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Palestine Radar Model (PRM) for Predicting the Number of Infected Cases of COVID-19 Virus in Palestine

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Abstract

In the light of the COVID-19 virus pandemic that has attacked the earth planet, all nations in the world are becoming suffered more and more from the increasing number of infected cases. The medical infrastructure in most countries aren?t fit to deal with such pandemic, hospitals in these countries are unable to accommodate a such number of the infected cases that have recently been recorded [1], [5]. This pandemic has put countries in a great predicament; they never expected to face a pandemic of this size [1], [5]. Palestine is one of these pandemic victims, COVID-19 virus has started spreading in Palestine on fifth March of 2020 [4]. Palestinian government and leadership have announced immediately by its Prime Minister Dr Mohammad Shtayyeh the case of emergency in Palestine to prevent this dangerous pandemic from spreading, by closing all schools and universities, crowding prevention, limiting motion and asking people strongly for home-stay [1], [2], [4].

Index terms— COVID-19 pandemic, palestine radar model, PRM, linear prediction, forecast function

Abstract-In the light of the COVID-19 virus pandemic that has attacked the earth planet, all nations in the world are becoming suffered more and more from the increasing number of infected cases. The medical infrastructure in most countries aren't fit to deal with such pandemic, hospitals in these countries are unable to accommodate a such number of the infected cases that have recently been recorded [1], **??**5]. This pandemic has put countries in a great predicament; they never expected to face a pandemic of this size By applying the previous actions and decisions from the Palestine government and leadership, the safety of people and society will be increased as far as the more commitment and discipline from them.

1 Study Methodology

This study is theoretical and experimental research; it uses the linear prediction technique in the Microsoft Office Excel program by using the (Forecast Function) that is included in the statistical category of Microsoft Office Excel program library [9], [11]. In the Microsoft Office Excel Program, there are two familiar methods to implement the linear prediction, which are [9], [11], [12]: a) Using the (Forecast) statistical function

Here, the linear prediction will be implemented directly. Since the (Forecast) statistical function is readily available in the Microsoft Office Excel program library. It can be used directly when all historical data are enough and ready.

2 b) Using the regression line equation

Here, the linear prediction will be implemented after finding the regression line equation, which is:Y = a. X + b ??????? eqn (1)

Where:

Y: The dependent variable. a: Regression coefficient.

X: The independent variable. b: The constant parameter.

So, the implementing of the linear predication in this method requires the following procedure: Firstly, the finding of both parameters: the regression coefficient (a) and the constant (b) as follows:

statistical category of Microsoft Office Excel program library.

Secondly, writing the previous regression line equation.

Thirdly, divide all historical data to be either independent variables or dependent variables and determine them. Now, the prediction of the (Y) value can be obtained when the corresponding(X) value is entered.

This study uses the forecast statistical function method to implement the linear prediction, which will increase the efficiency of the study model, since it will save time and effort in using this model, by avoiding the use of regression line equation in the Microsoft Office Excel program which requires more time and effort due to its long procedure.

IV.

3 How Does the Model Work?

The Palestine Radar Model (PRM) uses the linear predication by using the (Forecast Function) that is categorized under Excel statistical functions. The regression coefficient (a) can be obtained directly by using (Slope Function) that is included in the statistical category of Microsoft Office Excel program library. Also, the constant (b) can be obtained directly by using (Intercept Function) that is included in the V.

4 Results Accuracy

The accuracy of the model results which are the expected numbers of the infected cases of COVID-19 virus in Palestine for the coming dates depends on the accuracy of input data of the model.

The input data of the model which are the historical numbers of the infected cases from the beginning of the (5 th March 2020) to the end of (31 th March 2020) and their corresponding dates are being recorded accurately according to the daily reports of the Palestine Ministry of Health **??**4].

So, this study expects accurate results with a surely normal percentage of error which comes from prediction.

VI.

5 Designing the Model

The Palestine Radar Model (PRM) is designed by using Microsoft Office Excel Program. The model includes two main sections, as follows:

The first section is the (Input Section) which includes the following parameters: a) The historical dates from the beginning of the (5 th March 2020) to the end of (31 th March 2020). b) The corresponding sequential numbers of the previous dates. c) The historical numbers of the infected cases from the beginning of the (5 th March 2020) to the end of (31 th March 2020). Now, for the dates that the model looking to predict for them, the entered data of the Forecast function will be as follows: VIII.

6 The following figure shows the input section of the model design [1], [2], [4]:

7 The Results

After running the model, the results that are related to the expected numbers of the infected cases of COVID-19 virus in Palestine are as follows:

8 Results Analysis

According to the model results which are shown in the previous figure (5), there is a negative side and also a positive side, as follows:

9 a) The Negative Side of the Results

As it is shown to the results in the figure (5), there is an increase for the expected numbers of the infected cases of COVID-19 virus in Palestine during the coming April. The expected number of the infected cases of COVID-19 virus in Palestine till to the end of 30 th April 2020 is expected to reach to (216) infected case.

10 b) The Positive Side of the Results

As it is shown in whole study, from the beginning of 5 th March 2020 to the end of 30 th April 2020, there is a decrease for the (Growth Rate) of spreading the COVID-19 virus in Palestine by more than (15%) . And this means that the Growth Rate of spreading COVID-19 virus in Palestine for the coming (4) weeks will decrease by more than (15%).

11 X. Conclusion and Recommendations a) Conclusion

Palestine Radar Model (RPM) predicts the spreading of COVID-19 virus in Palestine for the coming April 2020 that is ended in the following dates respectively:

(4/4/2020, 12/4/2020, 19/4/2020, 30/4/2020), with two contradictory results as follows:

The bad results: there is an increase in the expected numbers of the infected cases of COVID-19 virus in Palestine during the coming April 2020. The expected number of the infected cases of COVID-19 virus in Palestine till to the end of 30 th April 2020 is expected to reach to (216) infected case.

The good results: there is a decrease for the (Growth Rate) of spreading the COVID-19 virus in Palestine by more than (15%) till to the end of 30th April 2020. The study refers that for the awesome emergency case that the Palestinian government and leadership have applied on Palestine, which adopts the preventing strategy before treatment strategy, by applying the theory of social spacing through closing the schools and universities, limiting motion, asking people strongly for home-stay, Isolating the cities and towns, stopping the tourism activities, and closing the borders. In addition to the ongoing awareness activities for people and society about COVID-19 virus through the various media and also and the social media.

12 b) Recommendations

This study presents the following recommendations for Palestinian government and leadership and also for the society and people:

-The study strongly asks from the Palestinian government and leadership to continue in applying the case of emergency in Palestine for the coming April 2020. -Ensuring from the ready of Palestine medical infrastructure to deal with the expected numbers of infected cases that this study predicts for the coming April 2020, especially, that the expected number of infected cases that is predicted by the study model is: (216) infected cases. -Activate and develop more awareness activities about preventing COVID-19 virus for society and people from the specialized sides of the government, especially after the success of the emergency case that has launched by Palestine government which may reduce the growth rate of spreading the COVID-19 virus by more than (15%) according to the results of this study, and which means the receding of the virus instead of the spreading it more. -The development of the emergency case to be stronger is better. -Asking society and people for more commitment towards Palestine leadership instructions and advises.

-Asking God to Save our Home- [1] [2] [3]

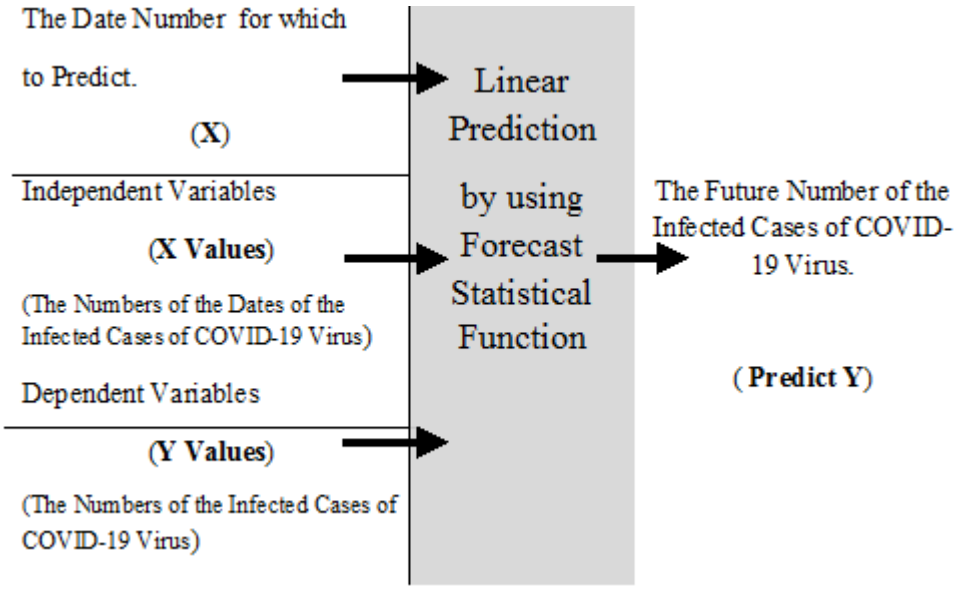

Figure 1: Palestine

[1] © 2020 Global Journals Palestine Radar Model (PRM) for Predicting the Number of Infected Cases of COVID-19 Virus in Palestine

