Data Collection and Preprocessing Phase

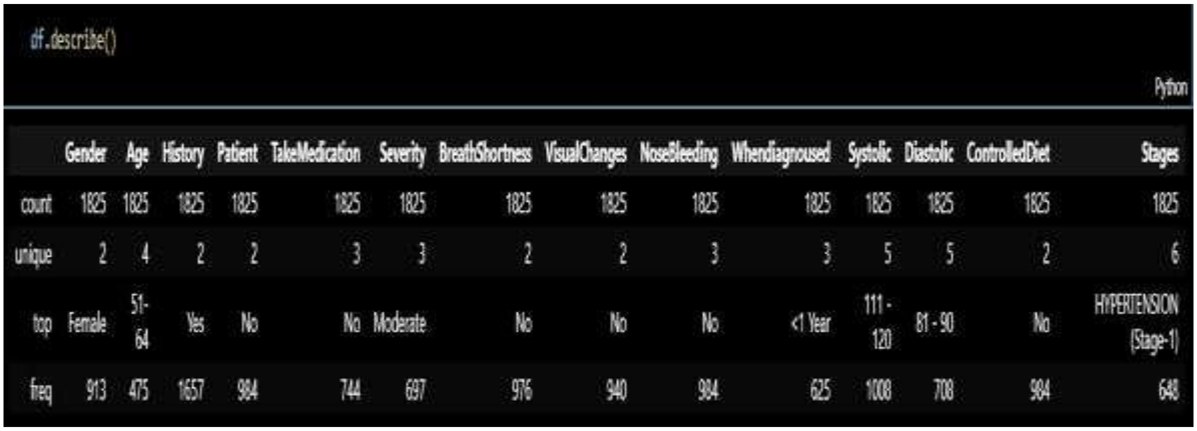
Date	28 June 2024
Team ID	739800
Project Title	Predictive Pulse: Harnessing Machine Learning For Blood Pressure Analysis.

Maximum Marks	6 Marks

Data Exploration and Preprocessing Report

Dataset variables will be statistically analyzed to identify patterns and outliers, with Python employed for preprocessing tasks like normalization and feature engineering. Data cleaning will address missing values and outliers, ensuring quality for subsequent analysis and modeling, and forming a strong foundation for insights and predictions.

