

Alma Mater Studiorum - University of Bologna  
LM Informatica  
**Data Analytics Project**

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# Chapter 1

## Introduction

In this report we will discuss about the whole data pipeline of a project that uses different techniques of machine learning to classify some tabular data. In particular, we choose the first project proposal that aims to predict the average mark of a film from its features. The first step of the data pipeline requires to download, save and load in memory the MovieLens [1], TMDb [2] and IMDb [3] datasets. Consequently, the datasets were elaborated with the objective to generate a unified dataset that can be used as an input for some machine learning algorithms. Afterwards, during the modelling phase we built an MLP model thanks to the PyTorch framework [4]. In addition, we used other techniques like SVM, tree methods and naive bayes methods that are available into the Scikit-Learn library [5]. In order to find a good configuration during the performance analysis, it was mandatory to define a large enough hyperparameters space for all the models that we defined. Moreover, in the last phase, the cross validation technique was used which resulted in more robust statistics that has been compared between the trained models.



## Chapter 2

# Methodology

In the next chapter there will be the explanation of the data pipeline that the project followed. In particular, each subsection will focus on a specific phase of this pipeline, except for the data visualization, that has been used only when needed.

### 2.1 Data Acquisition

The used datasets are downloaded at run-time directly from the sources. These datasets came from directly from MovieLens' page, which provides 6 different dataset that are:

- ratings.csv
- tags.csv
- movies.csv
- links.csv
- genome-scores.csv and genome-tags.csv

where the most of these datasets provides information for approximately 60000 samples. Since the links dataset provides an identifier to the IMDB and TMDB databases it has been possible to gather more information from these external sources through its API[?][?].

### 2.2 Data Pre-process

### 2.3 Modeling

### 2.4 Performance Analysis





# Bibliography

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