[2] © 2020 Global Journals

[3] Palestine Radar Model (PRM) for Predicting the Number of Infected Cases of COVID-19 Virus in Palestine

	A	B	C
1	Palestine Radar Model for Predicting		he Number of Infected Cases of COVID-19 Virus
2			
3	The Date	Number	The Number of Infected Cases of COVID-19 Virus
4	5/3/2020	1	7
5	6/3/2020	2	7
6	7/3/2020	3	16
7	8/3/2020	4	19
8	9/3/2020	5	27
9	10/3/2020	6	27
10	11/3/2020	7	30
11	12/3/2020	8	31
12	13/3/2020	9	35
13	14/3/2020	10	38
14	15/3/2020	11	38
15	16/3/2020	12	39
16	17/3/2020	13	41
17	18/3/2020	14	44
18	19/3/2020	15	47
19	20/3/2020	16	48
20	21/3/2020	17	52
21	22/3/2020	18	59
22	23/3/2020	19	59
23	24/3/2020	20	60
24	25/3/2020	21	62
25	26/3/2020	22	86
26	27/3/2020	23	91
27	28/3/2020	24	97
28	29/3/2020	25	108
29	30/3/2020	26	116
30	31/3/2020	27	117

Page 1 Page 3

Figure 2:

	A	B	C
32	(The Predicting Results for the Coming April Month)		
33	The Date	The Number of Predected Infected Cases of COVID-19 Virus	
34	4/4/2020		
35			(??) Predected Infected Cases
36	12/4/2020		
37			(??) Predected Infected Cases
38	19/4/2020		
39			(??) Predected Infected Cases
40	30/4/2020		
41			(??) Predected Infected Cases
42			
43	(GOD Save our Home)		
44			

Figure 3:

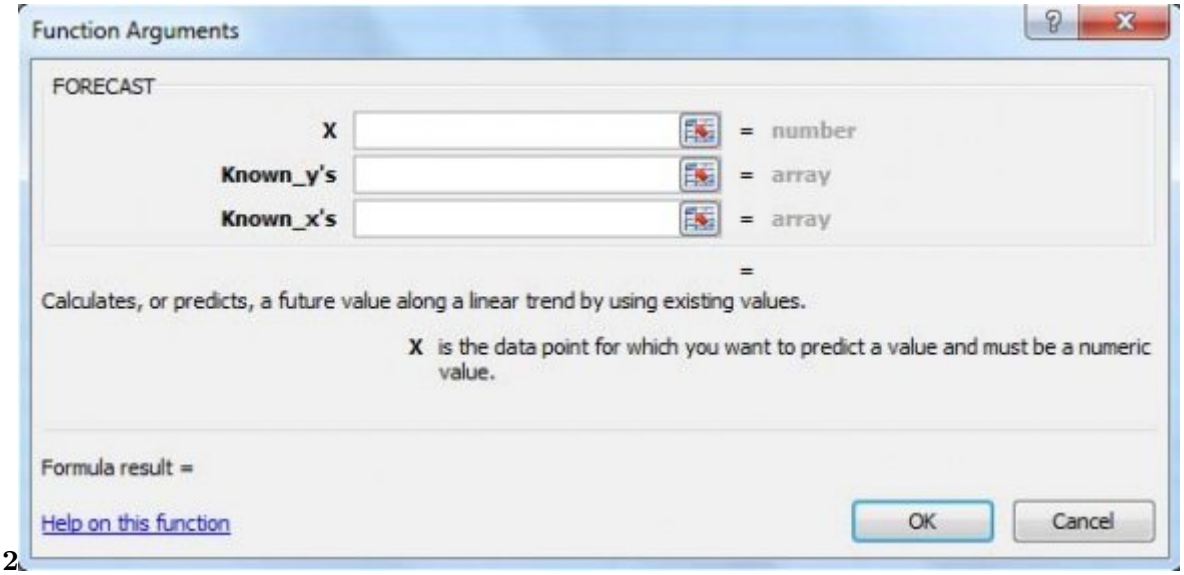

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Figure 4: Figure 2 :

