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To predicting patient information at emergency unit using multiple regerssion algorithm

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ABSTRACT

Healthcare has always been considered as one of the most important determinant in improving the quality of life and preserving health of human beings around the whole world. However, millions of people have to put up with inaccurate medical care services due to lacking of experienced doctors, especially in the developing countries and areas. Meanwhile, the clinical treatment decision support systems are leveraged to help physicians choose appropriate clinical treatments. Recently there have been many researches focusing on providing clinical treatment advice on patients with single disease, but in reality there exist many patients suffering from co-existing medical conditions.

Our system can help physicians find appropriate medical treatments for patients in some complicated conditions. We proposed multiple regressions is an extension of simple linear regression. It is used when we want to predict the value of a variable based on the value of two or more other variables. The variable we want to predict is called the dependent variable (or sometimes, the outcome, target or criterion variable). The variables we are using to predict the value of the dependent variable are called the independent variables (or sometimes, the predictor, explanatory or regressor variables).

Keywords: *Improving the Quality Of Life, We Proposed Multiple Regressions Method, Value of the Dependent Variable,*

INTRODUCTION

Emergency department (ED) crowding can have serious negative consequences for patients and staff, such as increased wait time, ambulance diversion, reduced staff morale, adverse patient outcomes such as increased mortality, and cancellation of elective procedures. Previous research has shown ED crowding to be a significant international problem, making it crucial that innovative steps are taken to address the problem. There are a range of possible causes of ED crowding depending on the context, with some of the main reasons including increased ED attendances, inappropriate attendances, a lack of alternative treatment options, a lack of inpatient beds, ED staffing shortages, and closure of other local ED departments. The most significant of these causes is the inability to transfer patients to an inpatient bed, making it critical for hospitals to manage patient flow and understand capacity and demand for inpatient beds [1-5].

One mechanism that could help to reduce ED crowding and improve patient flow is the use of data mining to identify patients at high risk of an inpatient admission, therefore allowing measures to be taken to avoid bottlenecks in the system. For example, a model that can accurately predict

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hospital admissions could be used for inpatient bed management, staff planning and to facilitate specialized work streams within the ED. Such a model could be developed using data mining techniques, which involves examining and analyzing data to extract useful information and knowledge on which decisions can be taken. This typically involves describing and identifying patterns in data and making predictions based on past patterns [6-10].

PROPOSED SYSTEM

The performance of EDs has been a particular issue for the Northern Ireland healthcare sector in recent years. EDs in Northern Ireland have been facing pressure from an increase in demand which has been accompanied by adverse levels of performance across the region compared to some other. The patient then waits for a target time of less than fifteen minutes before triage by a specialist nurse. This study draws on this data to achieve two objectives. The first is to create a model that accurately predicts admission to hospital from the ED department, and the second is to evaluate the performance of multiple regressions algorithms in predicting hospital admissions. We also suggest use cases for the implementation of the model as a decision support and performance management tool.

ADVANTAGES

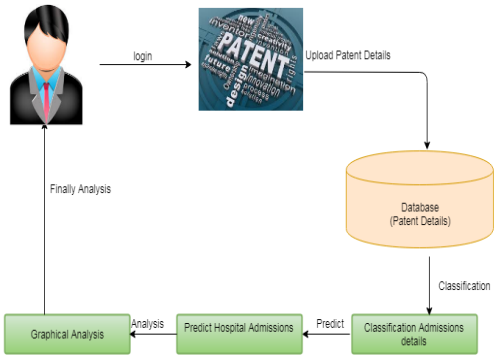
- Levels of performance.
- The use of historical data.
- Itself to predict future events.
- Forecasts further into the future.

METHODOLOGY

Multiple Regression Method

Multiple regressions is an extension of simple linear regression. It is used when we want to predict the value of a variable based on the value of two or more other variables. The variable we want to predict is called the dependent variable (or sometimes, the outcome, target or criterion variable). The variables we are using to predict the value of the dependent variable are called the independent variables (or sometimes, the predictor, explanatory or regressor variables). For example, you could use multiple regression to understand whether exam performance can be predicted based on revision time, test anxiety, lecture attendance and gender. Alternately, you could use multiple regression to understand whether daily cigarette consumption can be predicted based on smoking duration, age when started smoking, smoker type, income and gender.

