Free University of Bolzano Bozen – Faculty of Economics and Management

Information Systems and Data Management 27006 mid-term

# Rules

* + No communication with other people or among students is allowed. Portable communication devices must be turned off. Opening any communication program on the computer is not allowed and is considered cheating.
  + You are responsible for the correct copy of your files.

Enter Windows with your login. You have 28 minutes starting from now.

Copy all the files in **\\ubz01fst.unibz.it\Courses\exam\_coletti\YOURNAME** on your Desktop. At the end of the exam copy here only the files you are required to return, overwriting the original files you have modified.

## Exercise Excel

File **petrolstations.xlsx** contains data on 2700 Italian petrol stations. Open it with Microsoft Excel 2016, clicking on Enable Content, and in sheet **List**

* format column K as number with 1 decimal digit and thousand separator;
* format column J applying a 3-colours scale background, starting from green for small values, then yellow and finishing with red for large values;
* in column Q calculate the square root of column M;
* in column R display East whenever **Longitude** is larger than 12 and West otherwise;
* in column S build a date with day equal to 1, with month extracted from column B and as year the year before the current year (we know it is 2016, but it must be calculated automatically);
* in column T calculate the probability to have a value smaller than the ratio **DieselCars** / **GasolineCars** from a normal distribution with μ=0.5 and σ2=4.

In a new sheet

* calculate the average of **GDPprocapita** for petrol stations with **Longitude** above 40. Calculate the average of **GDPprocapita** for petrol stations with **Longitude** below 40;
* calculate the six different yearly payments for the six mortgage loans of 250 000 € with 2.5% interest to be paid back in 5, 10, 15, 20, 25, 30 years respectively. Hint: result for 5 years is -53 811.72.

My company makes shirts and coats. A shirt requires 1 hour of cutting and 5 hours of sewing. A coat requires 4 hours of cutting and 3 hours of sewing. There are a maximum of 28 hours of labor in the cutting department each day and 55 hours in the sewing department. The maximum number of shirts that can be produced is two more than the number of coats. Each shirt produces 26€ in profit and each coat 57€ in profit. In a new sheet find the number of shirts and coats to produce the maximum profit.

Build a VBA function called **howMany** which receives as input a range of cells and a text and returns the count of the rows in the range when the text is R, the count of the columns when it is C and the count of the cells otherwise.

## Save and return:

* **petrolstations.xlsm** (or **petrolstations.xlsx** if you have not done VBA exercise)

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## Exercise Excel

File **petrolstations.xlsx** contains data on 2700 Italian petrol stations. Open it with Microsoft Excel 2016, clicking on Enable Content, and in sheet **List**

* format column K as number with no decimal digit and with thousand separator;
* freeze the top row and the first two columns;
* in column Q insert the date in column B advanced by a number of days equals to **Latitude** rounded to no decimal digits.

In a new sheet

* calculate the average of **Size** for petrol stations with **Size** above 3 000. Calculate the average of **Size** for petrol stations with **Size** below 3 000;
* calculate the standard deviation of Size.

Consider a debt of 1000 € which can be paid back with two yearly payments of 550 € or it can be paid back with four yearly payments of 280 €. Build the two cash flows tables. Using an entire new sheet, produce a mathematical graph, displaying the two lines of the net present values by discount, with discount rate from 0.5% to 15%.

Sheet **Scenario** displays the data on a concert’s organization. Pink cells contain values which can be changed. Set up a scenario manager in which you insert the starting values and other 3 scenarios modifying the pink cells as you wish. Build a scenario summary sheet using yellow cells as results.

Build a VBA function called **countProv** which receives as input a range **R** of cells and a text called **Prov**. The function goes through the range of cells and counts how many cells of **R** contain the text in **Prov**, considering any possible capitalization. Then the function returns the ratio between this count and the total number of cells in the range **R**.

## Save and return:

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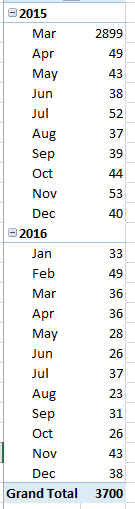
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Enter Windows with your login. You have 24 minutes starting from now.

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## Exercise Excel

File **petrolstations.xlsx** contains data on 2700 Italian petrol stations. Open it with Microsoft Excel 2016, clicking on Enable Content, and in sheet **List**

* in column Q insert the logarithm in base 2 of **Size**;
* in column R display “holiday” whenever **Start** is on Saturday or Sunday, “working day” otherwise;
* in column S display “holiday” if **Start** is on Saturday or Sunday or on Christmas (day is 25 and month December), “working day” otherwise;
* in column T calculate the probability to have a value smaller than the ratio **DieselCars** / **GasolineCars** from a normal distribution with μ=0.5 and σ=4.
* Using columns A:P from sheet List, build in a new sheet a pivot table like the one in the picture displaying the number of petrol station per Start’s year and month (not per quarter!).

In a new sheet

* calculate the three averages of **Population** for petrol stations of the three **Type**: Highway, Main road, Other;
* calculate, without building the mortgage loan’s table, the ten interests, from year 1 to year 10, due for a mortgage loan of 200 000 € paid back in 10 years with interest rate 2%.

In sheet **Pie**

* build a pie chart of **Type** and **Size**, with percentages and with **Services** slice taken out from the pie.

Build a VBA function called **howMany** which receives as input a range of cells **R** and an optional text **T** with default value “BZ”. It returns the count of the cells in the range **R** which contain the text **T**.

## Save and return:

* **petrolstations.xlsm** (or **petrolstations.xlsx** if you have not done VBA exercise)