**Pattern Recognition Project**

The objective of the projects is to prepare you to apply different machine learning algorithms to real-world tasks. This will help you to increase your knowledge about the workflow of the machine learning tasks. You will learn how to clean your data, applying pre-processing, feature engineering, regression, and classification methods. Each project will be delivered in milestones.

➢ The best three teams will get Bonus .

➢ Teams that Apply new techniques will get Bonus .

➢ Registration ends: 08/05/2021 11:59 PM .

➢ Delivering Milestone 1: To Be Announced.

➢ Delivering Milestone 2: Practical exam.

➢ Minimum number of members is 3 and the maximum is 6.

➢ You must deliver a detailed report for each milestone contains all your work (feature analysis, algorithms used in each module and the achieved accuracy for each one)

**Note :** Each report will be graded

In the second milestone, you will apply the followings :-

**Classification :** Apply different classification techniques (at least four) to find the model that fit your data with maximum accuracy.

1

**Milestone 2:**

➢ Classification

**Milestone 2 Report Must Include:**

❖ You must explain in detail the **preprocessing techniques** you needed to apply on your dataset and how you implemented them.

❖ Perform **analysis** on the dataset as studied and explain how the features affect and relate to each other.

❖ You must explain what **classification techniques** you used (at least four). ❖ Mention the **differences** between each model and the acquired **results** (accuracy/error and so on).

❖ You must clearly mention **what features** you used or discarded to create your classification models.

❖ Explain what the **sizes** of your training, testing and validation sets are, if exist.

❖ Mention any further techniques that were used to **improve** the results (if exist).

❖ You should include **screenshots** of the resultant(s) Accuracy.

❖ Finally, write a **conclusion** about this phase of the project and what intuition you had about your problem and how it was proved/disproved.

2

**Project : Predicting Hypermarket Type**

**Dataset Snapshots:**

**Table

Description automatically generated**

**Dataset Description:**

|  |  |
| --- | --- |
| **Feature** | **Description** |
| X1 | Item ID |
| X2 | Weight of Item |
| X3 | Amount of Fats in Item ( low fat or regular ) |
| X4 | The % of display area allocated for item in store |
| X5 | Item Category |
| X6 | Item Price |
| X7 | Store ID |
| X8 | Store Establishment Year |
| X9 | Store Size |
| X10 | Store Location Type (Type of City) |
| Y | Label (Store Location) |

**Milestone 2 tasks:**

1. Apply pre-processing on the provided dataset.

2. Experiment with classification techniques to increase accuracy on prediction of the store type (Deliver at least four techniques).

3. plot the accuracy of different models compared to each other .