UNIVERSITY OF SINDH

STUDENT GRADE PRIDICTION

Project report

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Project report

Introduction

In this Case, we analyze how various machine learning models perform in predicting the final grade in a course. For example, we consider various attributes such as test scores, attendance and tardiness in collecting the data. We also demonstrate that PCA is not a good method for feature extraction.

Description

The goal of this project was to provide students with a way to make easy, accurate predictions about their grades. This can be done by simply looking at their previous grades and comparing them to the grade they need to get in order to pass. For example, if you have a 3.0 GPA and want an A- in your class, you can look at your GPA and see that it's about .8 points below that for an A-. If your GPA is really low, or if it's really high, these numbers are going to change—but they'll still give you a good idea of whether or not you can pass.

Technical background

Language: PYTHON.

Libraries: NUMPY, SEABORN, METPLOTLIB, PANDAS.

Model: sklearn.model.Selection, sklearn.linear_model

Algorithms: Regression.

DATA SET

There are 33 columns:

school: student's school (binary: 'GP' - Gabriel Pereira or 'MS' - Mousinho da Silveira)

sex: student's sex (binary: 'F' - female or 'M' – male.

age: student's age (numeric: from 15 to 22)

address: student's home address type (binary: 'U' - urban or 'R' - rural)

famsize: family size (binary: 'LE3' - less or equal to 3 or 'GT3' - greater than 3)

Pstatus: parent's cohabitation status (binary: 'T' - living together or 'A' - apart)

Medu: mother's education (numeric: 0 - none, 1 - primary education (4th grade), 2 â€" 5th to 9th grade, 3 â€" secondary education or 4 â€" higher education)

Fedu: father's education (numeric: 0 - none, 1 - primary education (4th grade), 2 â€" 5th to 9th grade, 3 â€" secondary education or 4 â€" higher education)

Mjob: mother's job (nominal: 'teacher', 'health' care related, civil 'services' (e.g. administrative or police), 'at_home' or 'other')

Fjob: father's job (nominal: 'teacher', 'health' care related, civil 'services' (e.g. administrative or police), 'at_home' or 'other')

reason: reason to choose this school (nominal: close to 'home', school 'reputation', 'course' preference or 'other')

guardian: student's guardian (nominal: 'mother', 'father' or 'other')

traveltime: home to school travel time (numeric: 1 - <15 min., 2 - 15 to 30 min., 3 - 30 min. to 1 hour, or 4 - >1 hour)

studytime: weekly study time (numeric: 1 - <2 hours, 2 - 2 to 5 hours, 3 - 5 to 10 hours, or 4 - >10 hours)

failures: number of past class failures (numeric: n if 1<=n<3, else 4)

schoolsup: extra educational support (binary: yes or no)

famsup: family educational support (binary: yes or no)

paid: extra paid classes within the course subject (Math or Portuguese) (binary: yes or no)

activities: extra-curricular activities (binary: yes or no)

nursery: attended nursery school (binary: yes or no)

higher: wants to take higher education (binary: yes or no)

internet: Internet access at home (binary: yes or no)

romantic: with a romantic relationship (binary: yes or no)

famrel: quality of family relationships (numeric: from 1 - very bad to 5 - excellent)

freetime: free time after school (numeric: from 1 - very low to 5 - very high)

go out: going out with friends (numeric: from 1 - very low to 5 - very high)
Dalch: workday alcohol consumption (numeric: from 1 - very low to 5 - very high)

Walch: weekend alcohol consumption (numeric: from 1 - very low to 5 - very high)

health: current health status (numeric: from 1 - very bad to 5 - very good)

absences: number of school absences (numeric: from 0 to 93)

G1: first period grade (numeric: from 0 to 20)

G2: second period grade (numeric: from 0 to 20)

G3: final grade (numeric: from 0 to 20)