



Two-Way ANOVA analysis on apparent temperatures for various wind speeds and humidity levels

This dataset contains real feel temperatures recorded in various environmental conditions. We will analyze the real feel temperatures for various wind speeds and humidity levels.

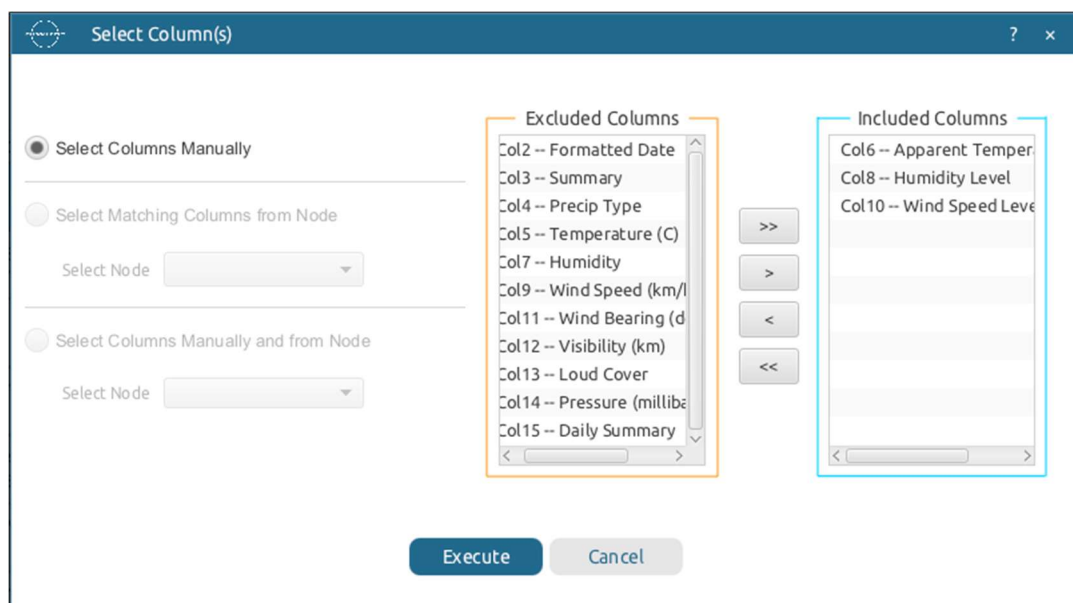
The variables examined are Apparent Temperature as a dependent variable and Wind Speed, Humidity as factors. The dataset is modified to be used for Two-Way ANOVA

Isalos version used: 2.1.2

Dataset: <https://www.kaggle.com/datasets/budincsevit/szeged-weather>

Step 1: Data preparation

Import dataset and rename the tab to "Data". Go to Data Transformation → Data Manipulation → Select Column(s), transfer "Col6 – Apparent Temperature", "Col8 – Humidity Level", "Col10 – Wind Speed Level" to the "Included Columns" and click "Execute"



	Col1	Col2 (D)	Col3 (S)	Col4 (S)
User Header	User Row ID	Apparent Temperature (C)	Humidity Level	Wind Speed Level
1		7.3888889	High	High
2		7.2277778	Mid	High
3		9.3777778	High	Low
4		5.9444444	Mid	High
5		6.9777778	Mid	Mid
6		7.1111111	Mid	High
7		5.5222222	High	Mid
8		6.5277778	High	High
9		10.8222222	Mid	Mid
10		13.7722222	Mid	High
11		16.0166667	Low	High
12		17.1444444	Low	High
13		17.8000000	Low	High
14		17.3333333	Low	High
15		18.8777778	Low	High
16		18.9111111	Low	Mid
17		15.3888889	Low	High
18		15.5500000	Low	Mid
19		14.2555556	Mid	Mid
20		13.1444444	Mid	Mid
21		11.55	Mid	Mid
22		11.1833333	Mid	Low

Step 2: Full Two-Way ANOVA

Create a new tab named “Interaction” and import the spreadsheet from the “Data” tab. To perform the analysis, go to **Statistics → Analysis of (Co)Variance → Two-Way ANOVA** and select “Humidity Level” as **Factor A**, “Wind Speed Level” as **Factor B**, “Apparent Temperature” as **Response Variable** and click **Execute**

Two Way ANOVA

Factor A

Col3 -- Humidity Level

Factor B

Col4 -- Wind Speed Level

Response Variable

Col2 -- Apparent Temper...

Execute

Cancel

The results are shown in the right spreadsheet:

	Col1	Col2 (S)	Col3 (I)	Col4 (D)	Col5 (D)	Col6 (D)	Col7 (D)
User Header	User Row ID	Source	DF	Adj SS	Adj MS	F-value	P-value
1		Factor A: Humidity Level	2	3385557.3660624	1692778.6830312	21991.5665350	0.0
2		Factor B: Wind Speed Level	2	25409.3575896	12704.6787948	165.0515757	0.0
3		Interaction: Humidity Level * Wind Speed Level	4	222173.6498820	55543.4124705	721.5867397	0.0
4		Error	95903	7382036.8267415	76.9739928		
5		Total	95911	11015177.2002754			

Step 3: Main Effects Two-Way ANOVA

Create a new tab named “Main Effects” and import the spreadsheet from the “Data” tab. To perform the analysis, go to Statistics → Analysis of (Co)Variance → Factorial ANOVA and enter “95” in Confidence Level (%), select “Apparent Temperature” as Dependent Variable, move all columns to Factors, select Main Effects and click Execute

Factorial ANOVA

Confidence Level (%) 95

Dependent Variable Col2 -- Apparent Te...

Sum of Squares for Tests Adjusted (Type III)

Coding for Factors (-1, 0, +1)

Excluded Columns

Factors
Col3 -- Humidity Level
Col4 -- Wind Speed Level

Formula Type: ☐ Custom ☒ Main Effects ☐ Full Factorial

Formula: Humidity Level + Wind Speed Level

Execute Cancel

The results are shown in the right spreadsheet:

	Col1	Col2 (S)	Col3 (I)	Col4 (D)	Col5 (D)	Col6 (D)	Col7 (D)	Col8 (S)
User Header	User Row ID	Source	DF	Adj SS	Adj MS	F-Value	P-Value	Significant
1		Humidity Level	2	3612240.9197485	1806120.4598742	23479.3578871	0.0	Yes
2		Wind Speed Level	2	252092.9112759	126046.4556379	1638.5894009	0.0	Yes
3		Error	95907	7377526.9229371	76.9237587			
4		Total	95911	11015177.2002754				

Final Isalos Workflow:

