Project Python Internship Report on

"Corona Based Analysis on .csv File"

Submitted to

Visvesvaraya Technological University
Jnana Sangama, Belagavi

In partial fulfillment of the requirements for the award of Certificate in
Python Internship in Computer Science and Engineering
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NBA ACCREADTED, ISO CERTIFIED

Department of Computer Science and Engineering

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S. G. BALEKUNDRI INSTITUTE OF TECHNOLOGY

Shivabasavanagar, Belagavi-10, Karnataka.

2022 - 2023

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CERTIFICATE

Certified that the Project Python Internship Report on entitled **"Corona Based Analysis on .csv File"** is a Bonafede work carried out by **Mr Swapandeep Kapuri (2BU20CS098) and Mr Omkar Bhandari (2GI20CS098)** in fulfillment for the award of Certificate in Python Machine Learning, from JThorn Technology Services Private Limited Belagavi, during the year 2022-2023. The Internship Project report has been approved as it satisfies the academic requirements in respect of Python Machine Learning Project work prescribed for the said Python Machine Learning Certification Program.

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ACKNOWLEDGEMENT

It is my privilege that I was able to work in this python machine learning project and I like to express my gratitude to these people, without them I may not be able to create this project. Their precious time and their guidance have led me to competition of this project without many obstacles.

First and the foremost, I wish to record our sincere gratitude to Management of this college and to our beloved Professor, **Dr. B.R. Patagundi**, Principal of S. G. Balekundri Institute of Technology, Belagavi for his constant support and encouragement in preparation of this report and for making available library and laboratory facilities needed to prepare this report.

My sincere thanks to **Dr. B.S. Halakarnimath**, Head, Department of Computer Science and Engineering in S.G.B.I.T. for the valuable suggestions and guidance through the period of preparation of this report.

I express my sincere gratitude to our beloved guide **Guide Dr. Sunil F Rodd**, **Professor** and **Dr. Shrinivas Mangalwede, Professor** in the Dept. of Computer Science and Engineering of S.G.B.I.T., Belagavi and JThorn Technology Private Limited for guiding me in investigations for this project. Our numerous discussions with him were extremely helpful. I told them that in their esteem guidance, encouragement and inspiration received from them helped me a lot. The course on Python Machine Learning Internship Program was very helpful to us in giving the necessary background information and inspiration in choosing this topic for the Internship project. The class room lectures very much knowledgeable, informative and interesting.

I wish to thank all the source materials available from our college library and the digital library for providing me in the source materials, books for the required project and source materials.

Finally, I would like to thank my fellow classmates, friends and my parents for the constant support and encouragement for the completion of this project.

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ABSTRACT

This document is meant for describing all the features and procedures that were followed while developing the system. This document specially mentions the details of the project and how it was developed, the primary requirement, as well as various features and functionalities of the project and the procedures followed in achieving these objectives.

The COVID-19 pandemic in India has disrupted our country in an unprecedented way, and data analytics have played a crucial role in understanding and mitigating its impact. In this project, we explore COVID-19 data using Python and machine learning techniques. The data is in a .csv file, which we load into a pandas data frame for analysis. We perform exploratory data analysis to understand the trends and patterns in the data.

Overall, this project demonstrates how Python and machine learning techniques can be used to gain insights into the COVID-19 pandemic in India and make predictions about its future impact. The dashboard provides a user-friendly interface to explore the data and stay up to date with the latest COVID-19 statistics in India.

Keywords: Reading the .csv file contents related to corona pandemic in India, Analytics based on that using Python machine learning library called Pandas, getting results related to the problem statement, solving real life problems based on analytics.

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Chapter 1 Introduction
1.1: Introduction to the Project

1. **Data Collection:** The first step in any data analysis project is data collection. For this project, you can download the COVID-19 dataset from a reliable source, such as the Kaggle website or the official Indian government website. This dataset contains daily COVID-19 cases and deaths reported in India since the beginning of the pandemic.

2. **Data Pre-processing:** Once you have the data, the next step is to clean and pre-process it. You can use Python Pandas library to read the .csv file and convert it into a dataframe. Then, you can perform some basic data cleaning operations such as removing duplicates, handling missing values, and changing the data types of some columns.

3. **Exploratory Data Analysis:** After pre-processing the data, you can start exploring it to gain insights and identify patterns. You can use Python's matplotlib or seaborn library to create different types of visualizations such as line plots, bar plots, and heatmaps to show how COVID-19 cases and deaths have changed over time in India.

