Understanding Heart Attack Risk: Analyzing Key Factors from the Dataset

Introduction to Heart Attack Risk

In this presentation, we will explore **heart attack risk** by analyzing various **key factors** from our dataset. Understanding these factors can help in **preventive measures** and improving overall heart health. Let's dive into the data and uncover important insights.

Age and Gender Influence

Both **age** and **gender** are critical in assessing heart attack risk. Generally, older individuals and males are at a higher risk. This slide will analyze how these demographics affect heart health and the importance of targeted interventions for different groups.

Dataset Collection

Dataset was collected from Kaggle.com

https://www.kaggle.com/datasets/waqi786/heart-attack-dataset

About Dataset
This dataset provides a comprehensive overview of various factors associated with heart attack risks. It includes detailed information on patients' medical history, lifestyle habits, and physiological measurements.

Dataset Representation

Gender	Age	Blood Pres	Cholester	DIABETES_	Smoking St	Chest Pain	Treatment
Male	70	181	262	0	Never	Typical An	Lifestyle Changes
Female	55	103	253	1	Never	Atypical Ar	Angioplasty
Male	42	95	295	1	Current	Typical An	Angioplasty
Male	84	106	270	0	Never	Atypical Ar	Coronary Artery Bypass Graft (CABG)
Male	86	187	296	1	Current	On-anginal	Medication
Female	66	125	271	1	Former	Typical An	Coronary Artery Bypass Graft (CABG)
Male	33	181	262	1	Current	Asymptom	Lifestyle Changes
Male	84	182	288	0	Current	On-anginal	Lifestyle Changes
Male	73	115	286	1	Never	Asymptom	Angioplasty
Female	63	174	254	1	Former	On-anginal	Angioplasty
Male	88	154	150	0	Former	Atypical Ar	Medication
Male	69	133	236	0	Former	Typical An	Coronary Artery Bypass Graft (CABG)
Male	78	165	171	0	Former	On-anginal	Lifestyle Changes
Male	89	153	215	1	Current	Atypical Ar	Angioplasty
Female	71	110	182	1	Former	Typical An	Medication
Male	30	107	242	1	Current	Typical An	Lifestyle Changes
Female	77	112	179	0	Current	On-anginal	Angioplasty
Female	86	91	254	1	Current	Typical An	Lifestyle Changes
Female	76	101	227	1	Former	On-anginal	Medication
Male	74	125	259	0	Never	Typical An	Medication
Female	45	141	273	0	Never	Asymptom	Lifestyle Changes
Male	88	124	212	0	Former	Atypical Ar	Coronary Artery Bypass Graft (CABG)
Female	34	109	222	0	Never	Asymptom	Lifestyle Changes
Female	77	143	285	0	Never	On-anginal	Angioplasty
Female	45	153	266	1	Current	Asymptom	Coronary Artery Bypass Graft (CABG)

Why i have considered Heart attack as my Problem statement ?

1.High Mortality Rate
2.Widespread Prevalence
3.Economic Costs
4.Urgency of Response
5.Global Public Health Challenge
6.Psychological and Social Impact
7.Need for Research and Innovation

Given the severe health implications, the widespread impact, and the potential for prevention, heart attacks are a major problem statement in public health and healthcare. Addressing this issue involves complex, multifaceted approaches that span clinical care, public health initiatives, research, and policy-making.

Major Steps in my project

```python
import pandas as pd
import matplotlib.pyplot as plt
df=pd.read_csv("Rename.csv")
df
```

	Gender	Age	Blood Pressure (mmHg)	Cholesterol (mg/dL)	DIABETES_HAS	Smoking Status	Chest Pain Type	Treatment
0	Male	70	181	262	0	Never	Typical Angina	Lifestyle Changes
1	Female	55	103	253	1	Never	Atypical Angina	Angioplasty
2	Male	42	95	295	1	Current	Typical Angina	Angioplasty
3	Male	84	106	270	0	Never	Atypical Angina	Coronary Artery Bypass Graft (CABG)
4	Male	86	187	296	1	Current	0n-anginal Pain	Medication
...	...	...	...	...	...	...	...	...
995	Male	42	125	193	1	Current	Typical Angina	Angioplasty
996	Male	80	186	267	1	Never	Atypical Angina	Coronary Artery Bypass Graft (CABG)
997	Female	64	108	174	1	Current	0n-anginal Pain	Coronary Artery Bypass Graft (CABG)
998	Female	84	123	195	0	Current	Asymptomatic	Lifestyle Changes
999	Male	61	155	197	0	Former	Atypical Angina	Lifestyle Changes

```python
df.info(memory_usage="deep")
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1000 entries, 0 to 999
Data columns (total 8 columns):
 #   Column                 Non-Null Count   Dtype
---  ------                 --------------   -----
 0   Gender                 1000 non-null    object
 1   Age                    1000 non-null    int64
 2   Blood Pressure (mmHg)  1000 non-null    int64
 3   Cholesterol (mg/dL)    1000 non-null    int64
 4   DIABETES_HAS           1000 non-null    int64
 5   Smoking Status         1000 non-null    object
 6   Chest Pain Type        1000 non-null    object
 7   Treatment              1000 non-null    object
dtypes: int64(4), object(4)
memory usage: 265.2 KB
```

```
final=df.drop(['DIABETES_HAS','Gender','Smoking Status', 'Chest Pain Type', 'Treatment'],axis='columns'
final
```

	Age	Blood Pressure (mmHg)	Cholesterol (mg/dL)
0	70	181	262
1	55	103	253
2	42	95	295
3	84	106	270
4	86	187	296
5	66	125	271
6	33	181	262
7	84	182	288
8	73	115	286
9	63	174	254
10	88	154	150
11	69	133	236
12	78	165	171
13	89	153	215
14	71	110	182

```
print(df.columns)
```

```
Index(['Gender', 'Age', 'Blood Pressure (mmHg)', 'Cholesterol (mg/dL)',
       'DIABETES_HAS', 'Smoking Status', 'Chest Pain Type', 'Treatment'],
      dtype='object')
```

```
from sklearn.linear_model import LinearRegression
model=LinearRegression()
```

```
p=final
p
```