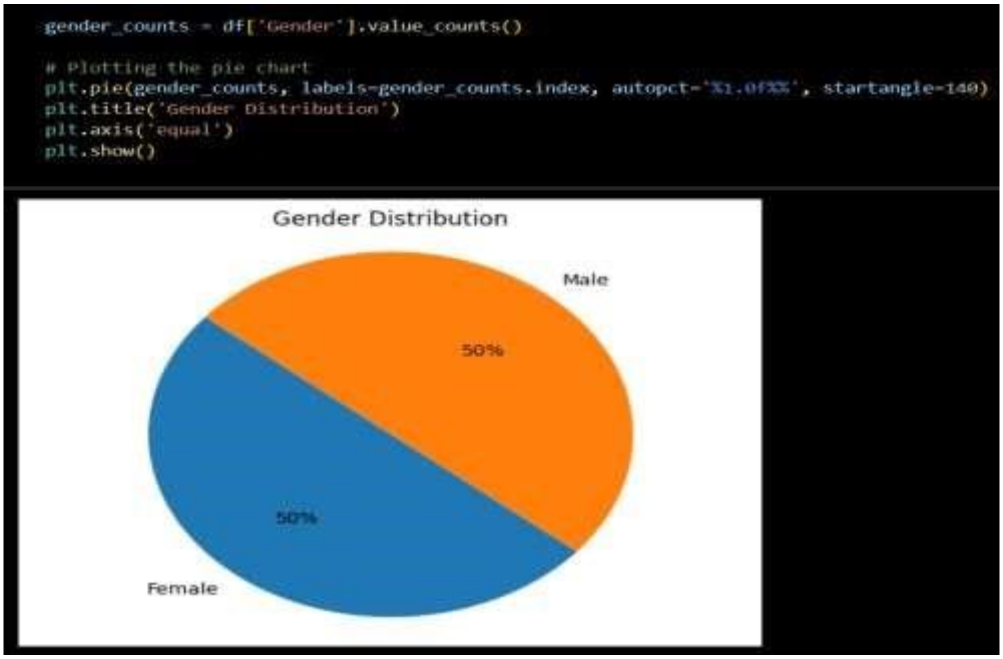
Section	**Description**

Data Overview	Descriptive Analysis:- 

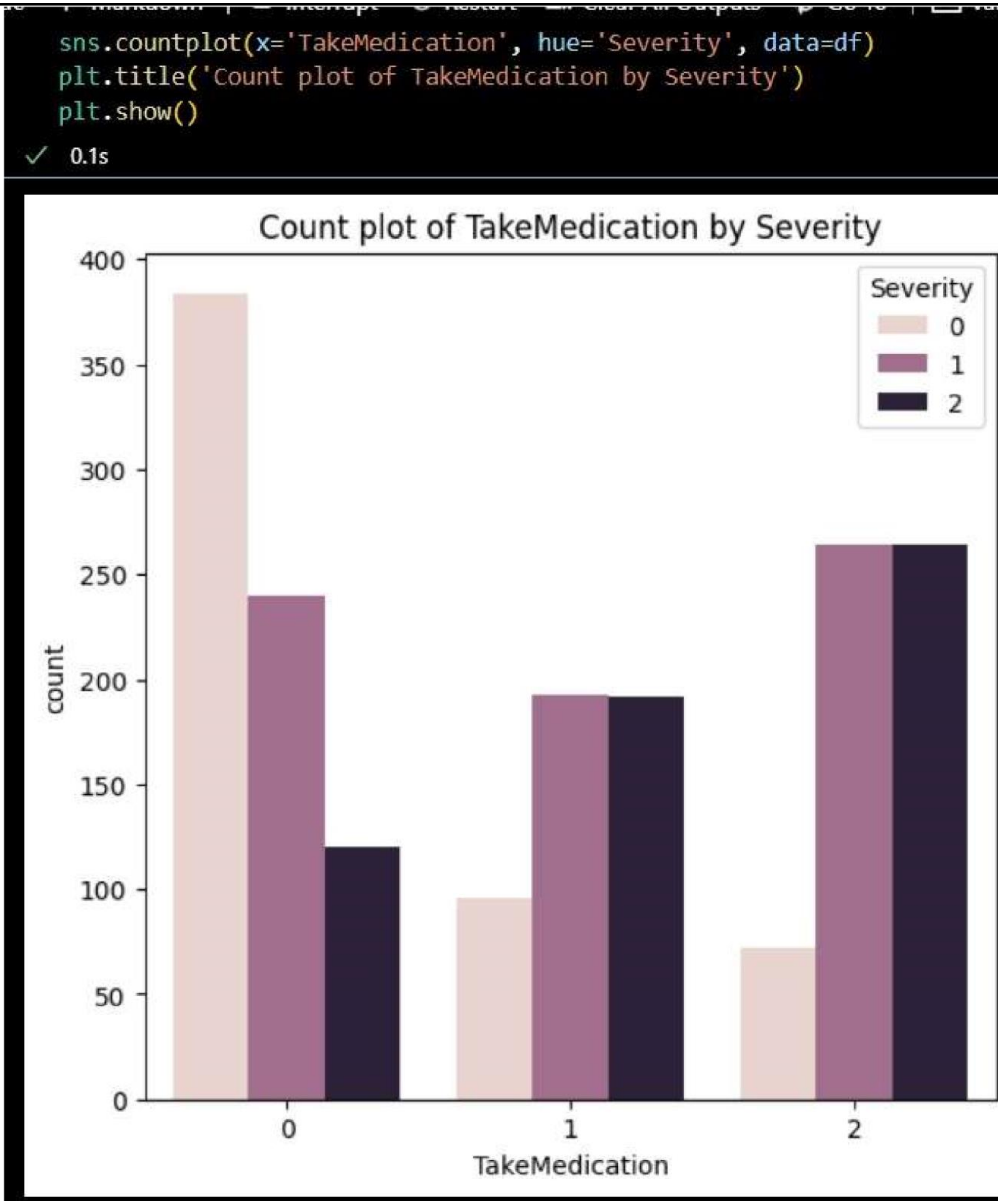
```
df.describe()
```

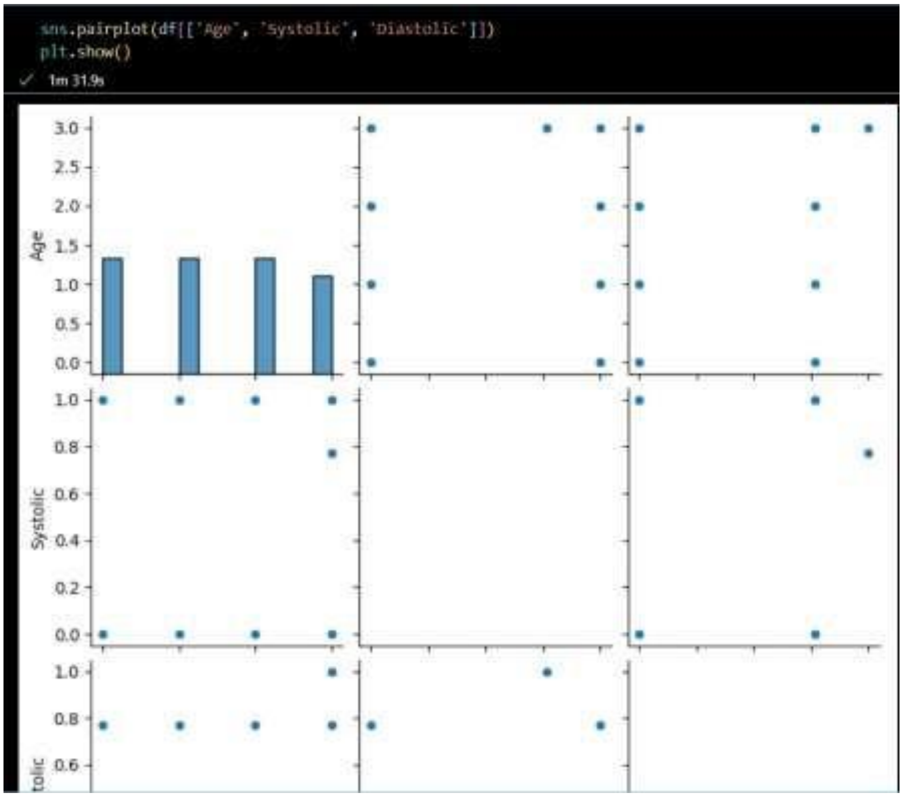
Python

	Gender	Age	History	Patient	TakeMedication	Severity	BreathShortness	VisualChanges	NoseBleeding	Whendiagnoused	Systolic	Diastolic	ControlledDiet	Stages
count	1825	1825	1825	1825	1825	1825	1825	1825	1825	1825	1825	1825	1825	1825
unique	2	4	2	2	3	3	2	2	3	3	5	5	2	6
top	Female	51-64	Yes	No	No	Moderate	No	No	No	<1 Year	111 - 120	81 - 90	No	HYPERTENSION (Stage-1)
freq	913	475	1657	984	744	697	976	940	984	625	1008	708	984	648