4. **Feature Engineering:** Feature engineering is the process of creating new features from existing data that can help improve the performance of machine learning models. In this project, you can create new features such as daily cases, daily deaths, and rolling averages to capture the trends and patterns in the data.

Through this project we can automate the data processing required in minutes of time using python's pandas framework.

1.2: Problem Definition

1. Get the first 6 rows.

2. Check the columns contained in the dataset.

3. Check the shape of the dataframe.

4. Check if the dataframe has any null values.

5. List the last 6 rows.

6. check the values for the columns ''ConfirmedIndianNational' and 'ConfirmedForeignNational'.

7. Drop the columns 'Sno' and 'Time'.

8. Find out the maximum cases until 11th Aug 2021 for each state.

9. Find out the total confirmed cases till 11th Aug 2021.

10. Find out the percentage for Active, fatal, and cured cases.

11. Check the data for the 10 most affected states with covid-19 in India.

12. Find out the total death till Aug 2021.

The problem addressed in this project is to analyse the COVID-19 pandemic situation in India by exploring the daily reported cases and deaths data. The goal is to gain insights into the trends and patterns in the data and predict the future trends using machine learning algorithms. The project aims to help understand the severity of the pandemic in India and provide valuable information for decision-making and resource allocation.

1.3: Motivations/ Objectives

Motivations:

The motivation for this project is to help understand the severity of the COVID-19 pandemic in India by analysing the daily reported cases and deaths data. The COVID-19 pandemic has had a significant impact on India, with many cases and deaths reported daily. The motivation behind this project is to help understand the severity of the pandemic in India by analysing the daily reported cases and deaths data.

This project aims to provide valuable information for decision-making and resource allocation by government agencies, healthcare organizations, and individuals. The project can also help in identifying potential areas of improvement in the COVID-19 response in India and contribute to the global fight against the pandemic.

Objectives:

The specific objectives of this project are:

1. To pre-process the COVID-19 dataset and clean the data to ensure it is accurate and usable.
2. To explore the data and gain insights into the trends and patterns in the COVID-19 cases and deaths in India.
3. To create new features using feature engineering to capture the trends and patterns in the data.
4. To provide insights and information to decision-makers and the public about the severity of the COVID-19 pandemic in India and its future trends.

Chapter 2 System Requirements

2.1: Software Requirements

- ### Backend

1. You will need .csv configured in the same folder/directory as the python project.

2. You will need Python 3.10.9 and pandas 1.5.2 or upwards as a data framework, to work as a mediator between backend and frontend.

3. Excel program or text program to access the .csv file directly.

- ### Frontend

1. You will need latest version of graphical based processing unit or GPU since it utilizes multiple data related models in it.

2. Spyder IDE for python code visualization and implementations.

2.2: Hardware Requirements

- ### Functional Requirements

1. It should be running on Windows 10/11 as an operating system.

2. The processor must be of intel core i3 10th generation and upwards.

3. The processor must be of architecture x86-64, with a 64-bit architecture with dual core processor.

4. It should have free space of up to 100 Mb for the program to run properly.

- ### Non-Functional Requirements

1. It should have good hardware compatibility with the framework as well as the software's which are going to be used.

2. The processor must be streamlined to perform high level of data manipulation.

3. Robust system software if any unknown damage occurs to the computational device.

Chapter 3 Implementations

3.1: Checking the .csv file

The .csv file name is CaseStudy-11.csv which must be in the same directory as the python file, since it does not uses OS python module through which it can directed to that particular file location by the user.

As soon as the python project detects the file, the operations related to it can be started.

3.2: Analysis of the content

It has 18,110 rows from starting date 1/30/2020 till 8/11/2021 i.e from 30th of January 2020 till 11th of August 2021.

It has 9 columns namely Sno, Date, Time, State/Union Territory, Confirmed Indian National, Confirmed Foreign National, Cured, Deaths and Confirmed.

These are its analytical information:

```
RangeIndex: 18110 entries, 0 to 18109
Data columns (total 9 columns):
 #   Column                   Non-Null Count  Dtype
---  ------                   --------------  -----
 0   Sno                      18110 non-null  int64
 1   Date                     18110 non-null  object
 2   Time                     18110 non-null  object
 3   State/UnionTerritory     18110 non-null  object
 4   ConfirmedIndianNational  18110 non-null  object
 5   ConfirmedForeignNational 18110 non-null  object
 6   Cured                    18110 non-null  int64
 7   Deaths                   18110 non-null  int64
 8   Confirmed                18110 non-null  int64
dtypes: int64(4), object(5)
memory usage: 1.2+ MB
```

