Project on Machine Learning

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Covid 19 – The Increasing Pandemic In India

- Coronavirus is an infectious disease caused by severe acute respiratory syndrome (SARS COV-2).Common symptoms include fever,cough,fatigue,shortness of breath and loss of smell and taste.While majority of cases causes respiratory symptoms,some progress to acute respiratory distress syndrome and may cause multi organ failure,septic shock and blood clots. The virus is primarily spread between people in close proximity most often via small droplets produced by coughing and also people may get affected by touching contaminated surface.The standard method of diagonisis is by time reverse transcription polymerase chain reaction(rRT-PCR)from a nasopharynx swab.Chest CT imaging may also be hepful.

Aims And Objectives Of Project

- While the authorities claimed that the 10-day lockdown was a success because they managed to test the maximum number of people and in creased bed capacity for COVID-19 patients,the situation on ground has taken an alarming turn.Ventilator support beds are over and only a few beds with oxygen remain.Even the critical patients are struggling for beds. So this project is done aiming to get a rough estimate of the requirement of covid beds as per records.

Brief Description Of Project

- In this project at first three datasets are taken as no of days,no of beds and no patients. After that the dataset is divided into 90% training and 10% testing datasets.After polynomial regression is used which is a form of regression analysis in which relationship between independent variable x and dependent variable y is modelled as an nth degree polynomial in x.Then a graph is plotted on the given dataset,predicting the nature of the graph.Here, no of beds are plotted on y axis and no of days on x axis.Finally the estimated value of the no of beds are predicted.

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In [1]:
```
import numpy as np
import pandas as pd
from matplotlib import pyplot as plt
from sklearn.linear_model import LinearRegression
from sklearn.preprocessing import PolynomialFeatures
```

In [2]:
```
data = pd.read_csv('covidbeds.csv')
data
```

Out[2]:

	beds	days	patients
0	119000	1	118043
1	1241000	4	1238635
2	1435500	8	1435453
3	1804700	14	1803695
4	2087711	19	2086611
5	3680000	30	3670000
6	4789000	45	4784000
7	6260000	60	6256000
8	8482000	76	8481000
9	9295000	85	9294000
10	12100000	92	12000000
11	12560000	110	12550000
12	14540000	130	14520000

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In [3]:
```
x=data['days']
y=data['beds']
y
```

Out[3]:
```
0       119000
1      1241000
2      1435500
3      1804700
4      2087711
5      3680000
6      4789000
7      6260000
8      8482000
9      9295000
10    12100000
11    12560000
12    14540000
13    16232211
Name: beds, dtype: int64
```

In [4]:
```
linear_reg = LinearRegression()
linear_reg.fit(data[['days']],data.beds)
```

Out[4]:
```
LinearRegression(copy_X=True, fit_intercept=True, n_jobs=None, normalize=False)
```

ploynomial_reg = PolynomialFeatures(degree = 3) real_x_poly = ploynomial_reg.fit_transform(data[['days']]) ploynomial_reg.fit(real_x_poly,y) linear_reg2 = LinearRegression() linear_reg2.fit(real_x_poly,y)

In [6]:
```
ploynomial_reg = PolynomialFeatures(degree = 3)
real_x_poly = ploynomial_reg.fit_transform(data[['days']])
```

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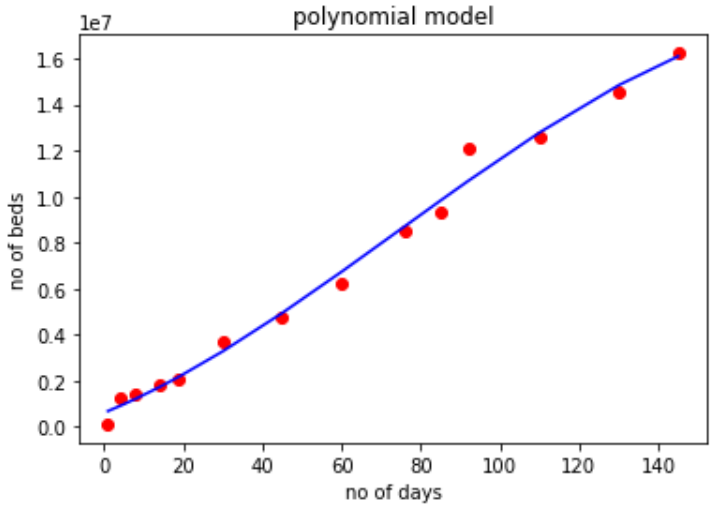
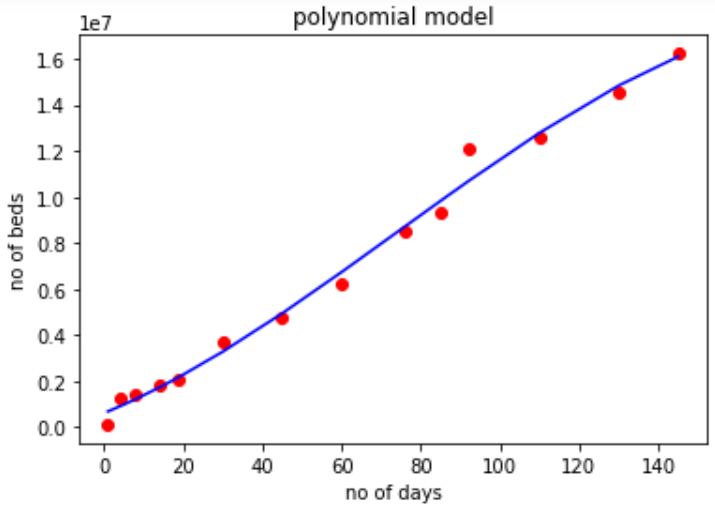
In [6]:
```
ploynomial_reg = PolynomialFeatures(degree = 3)
real_x_poly = ploynomial_reg.fit_transform(data[['days']])
ploynomial_reg.fit(real_x_poly,y)
linear_reg2 = LinearRegression()
linear_reg2.fit(real_x_poly,y)
plt.scatter(x,y,color = 'red')

plt.plot(data[['days']],linear_reg2.predict(ploynomial_reg.fit_transform(data[['days']])),color = 'blue')
plt.title('polynomial model')
plt.xlabel('no of days')
plt.ylabel('no of beds')
plt.show()
```



In [8]:
```
linear_reg2.predict(ploynomial_reg.fit_transform([[150]]))
```



In [8]:
```
linear_reg2.predict(ploynomial_reg.fit_transform([[150]]))
```

Out[8]:
```
array([16449651.44089495])
```

In [ ]:

In [ ]:

In [ ]:

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THANK YOU