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Machine Learning-based Linear regression way to deal with making data science model for checking the sufficiency of night curfew in Maharashtra, India

Subham Panda[1], Ayan Kumar Ghosh[1], Anup Das[2], Uttam Dey[3], Subir Gupta[1]
[1]Department of Master of Computer Application, Dr. B. C. Roy Engineering College, Durgapur, West Bengal – 713206, India
[2]CEO and founder of AnupTechTips
[3]Department of APC, Dr. B. C. Roy Engineering College, Durgapur, West Bengal – 713206, India

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ABSTRACT

The birthplace of the novel Covid-19 sickness or COVID-19 began its spread around Wuhan city, China. The spread of this novel infection sickness began toward the start of December 2019. The Covid-19 illness spreads from one individual to another through hacking, sniffling, etc. To stop the spreading of the novel Covid-19 infection the distinctive nation has presented diverse strategies. Some regularly utilized methods are lockdown, night curfew, etc. The fundamental intention of the systems was to stop the social events and leaving homes without serious issues. Utilizing a diverse system Covid-19 first stage can address for saving individuals. Presently the second influx of this novel Covid illness has begun its top from the mid of April-May. The second convergence of this novel Covid disorder flooded all through the world and in India too. To stop the spread of this novel Covid sickness India's richest state Maharashtra government constrained the decision of night curfew. In this paper, we are taking as a relevant examination the night curfew on a schedule of Maharashtra. Here, we study that this system may or may not be able to stop the spread of pandemics.
We are using the Machine learning(ML) approach to managing regulate study this case. ML has various systems yet among all of those here we use Linear Regression for the current circumstance. The reproduced insight that readies the plan orchestrated to learn with no other person. Linear Regression is the affirmed strategy for looking over the connection between two sections. Between the two segments, one is astute and another is a seen variable.

Corresponding Author:

Dr. Subir Gupta*
Department of MCA
Durgapur, West Bengal –713206, India
E-Mail: subir2276@gmail.com
ORCID ID: 0000000209410749

1. INTRODUCTION

Coronavirus or the novel Covid has been verbalized as a pandemic in the significant segment of 2020 by the World Health Organization[1][2]. It took the lives of more than 1.3 million individuals in any spot of the world. India has an overall population of around one-fifth of the hard and fast individuals and is named as a second driving country in the record of everybody. By and large, the total of the nations of the world saw the essential mixing of Coronavirus which happened during spring and every little development, thus, expanded its rate all through the pre-summer[3]. In any case, the subsequent wave began its stun close to the beginning of 2021. As shown by various papers open throughout the activity, several assessments that element plan

evaluation and inspecting for the Indian region. The appraisals on the Indian locale present expanded length and transient models, uninhibitedly.

Machine Learning is the method for information assessment that prepares the machine to see models and settle on choices without a human check[4][5]. Reenacted knowledge is a piece of man-made reasoning. Dataset masterminding is the treatment of contributing the unpleasant information so we can go through AI assessments to check our central evaluation[6]. In present-day AI play the principal part in many exploration areas like material science, picture handling, climate gauging, bio-clinical designing, etc.[4][7]. AI can be partition into 3 classes: Supervised Machine Learning, Unsupervised Machine Learning, and Reinforcement Learning[8].

Linear Regression is a machine learning calculation subject to supervised learning. It plays out an apostatize task. Lose the faith models target guess respect subject to self-overseeing factors[9][10]. It is overall utilized for discovering the relationship among elements and choosing. Diverse apostatize models contrast subject to – such a relationship among reliant and independent parts, they are pondering and the number of free factors being utilized[11][12].

Appropriately, this examination tries to work on the critical appraisal of night curfew on a schedule of Maharashtra how prepared to stop the spread of pandemics using linear regression of machine learning approaches.

2. RESEARCH METHOD

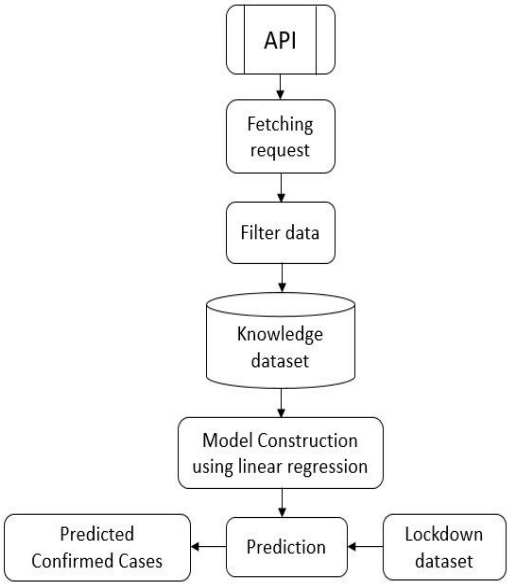

Figure 1. Data Flow Diagram

For any assessment, the dataset is required. In fig 1 we clarify how we aggregate the dataset comparably as channel the dataset. For this specific assessment, we gather our illuminating variety of government APIs[13]. The data that we get from the API is in tons[13]. By then, we channel the data and build up our knowledge dataset, which contains the attempted cases and the announced cases. With an aggregate of 332 days datasets, we are built to set up our model. In Table 1 example dataset for preparing has appeared. Our knowledge dataset is export to the preparation model. The planning model intends to use Linear Regression computations of machine learning. The essential state of Liner backslides shows up in equation 1[14].

$$L(t)=1/(1+e-t) \quad \text{where}$$
$$t = a+bx \qquad (1)$$

Where the condition passed on the coefficient 0.1354 and the intercept value is 183152.5861 as per the readied dataset using machine learning.

Utilizing the linear regression statistical strategy we got the anticipated information according to as far as anyone is concerned dataset[15]. On, the other hand we have the night check-in time plan as pronounced by the Maharashtrian Government[16]. From there, we can close the viability of the night curfew in Maharashtra

Table 1. Representing the sample dataset

Date	Confirmed	Tested
05-01-2020	11506	144159
05-02-2020	12296	151085
05-03-2020	12974	159754
05-04-2020	14541	168374
05-05-2020	15525	175323
05-06-2020	16758	181746
05-07-2020	17974	189220
05-08-2020	19063	200477
05-09-2020	20228	210174
05-10-2020	22171	225524
05-11-2020	23401	218914
05-12-2020	24427	222284
05-13-2020	25922	231061
05-14-2020	27524	240482

3. RESULTS AND DISCUSSIONS

Our fundamental goal to test night curfew how important to stop the spread of Covid-19 in the subsequent stage. For this situation study, we were viewed as the Maharashtra, India informational collection from 28th march,2021 to 20th April 2021[16]. In Figure 2 and Figure 3 we are showing the line chart and Histogram of real information and predicted information. From both the figure it is noticeable night curfew are not in a situation to quit spreading of Coronavirus. For more precise examination we go for hypothetical testing utilizing a t-test because the number of test dates is just 24[17].

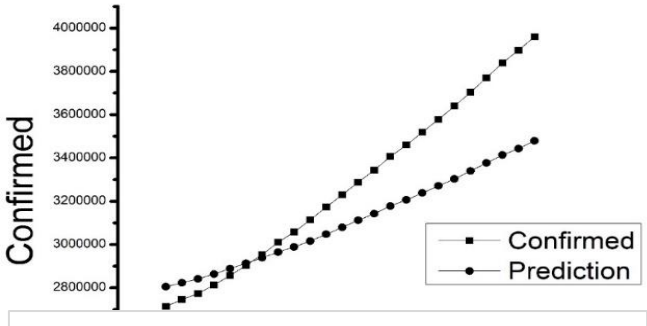

Figure 2. Chart of confirmed and predicted cases

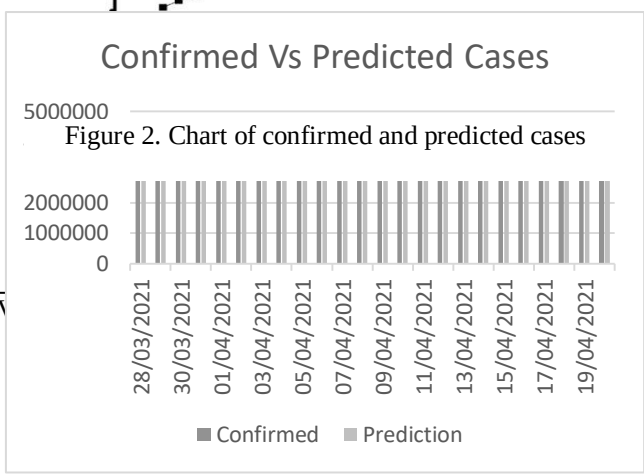

Figure 3. Histogram of predicted and confirmed cases

A t-test is such a speculative estimation used to choose whether there is a basic qualification between two techniques or groups. Calculating a t-test requires three key data regards, specifically the mean distinction, the standard deviation, and the quantity of data potential gains of each gathering[18]. Various types of t-test can be performed for assessment. Here we consider the Two-Sample t-test[19].
Hypothetical assumption[20]:
H0: null hypothesis μpredict <= μobserve,
i.e., both the means are very closed or equal. This states that night curfew has a significant effect
H1: Alternative hypothesis μpredict > μobserbve,
i.e., μ1 > μ2 which states that night curfew does not affect.
We tested this hypothetical concept through t-Test: Paired Two Sample for Means[21].

Confirmed
N1: 24
df1 = N - 1 = 24 - 1 = 23
M1: 3281350.83
SS1: 3578227069187.33
s21 = SS1/ (N - 1) = 3578227069187.33/ (24-1) = 155575089964.67
Prediction
N2: 24
df2 = N - 1 = 24 - 1 = 23
M2: 3111482.17
SS2: 1034154733297.33
s22 = SS2/ (N - 1) = 1034154733297.33/ (24-1) = 44963249273.8
T-value Calculation
s2p = ((df1/ (df1 + df2)) * s21) + ((df2/ (df2 + df2)) * s22) = ((23/46) * 155575089964.67) + ((23/46) * 44963249273.8) = 100269169619.23
s2M1 = s2p/N1 = 100269169619.23/24 = 4177882067.47
s2M2 = s2p/N2 = 100269169619.23/24 = 4177882067.47
t = (M1 - M2)/√ (s2M1 + s2M2) = 169868.67/√8355764134.94 = 1.86
The t-value is 1.85832. The p-value is .06953. The result is not significant at p <0 .05
According to our computation, the null hypothesis dismissed, and the alternative hypothesis is chosen i.e., the night curfew of Maharashtra doesn't influence stop the spread of Covid-19.

4. CONCLUSION

According to our factual investigation utilizing machine learning and data science model, it tends to be asserted night curfew of Maharashtra doesn't impact stop the spread of Covid-19. And yet, it should be

viewed as that for this situation study we think about just tried cases and affirmed cases and utilizing linear regression calculations. Numerous different boundaries like the celebration, the thickness of populace, etc. possibly consider. For tending to more boundaries higher machine learning approach like ANN, Deep Learning, and so forth is required. In the current investigation, it very well may be affirmed that with a 5% degree of importance just night curfew is certainly not an adequate condition to stop the expenditure of the Coronavirus second stage.

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BIOGRAPHIES OF AUTHORS

	Subham Panda Department of MCA Dr. B.C Roy Engineering College Durgapur, West Bengal –713206, India E-Mail: subhampanda543@gmail.com
	Ayan Kumar Ghosh Department of MCA Dr. B.C Roy Engineering College Durgapur, West Bengal –713206, India E-Mail: ayanghosh63@gmail.com
	Anup Das CEO and Founder AnupTechTips New Jalpaiguri, West Bengal –734007, India E-Mail: anup.das17@yahoo.com
	Uttam Dey Department of APC Dr. B.C Roy Engineering College E-Mail: deyuttam0@gmail.com
	Dr. Subir Gupta* Department of MCA Durgapur, West Bengal –713206, India E-Mail: subir2276@gmail.com *Corresponding Author