Univariate Analysis	

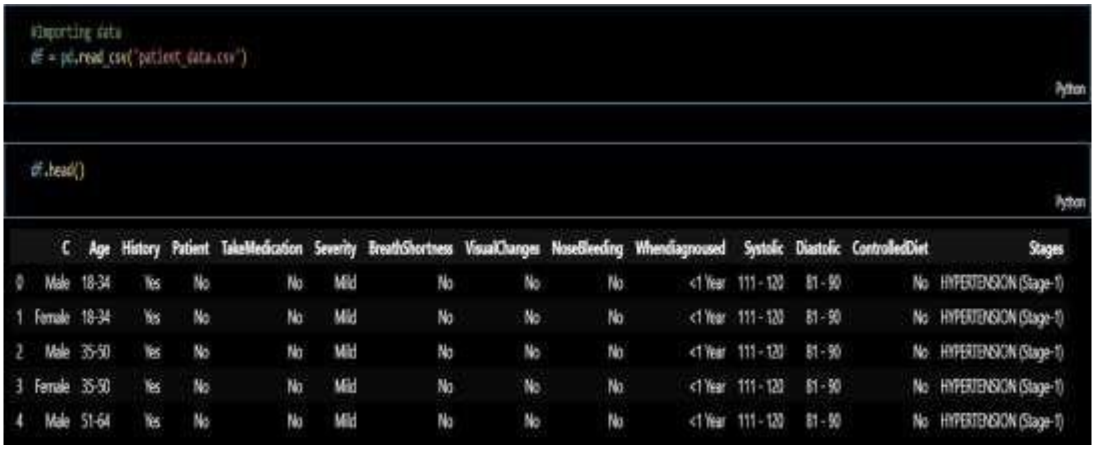
```
gender_counts = df['Gender'].value_counts()

# Plotting the pie chart
plt.pie(gender_counts, labels=gender_counts.index, autopct='%1.0f%%', startangle=140)
plt.title('Gender Distribution')
plt.axis('equal')
plt.show()
```

Bivariate Analysis	
	`sns.countplot(x='TakeMedication', hue='Severity', data=df)`
	`plt.title('Count plot of TakeMedication by Severity')`
	`plt.show()`
	✓ 0.1s

Multivariate Analysis	
	`sns.pairplot(df[['Age', 'Systolic', 'Diastolic']])`
	`plt.show()`
	✓ 1m 31.9s
	 Age
	3.0
	2.5
	2.0
	1.5
	1.0
	0.5
	0.0
	Systolic
	1.0
	0.8
	0.6
	0.4
	0.2
	0.0
	tolic
	1.0
	0.8
	0.6