3.3: Code of the project

```python
import numpy as np
import pandas as pd
from matplotlib import pyplot as plt

stdata=pd.read_csv("CaseStudy-11.csv")
t=True
while(t==True):
    n=int(input(""" Welcome to Python internship project done by Swapnadeep
Kapuri and Omkar Bhandari
            Menu (select any one of it)
            1.Get the 1st six rows
            2.Check the columns contained in the data set
            3.Check the shape of the dataframe
            4.Check if the data frame has any null values
            5.List the last six rows
            6.Check the values for the columns /"Confirmed Indian National" and
/"Confirmed Foreign National"
            7.Drop the columns /'Sno' and /'Time'
            8.Find the maximum cases until 11th August 2021 for each state
            9.Find out total confirmed cases till 11th August 2021
            10.Find the percentage of the active, fatal and cured cases
            11.Check out the data for the 10 most affected states with covid-19 in
India
            12.Find out total deaths till August 2021
            13.EXIT
            DEFAULT:Error
            Enter your option:"""))
    if(n==1):
        print("The 1st six rows are:")
        print(stdata.head(6))
    if(n==2):
        print("The columns contained in the data set are:")
        print(stdata.columns)
    if(n==3):
        print("Shape of the dataframe is (i.e rows and columns):")
        print(stdata.shape)
    if(n==4):
        print("Does the Dataframe contains null values?")
        print(stdata.isnull().sum())
    if(n==5):
        print("The last six rows are:")
        print(stdata.tail(6))
    if(n==6):
```

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```
        print("The values of the columns of Confirmed Indian and Foreign
Nationals are:")
        print(stdata[["ConfirmedIndianNational","ConfirmedForeignNational"]])
    if(n==7):
        print("As dropping columns might disturb .csv files instead columns
except of Sno and Time will be displayed")

print(stdata[["Date","State/UnionTerritory","ConfirmedIndianNational","Confir
medForeignNational","Cured","Deaths","Confirmed"]])
        print("Note: By using stdata.drop(['Sno','Time']) method we can drop the
required columns if required")
    if(n==8):
        print("The maximum cases until 11th August 2021 for each state is:")

result=stdata[["Date","State/UnionTerritory",'Confirmed']].loc['1/30/2020':'8/11
/2021'].groupby(["State/UnionTerritory"]).max()["Confirmed"]
        print(result)
    if(n==9):
        print("Total Confirmed cases until 11th August 2021 is:")

result2=stdata[["Date","State/UnionTerritory",'Confirmed']].loc['1/30/2020':'8/1
1/2021'].groupby(["State/UnionTerritory"]).sum()["Confirmed"]
        print(result2)
    if(n==10):
        print("The percentage of active cases are:")
        result3=((stdata.sum()["Confirmed"]-
stdata.sum()["Cured"])/stdata.sum()["Confirmed"])*100
        print(result3)
        print("The percentage of fatal cases i.e deaths are:")
        result9=(stdata.sum()["Deaths"]/stdata.sum()["Confirmed"])*100
        print(result9)
        print("The percentage of cured cases are:")
        result10=(stdata.sum()["Cured"]/stdata.sum()["Confirmed"])*100
        print(result10)
        print("The percentage in the pie chart is as following:")
        x=np.array([result3,result9,result10])
        labels = ['Active', 'Fatal', 'Cured']
        colors = ['red', 'blue', 'green']
        plt.pie(x,labels=labels, colors=colors)
        plt.title("The percentage of covid cases")
        plt.show()
    if(n==11):
        print("The data of 10 most affected states in India are:")

result4=stdata[["Date","State/UnionTerritory",'Confirmed']].loc['1/30/2020':'8/1
```

```
1/2021'].groupby(["State/UnionTerritory"]).sum()["Confirmed"].sort_values().t
ail(10)
        print(result4)
    if(n==12):
        print("Total Deaths till 11th August 2021 is:")
        result5=stdata.loc['1/30/2020':'8/11/2021'].sum()["Deaths"]
        print(result5)
    if(n==13):
        t=False
    if(type(n)!=int or n>13 or n<1):
        print("Wrong Option typed!! Please type a correct option!!")
```

Chapter 4 Results of the Project
4.1: Screenshots and their functionality

Figure1.1: Main Menu of our program.

Figure 1.2: First Six rows of the column are:

Figure 1.3: Columns contained in the data set

```
The columns contained in the data set are:
Index(['Sno', 'Date', 'Time', 'State/UnionTerritory',
       'ConfirmedIndianNational', 'ConfirmedForeignNational', 'Cured',
       'Deaths', 'Confirmed'],
      dtype='object')
```

Figure 1.4: Shape of the data frame

