ML Project Proposal

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1 Proposal

For this project we are proposing to use a dataset from the UCI Machine Learning Repository[1] which contains data about patients with diabetes disease in order to predict if they will be readmitted in some hospital after they have been discharged. The reason is that prior knowledge of future readmission will allow us to change the treatment in order to avoid it (and possibly improve patient's future health).

In this database, we have 3 different outputs:

- No readmission.
- A readmission in less than 30 days (this situation is not good, because maybe your treatment was not appropriate).
- A readmission in more than 30 days (this one is not so good as well the last one, however, the reason can be the state of the patient.

The dataset represents 10 years (1999-2008) of clinical care at 130 US hospitals and integrated delivery networks. It includes over 50 features representing patient and hospital outcomes. Information was extracted from the database for encounters that satisfied some specific criteria (such as a diabetes of encounter, administered medications, length of the stay, etc). The data contains such attributes as patient number, race, gender, age, admission type, time in hospital, medical specialty of admitting physician, number of lab test performed, HbA1c test result, diagnosis, number of medication, diabetic medications, number of outpatient, inpatient, and emergency visits in the year before the hospitalization, etc.

In total we have:

- Number of rows: 100.000
- Number of columns: 51 (including response variable)
  - Numeric variables: 11
  - Categorical: 40 (2 of them binary, 1 with 3 levels, 2 with 4 levels, and the rest with more than 5 levels).

Our proposed title is ***Predicting readmission risk in diabetic patients through previous hospital ingress indicators***.

2 Previous work

References to previous works can be found in

- *Beata Strack, Jonathan P. DeShazo, Chris Gennings, Juan L. Olmo, Sebastian Ventura, Krzysztof J. Cios, John N. Clore, "Impact of HbA1c Measurement on Hospital Readmission Rates: Analysis of 70,000 Clinical Database Patient Records", BioMed Research International, vol. 2014, Article ID 781670, 11 pages, 2014. https://doi.org/10.1155/2014/781670.*
- *https://www.hcup-us.ahrq.gov/reports/statbriefs/sb153.jsp.*
- *https://www.hcup-us.ahrq.gov/reports/statbriefs/sb154.jsp.*

[1] https://archive.ics.uci.edu/ml/datasets/Diabetes+130-US+hospitals+for+years+1999-2008