Universidade Federal de Uberlândia

PGC308A Tópicos Especiais em Sistemas de Computação 2: Internet do Futuro

Rodrigo Moreira – moreira_r@outlook.com

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1 Task III: Estimating SLA Conformance and Violation from Device Statistics

1. Model Training - provide the coefficients of your model C:

   Coefficients of the model C:
   Θ_1 = **-5.67750597e-02** Θ_2 = **-4.26722323e-02**
   Θ_3 = **6.32365126e-03** Θ_4 = **-4.57938573e-07**
   Θ_5 = **3.52435923e-03** Θ_6 = **3.03572012e-04**
   Θ_7 = **-8.26688033e-02** Θ_8 = **-7.17041206e-02**
   Θ_9 = **-7.46929691e-06**

2. Accuracy of the Classifier C:

   Classification Error (ERR) - Logistic Regression-based ≈ 0.114, i.e. $\approx 11,4\%$.

3. Accuracy of the Classifier C (by considering the Naïve method):

   Classification Error (ERR) - Naive-based ≈ 0.495, i.e. $\approx 49.5\%$.

4. New classifier extending the linear regression:

   Classification Error (ERR) - New Classifier (Linear Regression-based) ≈ 0.121, i.e. $\approx 12.1\%$.

5. Observations and conclusions based on the above work:

   The confusion matrix allows visualization of classifier performance. Allowing to check the number of correct classifications as opposed to the classifications predicted for each class. To the resolutions of the questions raised, it is possible to conclude that the accuracy of the classifier using Logistic Regression is sufficiently better than using a Naïve approach. In addition, it is possible to conclude that the accuracy, measured by the metrics (ERR) when using learning-based on Linear Regression as the learning engine for the classifier, we obtain results numerically lower then Logistic Regression. Thus, it is possible to conclude that using the Logistic Regression approach will allow higher classification rates considering the engines proposed for the classifiers.

The codes used to solve these questions are available in the following link: https://github.com/romoreira/MLN/blob/master/Main_Task_III.py

The Figure 1 depicts the output of execution of our Python Script.

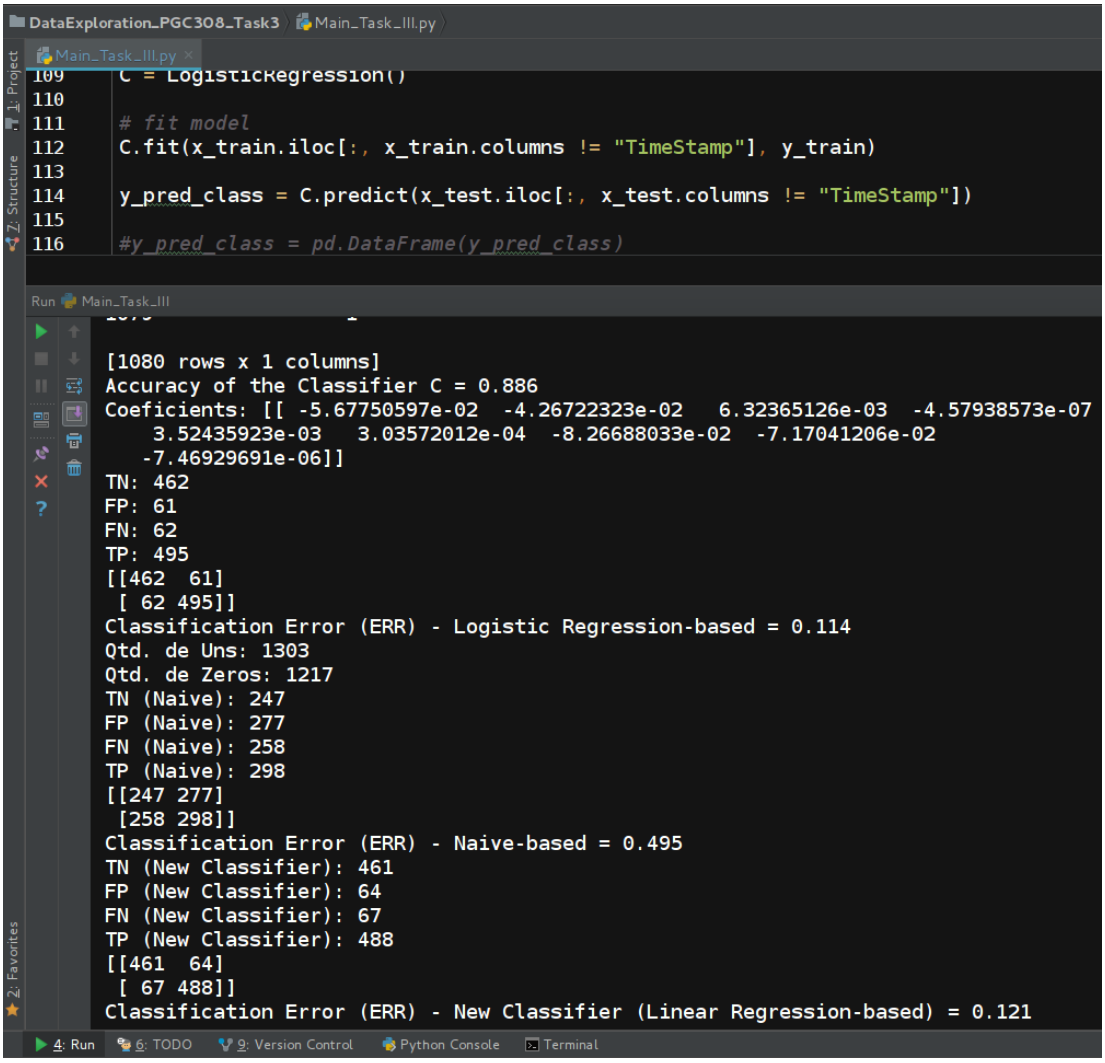

Figure 1: Console Output – Pycharm IntelliJ