```
Shape of the dataframe is (i.e rows and columns):
(18110, 9)
```

Figure 1.5: Does the dataframe contain any null value

```
Does the Dataframe contains null values?
Sno                            0
Date                           0
Time                           0
State/UnionTerritory           0
ConfirmedIndianNational        0
ConfirmedForeignNational       0
Cured                          0
Deaths                         0
Confirmed                      0
dtype: int64
```

Figure 1.6: Last six columns in the row

```
The last six rows are:
        Sno      Date    Time State/UnionTerritory ConfirmedIndianNational ConfirmedForeignNational    Cured Deaths
18104  18105  8/11/2021  8:00 AM           Tamil Nadu                       -                        - 2524400  34367
18105  18106  8/11/2021  8:00 AM            Telangana                       -                        -  638410   3831
18106  18107  8/11/2021  8:00 AM              Tripura                       -                        -   77811    773
18107  18108  8/11/2021  8:00 AM          Uttarakhand                       -                        -  334650   7368
18108  18109  8/11/2021  8:00 AM        Uttar Pradesh                       -                        - 1685492  22775
18109  18110  8/11/2021  8:00 AM          West Bengal                       -                        - 1506532  18252
```

Figure 1.7: Check the values for the columns /"Confirmed Indian National" and /"Confirmed Foreign National"

```
The values of the columns of Confirmed Indian and Foreign Nationals are:
       ConfirmedIndianNational ConfirmedForeignNational
0                            1                        0
1                            1                        0
2                            2                        0
3                            3                        0
4                            3                        0
...                        ...                      ...
18105                        -                        -
18106                        -                        -
18107                        -                        -
18108                        -                        -
18109                        -                        -
```

Figure 1.8: Dropping the columns Sno and Time

```
As dropping columns might disturb .csv files instead columns except of Sno and Time will be displayed
           Date State/UnionTerritory ConfirmedIndianNational ConfirmedForeignNational    Cured  Deaths  Confirmed
0      1/30/2020               Kerala                       1                        0        0       0          1
1      1/31/2020               Kerala                       1                        0        0       0          1
2       2/1/2020               Kerala                       2                        0        0       0          2
3       2/2/2020               Kerala                       3                        0        0       0          3
4       2/3/2020               Kerala                       3                        0        0       0          3
...          ...                  ...                     ...                      ...      ...     ...        ...
18105  8/11/2021            Telangana                       -                        -   638410    3831     650353
18106  8/11/2021              Tripura                       -                        -    77811     773      80660
18107  8/11/2021           Uttarakhand                      -                        -   334650    7368     342462
18108  8/11/2021         Uttar Pradesh                      -                        -  1685492   22775    1708812
18109  8/11/2021           West Bengal                      -                        -  1506532   18252    1534999

[18110 rows x 7 columns]
Note: By using stdata.drop(['Sno','Time']) method we can drop the required columns if required
```

Figure 1.9:Maximum cases happening in each state is

```
The maximum cases until 11th August 2021 for each state is:
State/UnionTerritory
Andaman and Nicobar Islands                    4352
Andhra Pradesh                               827882
Arunachal Pradesh                             14998
Assam                                        206982
Bihar                                        216707
Cases being reassigned to states               9265
Chandigarh                                    14476
Chhattisgarh                                 188813
Dadra and Nagar Haveli and Daman and Diu       3255
Daman & Diu                                        2
Delhi                                        392370
Goa                                           43768
Gujarat                                      173642
Haryana                                      168880
Himachal Pradesh                              22264
Jammu and Kashmir                             95325
Jharkhand                                    102087
Karnataka                                    827064
Kerala                                       440130
Ladakh                                         6287
Madhya Pradesh                               172082
Maharashtra                                 1683775
Manipur                                       18750
Meghalaya                                      9607
Mizoram                                        2757
Nagaland                                       9075
Odisha                                       291825
Puducherry                                    35109
Punjab                                       133975
Rajasthan                                    198747
Sikkim                                         3958
Tamil Nadu                                   727026
Telengana                                    240970
Tripura                                       30852
Unassigned                                       77
Uttar Pradesh                                483832
Uttarakhand                                   62550
West Bengal                                  377651
Name: Confirmed, dtype: int64
```

Figure 1.10: Total Cases Happening in each states are as follows

