University of Applied Sciences Cologne
Faculty of Economics, Business Administration and Law
Prof. Dr. Arrenberg
Room 221, Tel. 39 14
jutta.arrenberg@fh-koeln.de

Exercises Quantitative Methods

Worksheet: Compare Means

Exercise

Two different teams fit automatic doors in a car. On basis of a sample check the null hypothesis of no difference between the time of fitting in the two teams. We have stopped the following time (in minutes) for fitting:

Team 1	100 120 135 140 105 180 100 180 70
Team 2	150 105 135 125 130 125 105 125

Check the null hypothesis with the independent samples t-test.

Do the mean values of the variables X = “time for fitting (in min) of team 1“ and Y = “time for fitting (in min) of team 2“ differ?

University of Applied Sciences Cologne
Faculty of Economics, Business Administration and Law
Prof. Dr. Arrenberg
Room 221, Tel. 39 14
jutta.arrenberg@fh-koeln.de

Exercises Quantitative Methods

Worksheet: Compare Means

Exercise 5.1 Anderson et. al page 354
Suppose independent random samples of 15 unionized women and 20 non-unionized women in a skilled manufacturing job provide the following hourly wage rates (€).

Union Workers

22.40	18.90	16.70	14.05	16.20	20.00	16.10	16.30	19.10	16.50
18.50	19.80	17.00	14.30	17.20					

Non-union Workers

17.60	14.40	16.60	15.00	17.65	15.00	17.55	13.30	11.20	15.90
19.20	11.85	16.65	15.20	15.30	17.00	15.10	14.30	13.90	14.50

Does there appear to be any difference in the mean wage rate for these two groups? Explain.

Exercise 5.2 Berenson et. al page 422
You want to determine whether the mean weekly sales of BLK cola are the same when using a normal shelf location and when using an end-aisle display. The first sample contains the weekly sales of BLK cola from 10 stores selected to use the normal shelf location, and the second sample contains the weekly sales of BLK cola from the 10 stores selected to use the end-aisle display. The following table contains the cola sales (in number of cases) for the two samples:

Display Location

Normal Display					End-Aisle Display				
22	34	52	62	30	52	71	76	54	67
40	64	84	56	59	83	66	90	77	84

Please determine whether the mean weekly sales of BLK cola are the same when using a normal shelf location and when using an end-aisle display.

Exercise 5.3 Berenson et. al page 441
Can students save money by comparison shopping for textbooks at Amazon.com? To investigate this possibility, a random sample of 15 textbooks used during Spring 2007 semester at Miami University was selected. The prices for these textbooks at both local bookstore and through Amazon.com were recorded. The prices for the textbooks are given below:

Book Name	Book Store	Amazon
Principles of Microeconomics	120.00	101.22
Calculus: Early Transcendentals	137.50	115.33
Exploring Wine	65.00	37.05
Manual de Grammatica	82.75	71.36
Deviant Behavior	90.00	83.00
Modern Architecture Since 1900	39.95	26.37
Rise of Christianity	40.00	26.40
Commercial Banking	120.00	108.99
A Romance of a Republic	25.00	14.99
Chemistry in Context	133.75	102.30
Universal Principles of Design	40.00	26.40
In Mixed Company	79.50	68.76
International Marketing	154.75	126.15
Russia $ Western Civilization	30.95	31.95
Enterprise Information Systems	155.75	126.97

At the 0.05 level of significance, is there evidence of a difference between the mean price of textbooks at the local book store and Amazon.com?

Exercise 5.4 Berenson et. al page 441
A newspaper article discussed the opening of a Whole Foods Market in the Time-Warner building in New York City. The following data compared the prices of some kitchen staples at the new Whole Foods Market and the Fairway supermarket located about 15 blocks from Time-Warner building:

Item	Whole Foods	Fairway
Half-gallon milk	2.19	1.35
Dozen eggs	2.39	1.69
Tropicana orange juice (64 oz.)	2.00	2.49
Head of Boston lettuce	1.98	1.29
Ground round, 1 lb.	4.99	3.69
Bumble Bee tuna, 6 oz. can	1.79	1.33
Granny Smith apples (1 lb.)	1.69	1.49
Box DeCecco linguini	1.99	1.59
Salmon steak, 1 lb.	7.99	5.99
Whole chicken, per pound	2.19	1.49

At the 0.05 level of significance, is there evidence that the mean price is higher at Whole Foods Market than at Fairway supermarket?