Final output and Accuracy of my Model

```
k=df.DIABETES_HAS
```

```
model.fit(p,k)
```

```
▼    LinearRegression  ⓘ ❓
LinearRegression()
```

```
model.predict([[70,185,295]])
```

```
C:\Users\pranj\AppData\Local\Programs\Python\Python312\Lib\site-packages\sklearn\base.py:493: UserWarning: X does not have valid feature names, but LinearRegression was fitted with feature names
  warnings.warn(
array([0.59341232])
```
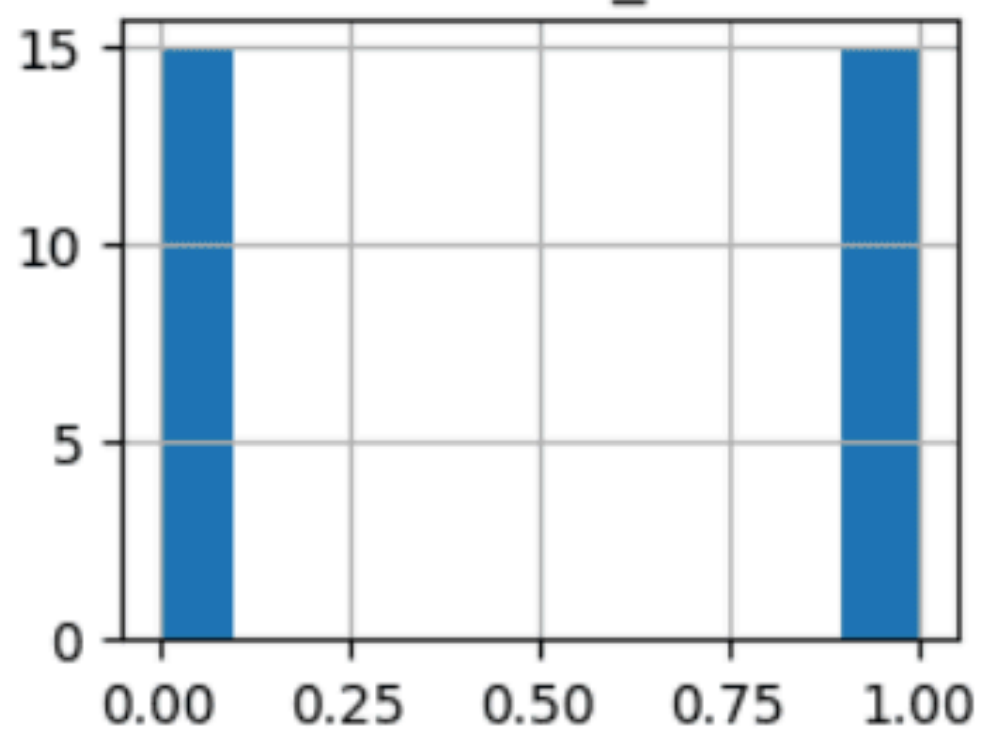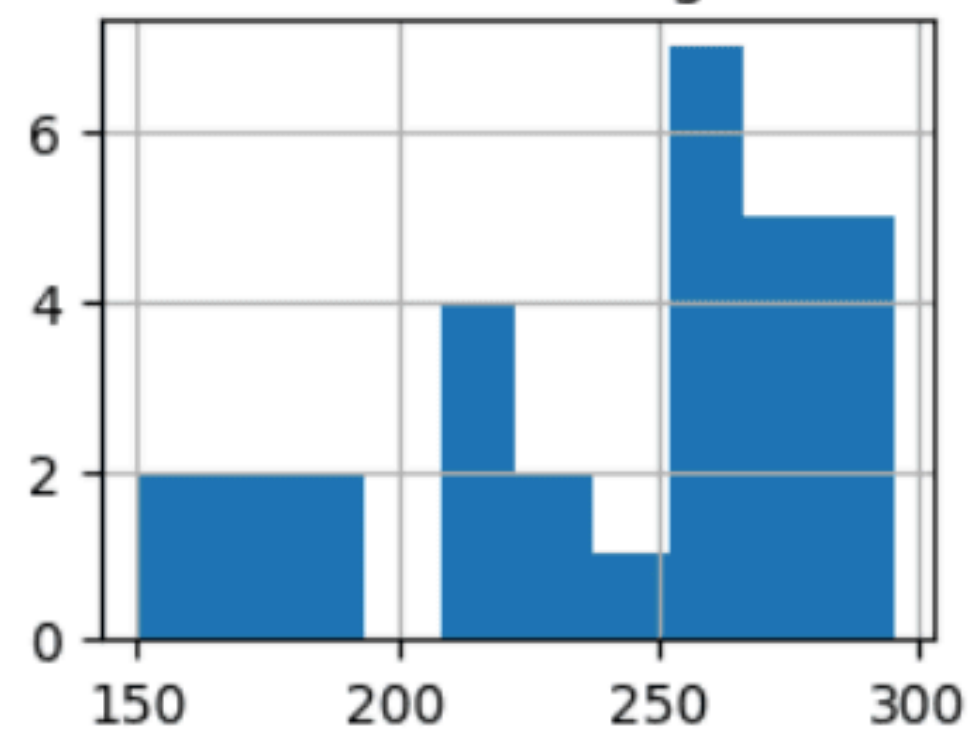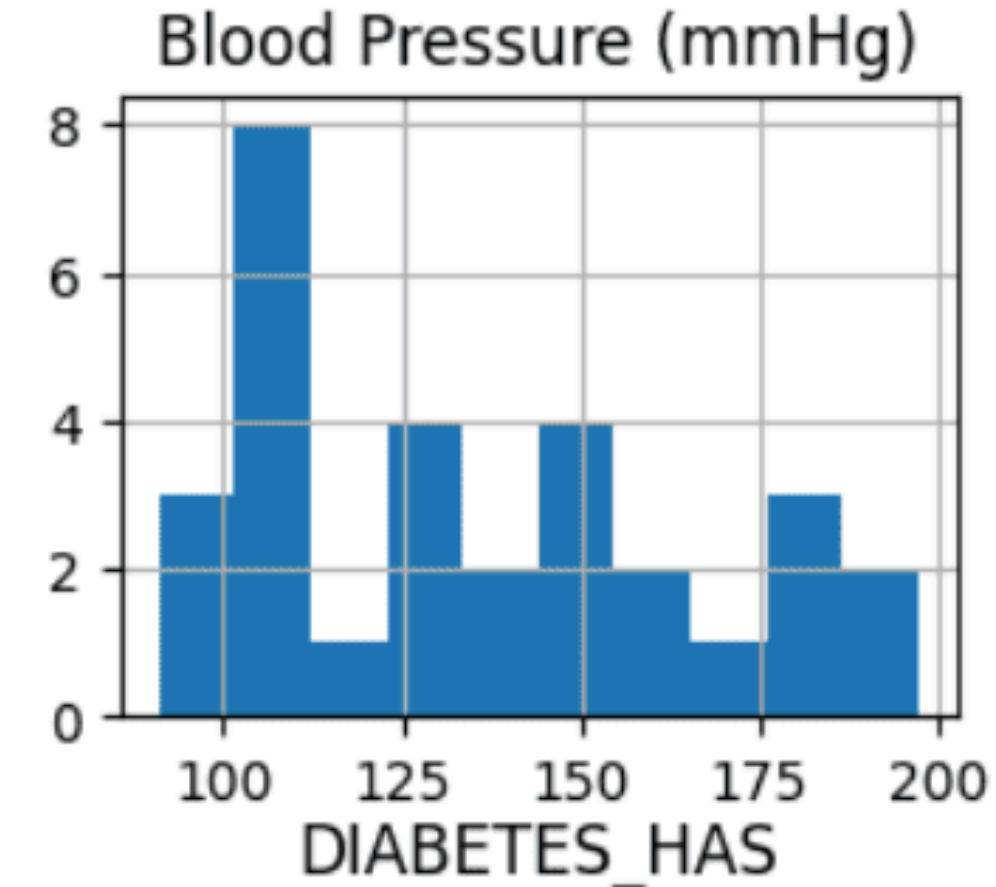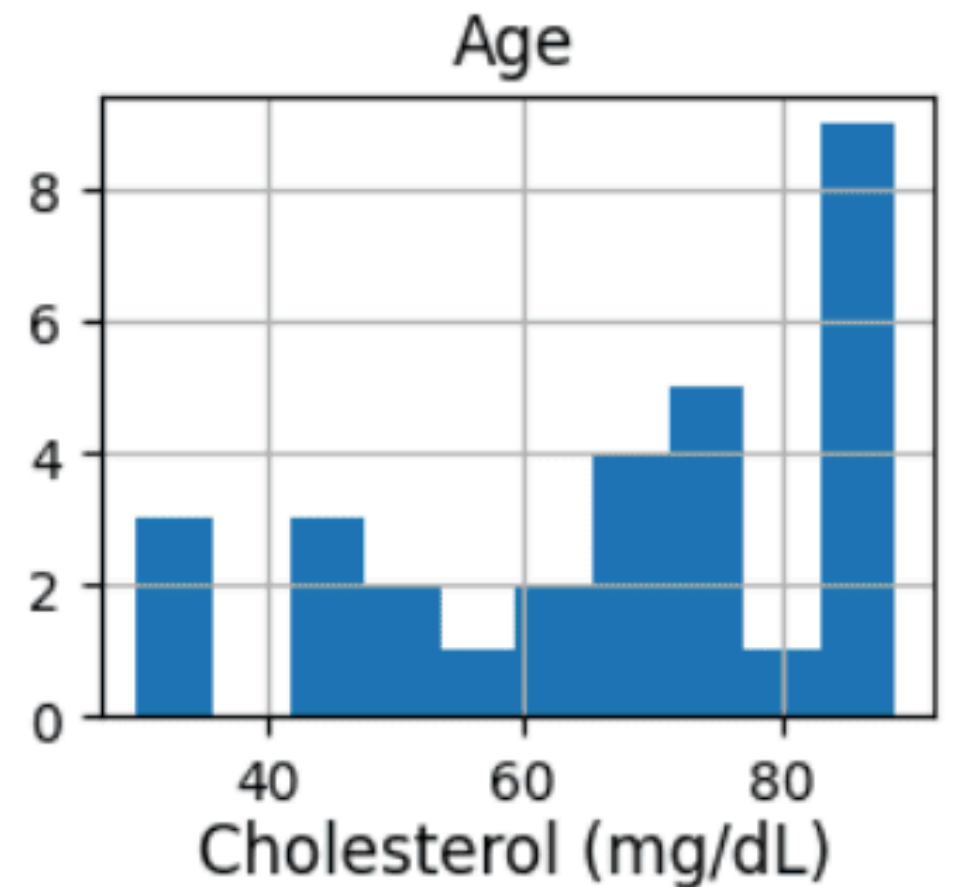
```
model.score(p,k)
```

```
0.0649930097879825
```

Graphs related to my Model

```
array([[<Axes: title={'center': 'Age'}>,
        <Axes: title={'center': 'Blood Pressure (mmHg)'}>],
       [<Axes: title={'center': 'Cholesterol (mg/dL)'}>,
        <Axes: title={'center': 'DIABETES_HAS'}>]], dtype=object)
```

Thanks!

Successfully Done By:
PRANJAL KUAMR DINDAYAL
23091A32B1
23091a32b1@rgmcet.edu.in