COVID-19 PREDICTION WITH BLOOD PRESSURE USING MACHINE LEARNING

Dr. M. RAJESWARI[1],
Assistant Professor,
Department of B.Com(A&F and BA),
PSGR Krishnammal College for Women, Coimbatore, India.
rajeshwarim@psgrkcw.ac.in

U. R. NETHRA SHRI[2],
UG Scholar,
Department of B.Com(Business Analytics),
PSGR Krishnammal College for Women, Coimbatore, India.
nethrashriuvarajan@gmail.com

ABSTRACT

The new infection named COVID-19 is influencing many individuals everywhere in the world. Most of the patients will experience mild to moderate respiratory disease and recover without requiring any treatment infected with the COVID-19 virus. Aged persons, and persons with underlying medical issues like disorder , diabetes, chronic respiratory illness , and cancer are more likely to develop serious illness. We have proof that Machine Learning (ML) application on the past pestilence sickness energizes analysts by giving another point to battle against the novel Corona infection episode. This work plans to completely survey the job of Machine Learning as one critical strategy in the field of screening, foreseeing, determining, contact following, and medication advancement for COVID-19.

Keywords: COVID-19, Machine Learning, blood pressure

I. INTRODUCTION

Machine Learning(ML) is the study that gives the ability for the computers to learn algorithms by experience. It is one of the most fascinating technologies that one would have ever come across. The development of computer programs were they can access data are focused mainly by ML that can be used for their own study. Data mining and Bayesian analysis were made more popular than ever due to resurging interest in machine learning.

II. OBJECTIVE

The pressure of the blood within the arteries is commonly referred to as blood pressure. It is produced initially by the contraction of the heart muscle. Its measurement is recorded by 2 numbers. High blood pressure is a serious condition. The latest evidence shows that folks with uncontrolled or untreated high vital signs could also be in danger of getting severely ill with COVID-19. It's also important to note that people with untreated high signs seem to be more in peril of complications from COVID-19 than those whose high signs are managed with medication.

III. RELATED WORK

Predictive computing tools are increasingly getting used and have demonstrated successfulness in providing insights which will cause better health policy and management. However, as these technologies are still in their infancy stages, slow progress is being made in their adoption for serious consideration at national and international policy levels[10].

Bio-surveillance is the science of early detection and prevention of a disease outbreak in the community [2]. Analytics, machine learning, and natural language processing (NLP) are being increasingly used in bio-surveillance [5,1]. Scanning social media, news reports, and other online data are often used to detect localized disease outbreaks before they even reach the extent of pandemics [Al] Early case identification, quarantining, and preventing exposure to the communities are crucial pillars in managing a black death like COVID-19.Especially in quarantined populations, mobile phone-based surveys are often useful in predicting the cases, [7,9].

AI and ML research groups across all the countries are extensively working to tackle various aspects of the COVID-19 testing time including epidemiological, molecular studies and drug development medical, and socio-economical applications.[6]

For the Covid-19 pandemic, the ongoing development in AI and ML has significantly improved treatment, medication, screening, prediction, forecasting, contact tracing, and vaccine development process and reduce the human stake in medical practice. However, most of the models are not deployed enough to show their real-world operation, but they are still up to the mark to tackle the SARS-CoV-2 epidemic.[8]

AI is employed for drug research by analysing the available data on COVID-19. It is useful for drug\vaccine delivery design and development. This technology is employed in speeding up drug testing in real-time, where standard testing takes plenty of time and hence helps to accelerate this process significantly, which may not be possible by a human [3, 4].

IV. METHODOLOGY

A. DATA MINING

Data mining is the process of identification of anomalies, patterns and correlations within large datasets to predict results. Using a broad range of techniques, you'll use this information to extend revenues, cut costs, improve customer relationships, reduce risks and more.

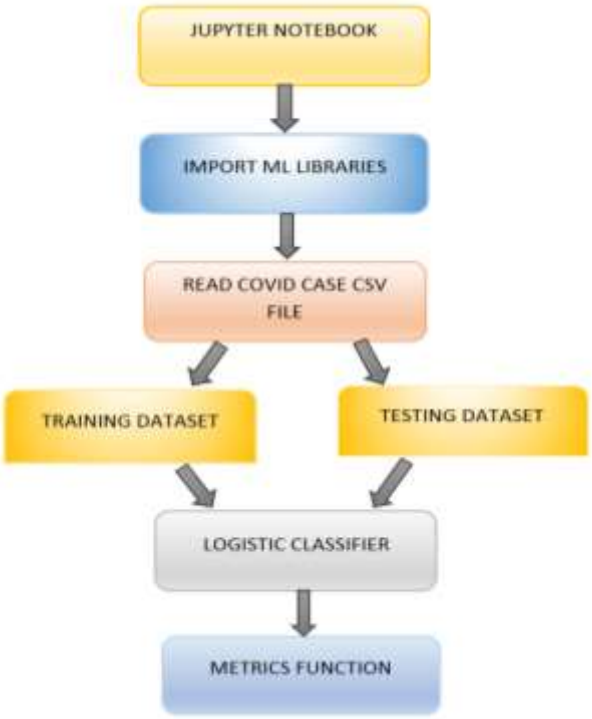
Machine learning automatically develops through data-based experience that has an algorithm. It is how to seek out a replacement algorithm from experience. Data Mining and Machine learning are areas that are influenced by one another , although they need many common things, yet they need different ends.

