Test: Wilcoxon Rank Sign Test

City	Corporate Lawyers	Lawyers with Law Firms	Differences	Abs(dif)	Ranks
Atlanta	45,500	45,500	0	0	ELIMINATED
Chicago	43,000	48,000	-5,000	5,000	5
Cincinnati	43,500	45,000	-1,500	1,500	1
Dallas/Ft. Worth	49,500	46,500	3,000	3,000	3
Los Angeles	47,000	60,000	-13,000	13,000	9
Milwaukee	37,500	50,000	-12,500	12,500	8
Minneapolis/St. Paul	47,500	43,500	4,000	4,000	4
New York	43,500	54,000	-10,500	10,500	6
Pittsburgh	42,000	44,000	-2,000	2,000	2
San Francisco	47,500	59,500	-12,000	12,000	7

$$n = 9$$

$$T_{+} = 7$$

$$T_{-} = 38$$

Ho: The population distribution of salaries of corporate lawyers and Law firm lawyers are identical
 Ha: The population Distribution of salaries of corporate lawyers is shifted to the right of that of the law firm lawyers

Test Statistics: $T = T_{-} = 38$

Rejection Region: $T \leq T_0 \rightarrow T \leq 8$

Decision: Fail to Reject Ho at $\alpha=0.05$

Conclusion : There is not enough evidence to conclude that the population distribution of salaries of corporate lawyers is shifted to the right of that of the law firm lawyers .

There is not enough evidence to conclude that the salaries of corporate lawyers tend to be greater than the salaries of law firm lawyers.

III.-

Short	Rank	Medium	Rank	Tall	Rank
10	1	24	3	68	14
27	5.5	27	5.5	71	15
26	4	35	7	57	10
39	8	44	9	60	12
22	2	58	11	62	13
$n_1 = 5$	$R_1 = 20.5$	$n_2 = 5$	$R_2 = 35.5$	$n_3 = 5$	$R_3 = 64$

$\rightarrow n = 15$

$\alpha = 0.05$

Nonparametric Test:
Kruskal Wallis H-Test

Ho: The three population distributions are identical
 Ha: At least two of the population distribution differ in location

Test Statistics:

$$H = \frac{12}{n(n+1)} \left[\sum \left(\frac{R_i^2}{n_i} \right) \right] - 3(n+1) = \frac{12}{15(15+1)} \left[\frac{20.5^2}{5} + \frac{35.5^2}{5} + \frac{64^2}{5} \right] - 3(15+1)$$

$$H = 9.765$$

Rejection Region: $H > 5.99147$

Decision: Reject Ho at $\alpha=0.05$

Conclusion : There is enough evidence to conclude that at least two of the population distribution differ in location; golfer's height influence the distance