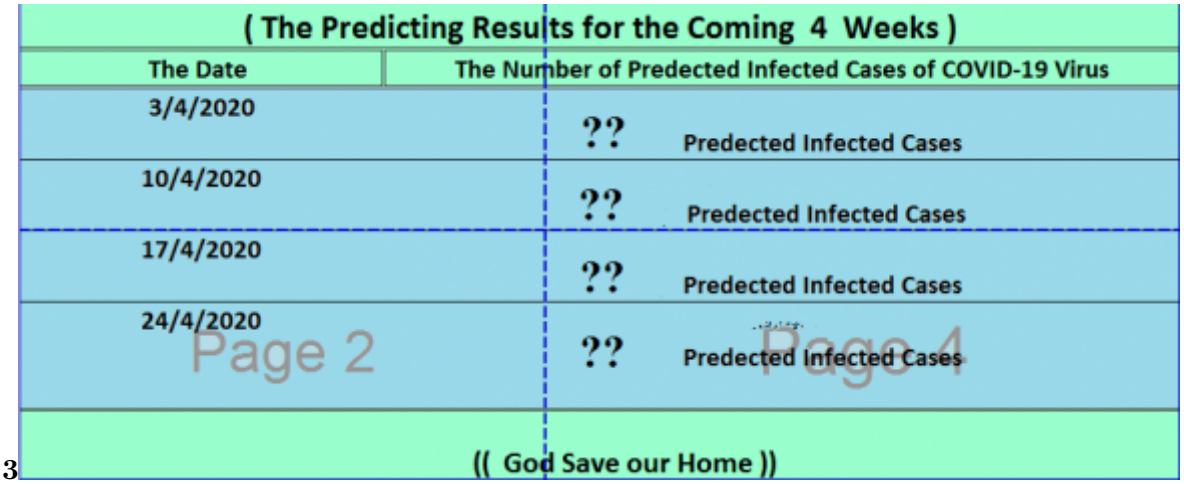

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Figure 5: Figure 3 :

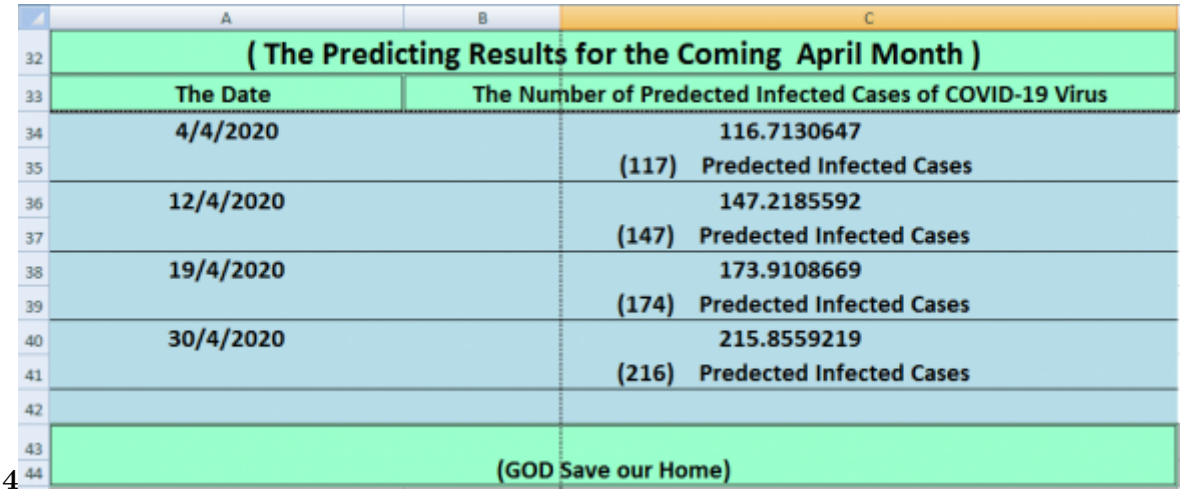

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Figure 6: Figure 4 :

1

Dates to Predict	X	Y's	X's
4/4/2020	31	C4:C30	B4:B30
12/4/2020	39	C4:C30	B4:B30
19/4/2020	46	C4:C30	B4:B30
30/4/2020	57	C4:C30	B4:B30

Figure 7: Table 1 :

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