

4. Weather

The weather data of a winter day are available in the text file *idoadat.txt*; it is tagged by tabs and has UTF-8 encoding. The measurements were carried out at Kékestető every hour starting from midnight, therefore the data of a total of 24 hours are available. Perform the analysis of the measured data according to the description and the example using a worksheet processor.

During the solution take the followings into consideration.

- *Whenever possible, use a formula, function or reference in the solution.*
 - *There are parts in the exercise that use the results from a previous question. If you could not solve the previous part completely, use its solution as it is, or instead of a formula resulting in a number enter “10”, instead of a formula resulting in a text enter “day-time” and work on with this value, because this way you can receive marks for these exercise parts.*
1. Import the data from file *idoadat.txt* and then save it as *idojaras* in the default format of the worksheet processor.
 2. Insert a column before the first column. The heading of the column should be “Time of measurement”.
 3. The weather characteristics that appear in the table were measured every full hour. The first measurement took place at 0 o’clock. Fill the first column based on this information. The number format of the times should be the same as in the example.
 4. For the measured data of wind speed and atmospheric pressure units “km/h” and “hPa” should be displayed respectively, in accordance with the example; the units should be separated from the data by one space. The values of humidity should be displayed in percent format.
 5. In the corresponding cells of row 32, determine the average temperature, the average wind speed, the average atmospheric pressure and the average humidity for the given day. The average values should be displayed to two decimal places, with units that correspond to the given category.
 6. Calculate how atmospheric pressure changed in each hour during the day. In order to do so, from 1:00 o’clock determine the increase in atmospheric pressure with respect to the value that was measured one hour earlier and enter it into the *Change in atmospheric pressure* column. The format of the calculated data should be the same as the one set for atmospheric pressure values.
 7. In the *Part of the day* column display expressions “night-time” and “day-time” with a function that can be copied flawlessly depending on whether the given measurement was performed in the day-time or in the night-time. Day-time lasts from sunrise to sunset (including the limiting times). The time of sunrise and sunset can be found before the measured data.
 8. In the corresponding cells of column *G*, determine the daily temperature range (the difference of the highest and lowest temperatures measured) and the mean night-time and day-time temperatures. (You are advised to use the values calculated in column *Part of the day* for this.) Display two decimal places for the mean values. If required, you can use an auxiliary table in columns *K*, *L*.
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9. On the worksheet that contains the table create a chart that shows the temperature histogram at every hour according to the followings. Choose a chart type where each data point is displayed. Further characteristics of the chart are:
- The title of the diagram should be “Temperature measured in degrees Celsius”.
 - On the value axis the scaling should range from -6 to +6 degrees Celsius with a step of one degree.
 - The chart should not have a legend.
 - The labels of the horizontal axis (the times) should be displayed below the chart.
 - Choose the size of the chart and the axis labels so that the times are readable horizontally.
 - In order to determine the values belonging to the individual times easily, display vertical gridlines
10. Format the table according to the example.

30 marks

Example:

1	A	B	C	D	E	F	G	H	I
	5 February 2007, Kékestető								
2						Daily temperature range (degrees Celsius):	8		
3		Sunrise:	7:01			Mean night-time temperature (degrees Celsius):	-1,87		
4		Sunset:	16:48			Mean day-time temperature (degrees Celsius):	1,78		
5									
6	Time of measurement	Weather type	Temperature (degrees Celsius)	Wind direction (degrees)	Wind speed	Atmospheric pressure	Humidity	Change in barometric pressure	Part of the day
7	0:00	bright	-4	284	8 km/h	1 027 hPa	82%		night-time
8	1:00	bright	-4	331	8 km/h	1 026 hPa	81%	-1 hPa	night-time
9	2:00	bright	-4	328	12 km/h	1 025 hPa	89%	-1 hPa	night-time
10	3:00	bright	-3	322	13 km/h	1 024 hPa	88%	-1 hPa	night-time
11	4:00	bright	-3	318	13 km/h	1 023 hPa	87%	-1 hPa	night-time
12	5:00	mostly c	-3		12 km/h	1 021 hPa	86%	-1 hPa	night-time