```
State/UnionTerritory
Andaman and Nicobar Islands                   318096
Andhra Pradesh                              53942991
Arunachal Pradesh                             740253
Assam                                       14102643
Bihar                                       15428618
Cases being reassigned to states              345565
Chandigarh                                    797248
Chhattisgarh                                 7896236
Dadra and Nagar Haveli and Daman and Diu      262462
Daman & Diu                                        2
Delhi                                       27572570
Goa                                          2524894
Gujarat                                     13533544
Haryana                                     10257455
Himachal Pradesh                             1112274
Jammu and Kashmir                            5981280
Jharkhand                                    5953039
Karnataka                                   47252626
Kerala                                      16064974
Ladakh                                        394009
Madhya Pradesh                              10430010
Maharashtra                                115555420
Manipur                                       942243
Meghalaya                                     440286
Mizoram                                       154081
Nagaland                                      534126
Odisha                                      15891904
Puducherry                                   1984922
Punjab                                       8103389
Rajasthan                                   12033160
Sikkim                                        227921
Tamil Nadu                                  54491360
Telengana                                   16395321
Tripura                                      1893682
Unassigned                                       161
Uttar Pradesh                               30961852
Uttarakhand                                  3462741
West Bengal                                 21773265
Name: Confirmed, dtype: int64
```

Figure 1.11: The percentage of fatal, active and cured covid pandemic figures:

```
The percentage of active cases are:
7.439052414572355
The percentage of fatal cases i.e deaths are:
1.3461726050547043
The percentage of cured cases are:
92.56094758542764
The percentage in the pie chart is as following:
```
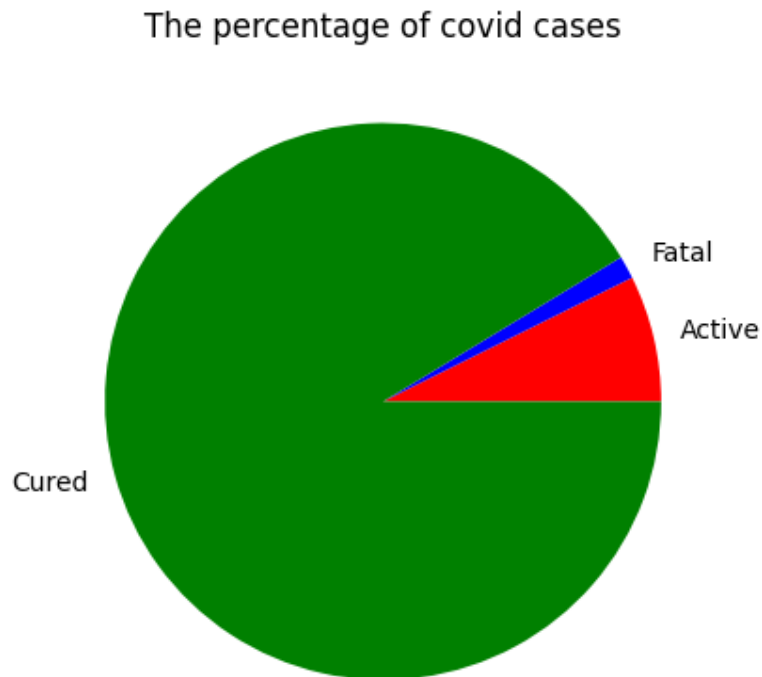
The percentage of covid cases

Figure 1.12: States with most affected cases are:

```
State/UnionTerritory
Odisha              15891904
Kerala              16064974
Telengana           16395321
West Bengal         21773265
Delhi               27572570
Uttar Pradesh       30961852
Karnataka           47252626
Andhra Pradesh      53942991
Tamil Nadu          54491360
Maharashtra        115555420
Name: Confirmed, dtype: int64
```

Figure 1.13:
```
Total Deaths till 11th August 2021 is:
8923431
```

Chapter 5 Conclusion

5.1: Project Conclusion

- India has been significantly impacted by the COVID-19 pandemic, with a large number of cases and deaths reported across the country.

- The pandemic has had a disproportionate impact on certain states and regions within India, with some areas experiencing much higher infection and mortality rates than others.

- The implementation of various government policies, such as lockdowns and vaccination drives, has had a significant impact on the trajectory of the pandemic in India.

- The pandemic has highlighted significant inequalities and weaknesses in India's healthcare system, and there is a need for investment and reform to strengthen the system and better prepare for future pandemics.

- The use of data analysis and visualization tools such as Pandas, Matplotlib, and NumPy can provide valuable insights into the spread and impact of the pandemic, as well as inform policy decisions and interventions.

6.2: References

1. Under the Guidance of Professor Srinivas Mangalwede sir, the project has been completed under Python Machine Learning Internship Programe.

2. **For multiple issues: https://stackoverflow.com/**