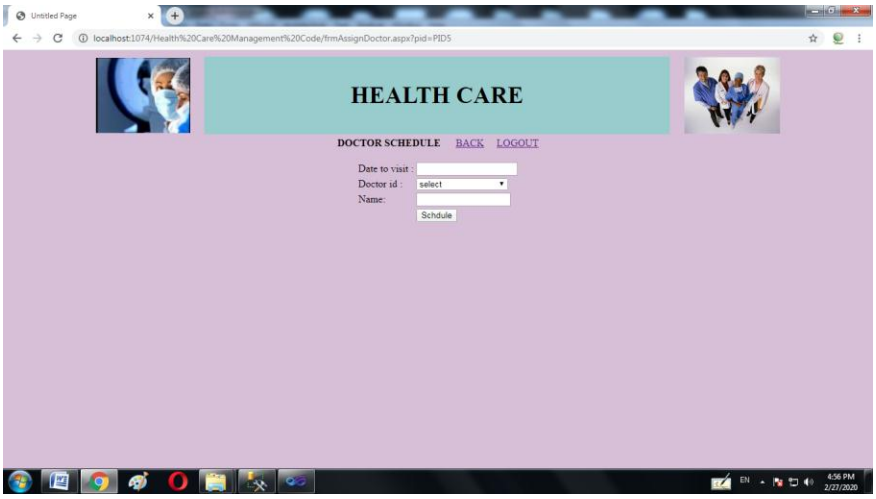
SYSTEM MODEL



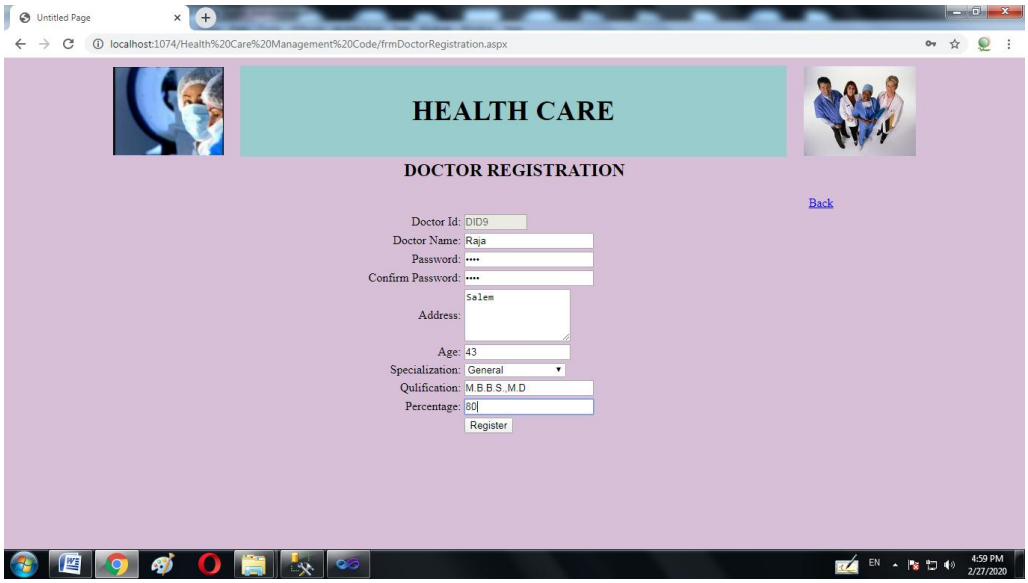
RESULT AND DISCUSSION

Admin Login

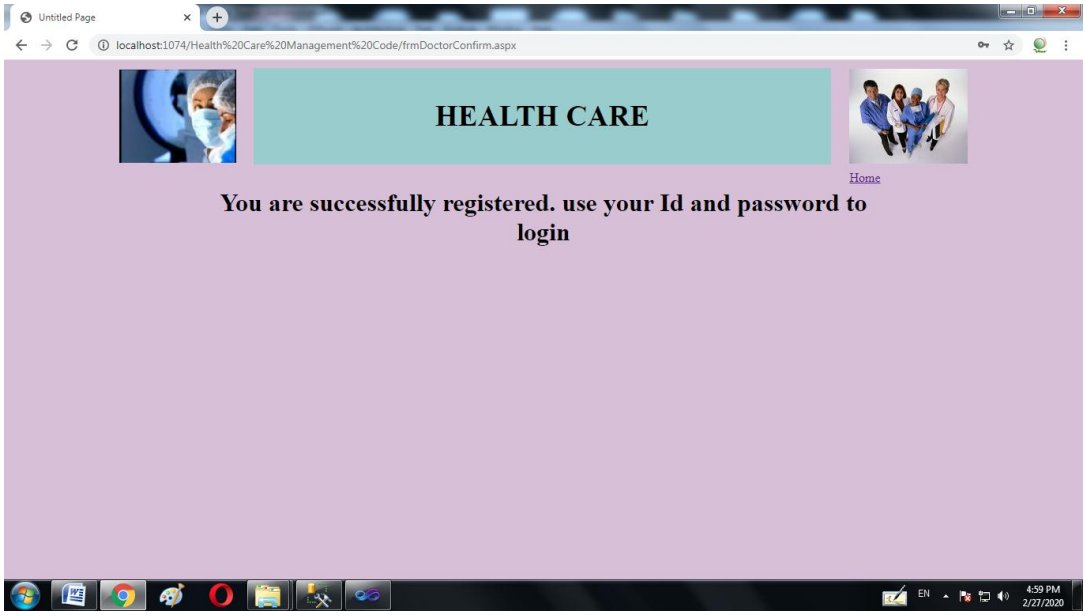
Doctor Schedule



Doctor Registration



Login output page



CONCLUSION

This study involved the development and comparison of three machine learning models aimed at predicting hospital admissions from the ED. Each model was trained using routinely collected ED data using three different data mining algorithms, namely logistic regression, decision trees and gradient boosted machines. Overall, the GBM performed the best when compared to logistic regression and decision trees, but the decision tree and logistic regression also performed well. The three models presented in this study yield comparable, and in some cases improved performance compared to models presented in other studies.

Implementation of the models as a decision support tool could help hospital decision makers to

more effectively plan and manage resources based on the expected patient inflow from the ED. This could help to improve patient flow and reduce ED crowding, therefore reducing the adverse effects of ED crowding and improving patient satisfaction. The models also have potential application in performance monitoring and audit by comparing predicted admissions against actual admissions. However, whilst the model could be used to support planning and decision making, individual level admission decisions still require clinical judgment.

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