B. LOGISTIC REGRESSION

Logistic regression is a classification algorithm but will not assign attributes to a discrete set of classes. Logistic regression uses a function named logistic sigmoid to transform its outcomes to return a probability percentage which can then be mapped to 2 or more discrete classes. Steps for implementing Logistic Regression are:

- ➔ Step 1: Create a dataset and import necessary packages
- ➔ Step 2: Split the dataset into Test and Training datasets
  Training set- a subset to train a model
  Test set- a subset to test the trained model
- ➔ Step 3: Visualize the dataset and obtain metrics score for the set of labels predicted for a sample to exactly match the corresponding set of labels
- ➔ Step 4: Build the logistic regression model and identify the probability percentage

C. FLOW CHART



V. RESULT

Fig: 4.1

sns.counterplot() method is used to show the counts of observations in each categorical bin using bars.(fig: 4.1)

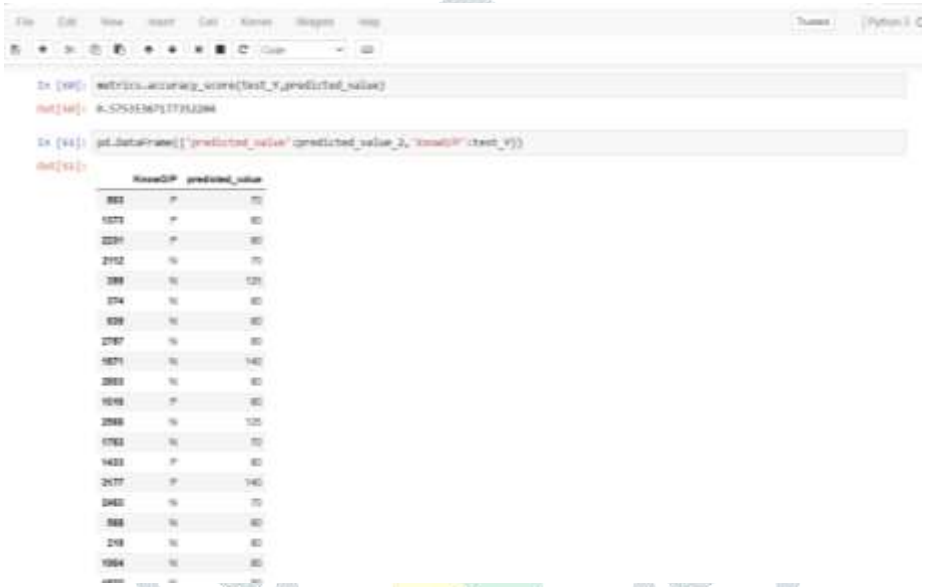


Fig: 4.2

Out of all study participants, 29.5 percent had high vital signs . Of these with high signs , 83.5 percent were taking medications to manage their condition. There was a twofold increase within the danger of death because of COVID-19 in people with high signs as compared to those without high signs. The result of accuracy score is 57% (fig: 4.2) which represents that 57 percent of the patients who are affected with high blood pressure have the chances to get affected by COVID 19.

VI. CONCLUSION AND FURTHER WORK

This paper incorporates the analysis made on the COVID Case Details dataset. It is based on how people are affected by COVID-19 related to blood pressure and identifies the percentage of probability. This prediction was possible using the tool Jupyter Notebook. Coronavirus can damage the heart directly, which can be especially risky if your heart is already weakened by the effects of high blood pressure. The virus may cause inflammation of the heart muscle called myocarditis, which makes it harder for the heart to pump. These findings can provide help by creating awareness to the society and reduce the number of positive cases.

REFERENCE:

1. Al-Garadi MA, Khan MS, Varathan KD, Mujtaba G, Al-Kabsi AM. Using online social networks to track a pandemic: A systematic review. J. Biomed. Inform. 2016;62:1–11.

2. Allen KC. Chapter 13 – Applications: Biosurveillance, biodefense, and biotechnology. In: Horney JA, editor. Disaster epidemiology [Internet]. Academic Press; 2018 [cited 2020 Mar 29]. P. 143–51.

3. Biswas K, Sen P. Space-time dependence of coronavirus (COVID-19) outbreak. arXiv preprint arXiv:2003.03149. 2020 Mar 6.

4. Haleem A., Vaishya R., Javaid M., Khan I.H. Artificial Intelligence (AI) applications in orthopaedics: an innovative technology to embrace. J Clin Orthop Trauma. 2019 doi: 10.1016/j.jcot.2019.06.012.

5. Jalal A. Analytics, Machine Learning & NLP – use in BioSurveillance and Public Health practice. Online J Public Health Inform [Internet]. 2015 May 7 [cited 2020 Mar 29];7(1).

6. Khalid Raza Big Data Analytics and Artificial Intelligence Against COVID-19: Innovation Vision and Approach, 165-176, 2020.

7. Rao ASRS, Vazquez JA. Identification of COVID-19 Can be quicker through artificial intelligence framework using a mobile phone-based survey in the populations when cities/towns are under quarantine. Infect. Control Hosp. Epidemiol. 2020 Mar 3;1–18.

8. Samuel Lalmuanawma, Jamal Hussain, Lalrinfela Chhakchhuak Chaos, Solitons & Fractals, 110059, 2020.

9. Toninelli D, Toninelli D, Pinter R, Pedraza P de, Pinter R, Pedraza P de. Mobile research methods. Ubiquity press [Internet]. 2015 Sep 25 [cited 2020 Mar 29]

10. Zaheer Allam, Gourav Dey, David S Jones AI 1 (2), 156-165, 2020