



**UNIVERSITÀ
DEGLI STUDI
DI BERGAMO**

Dipartimento
di Ingegneria Gestionale,
dell'Informazione e della Produzione

Projects and exam guidelines

**DATA SCIENCE AND
AUTOMATION COURSE**

**MASTER DEGREE SMART
TECHNOLOGY ENGINEERING**

TEACHER

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Project guidelines

The available projects contain:

1. The dataset (in various formats)
2. A general description of the data and the objective of the analysis
3. Eventually, further materials such as papers, documentation, etc...



Project guidelines

1. Understand how to import the dataset
2. Try to solve the proposed objective (by your own). This is just an indication, you can choose your own analysis aim and answer your own questions based on the data
3. Try the most appropriate techniques studied, maybe multiple of them
4. Start with a data exploration:
 - What are the distribution (histograms) of the variables?
 - There are missing data?
 - Can you plot and visualize the data?
 - Can you find clusters? Can you visualize them?
5. Use regularization and cross-validation to tune the hyperparameters.
6. Evaluate and test the model



Project guidelines

Final report

1. You will present a power-point presentation like an oral exam
2. Describe your analysis process and steps
3. For each step, show and interpret the results
4. For each step, describe the code and the libraries that you used. Why those choices?

Code

1. You have to send the code some days before the presentation



Project guidelines

The project will be evaluated by:

1. How well you will **present** the report (data visualization and results presentation is important)
2. How **good is the developed solution**, in terms of:
 - Quality of the code (technical and documentation aspects)
 - Usage of collaborative platforms or versioning (ex. Git, github)
 - Data analysis aspects (interesting visualization, findings, answers,...)
 - Originality of the analysis steps
 - Your knowledge and understanding of what you have done
 - How you solved a technical problem (ex. Libraries, pre-processing steps, difficulty of the dataset and tasky)



Exam

The exam consists of:

- 1. A written (oral) exam (max 25 points).** Subscribe with your university account. You will pass the written exam if you obtain ≥ 15 points. It will consist of:
 - Theory open questions on all the programs
 - An exercise on the industrial automation part
- 2. Oral project presentation (max 6 points – not mandatory).** You will describe your work using a presentation.
 - The **evaluation lasts 1 year**
 - The date for the presentation has to be decided with the teacher. No **more than 1 week after the written exam**