Outliers and Anomalies	-
Data Preprocessing Code Screenshots	

Loading Data



```
#importing data
df = pd.read_csv('patient_data.csv')
```

Python

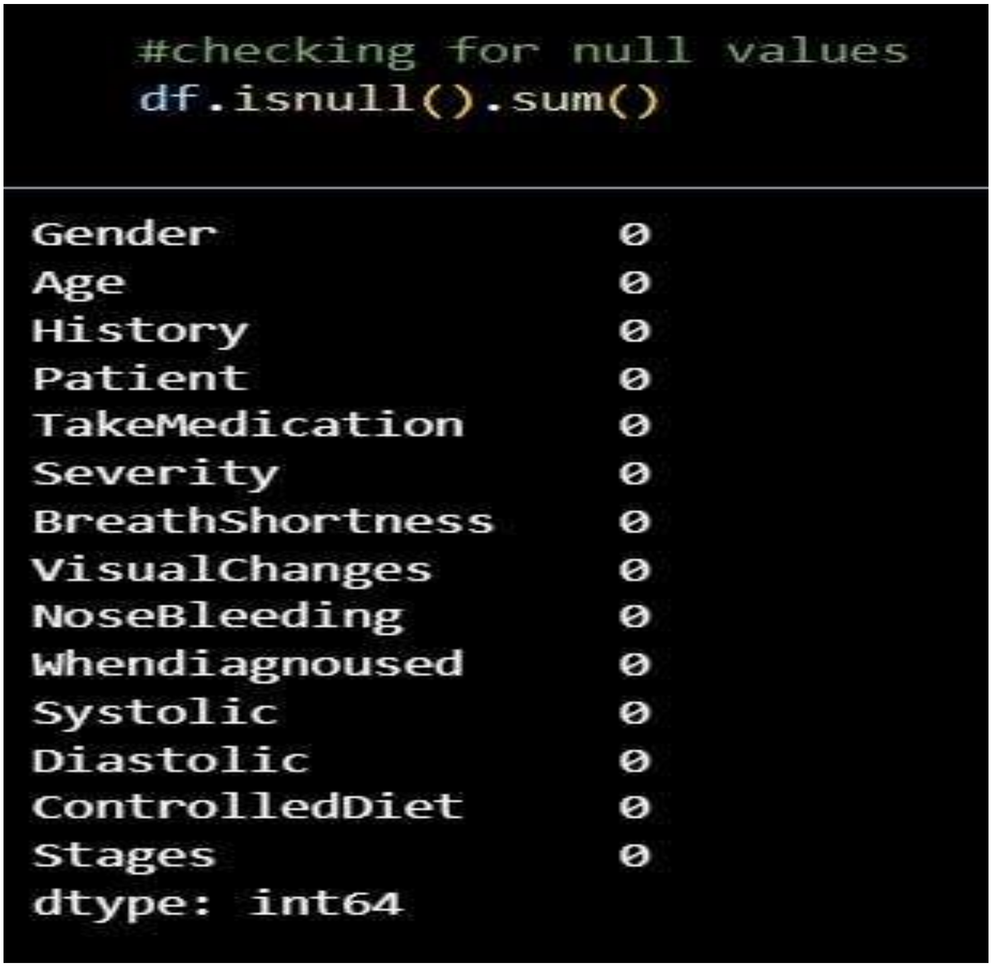
```
df.head()
```

Python

```
        C   Age  History  Patient  TakeMedication  Severity  BreathShortness  VisualChanges  NoseBleeding  Whendiagnoused   Systolic  Diastolic  ControlledDiet                  Stages
0    Male  18-34      Yes       No              No      Mild               No             No            No         <1 Year  111 - 120    81 - 90              No  HYPERTENSION (Stage-1)
1  Female  18-34      Yes       No              No      Mild               No             No            No         <1 Year  111 - 120    81 - 90              No  HYPERTENSION (Stage-1)
2    Male  35-50      Yes       No              No      Mild               No             No            No         <1 Year  111 - 120    81 - 90              No  HYPERTENSION (Stage-1)
3  Female  35-50      Yes       No              No      Mild               No             No            No         <1 Year  111 - 120    81 - 90              No  HYPERTENSION (Stage-1)
4    Male  51-64      Yes       No              No      Mild               No             No            No         <1 Year  111 - 120    81 - 90              No  HYPERTENSION (Stage-1)
```

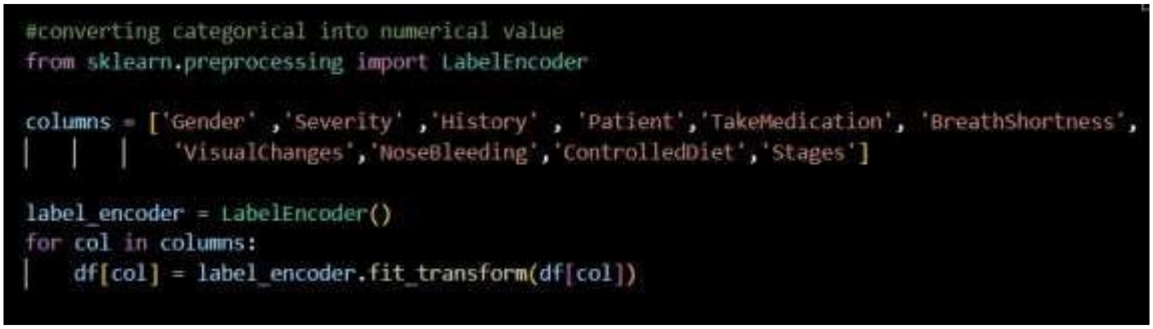
Handling

Missing Data



```
#checking for null values
df.isnull().sum()
```

```
Gender             0
Age                0
History            0
Patient            0
TakeMedication     0
Severity           0
BreathShortness    0
VisualChanges      0
NoseBleeding       0
Whendiagnoused     0
Systolic           0
Diastolic          0
ControlledDiet     0
Stages             0
dtype: int64
```

Data Transformation	

```
#converting categorical into numerical value
from sklearn.preprocessing import LabelEncoder

columns = ['Gender' ,'Severity' ,'History' , 'Patient','TakeMedication', 'BreathShortness',
          'VisualChanges','NoseBleeding','ControlledDiet','Stages']

label_encoder = LabelEncoder()
for col in columns:
    df[col] = label_encoder.fit_transform(df[col])
```

Feature Engineering	Attached the codes in final submission.
Save Processed Data	-