

CMP4336 – Introduction to Data Mining

Homework 1

Deadline: August 24, 2020 till 23:59 (strict deadline, no extension!)

The dataset given in the following link consists of 45211 instances.

<https://archive.ics.uci.edu/ml/datasets/Bank+Marketing>

Write a program that performs the following tasks on the above-mentioned dataset:

- 1) Replace the missing values using one of the methods we have discussed in the lecture hour.
- 2) Calculate the mean, standard deviation, mode, and skewness of all numerical attributes and report them.
- 3) Find the mode of each categorical variable.
- 4) Plot the probability density function of numerical variables and histogram of categorical variables.
- 5) Using y (has the client subscribed a term deposit?) attribute as the class variable, plot the scatter plots of each pair of numerical attributes.
- 6) Compute the distance matrix using Euclidean distance. The size of the distance matrix will $N \times N$ where N is the number of samples in the dataset and include the distances between each pair of samples.
- 7) Compute the distance matrix using Mahalanobis distance. The size of the distance matrix will $N \times N$ where N is the number of samples in the dataset and include the distances between each pair of samples.
- 8) Choose one of the discretization methods we have discussed in the lecture and discretize all numerical attributes using that method.

Guidelines

1. Use Python.
2. Submit **a single pdf** file which includes the **required output for each of the tasks given above** and the **source code** you have written. Submissions that include more than one pdf file will **NOT** be evaluated.
3. Submission will be made through itslearning, NOT e-mail.