#Importing the necessary Libraries

In [ ]:

```
import pandas as pd
import matplotlib.pyplot as plt
```

Import the requried dataset

In [2]:

```
df=pd.read_csv('C:/Users/abhis/Documents/diabets.csv')
df
```

Out[2]:

	Pregnancies	Glucose	BloodPressure	SkinThickness	Insulin	BMI	DiabetesPedigreeFunction	Age	Outcome
0	6	148	72	35	0	33.6	0.627	50	1
1	1	85	66	29	0	26.6	0.351	31	0
2	8	183	64	0	0	23.3	0.672	32	1
3	1	89	66	23	94	28.1	0.167	21	0
4	0	137	40	35	168	43.1	2.288	33	1
...	...	...	...	...	...	...	...	...	...
763	10	101	76	48	180	32.9	0.171	63	0
764	2	122	70	27	0	36.8	0.340	27	0
765	5	121	72	23	112	26.2	0.245	30	0
766	1	126	60	0	0	30.1	0.349	47	1
767	1	93	70	31	0	30.4	0.315	23	0

768 rows × 9 columns

In [4]:

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 768 entries, 0 to 767
Data columns (total 9 columns):
 #   Column                    Non-Null Count  Dtype  
---  ------                    --------------  -----  
 0   Pregnancies               768 non-null    int64  
 1   Glucose                   768 non-null    int64  
 2   BloodPressure             768 non-null    int64  
 3   SkinThickness             768 non-null    int64  
 4   Insulin                   768 non-null    int64  
 5   BMI                       768 non-null    float64
 6   DiabetesPedigreeFunction  768 non-null    float64
 7   Age                       768 non-null    int64  
 8   Outcome                   768 non-null    int64  
dtypes: float64(2), int64(7)
memory usage: 54.1 KB
```

In [5]:

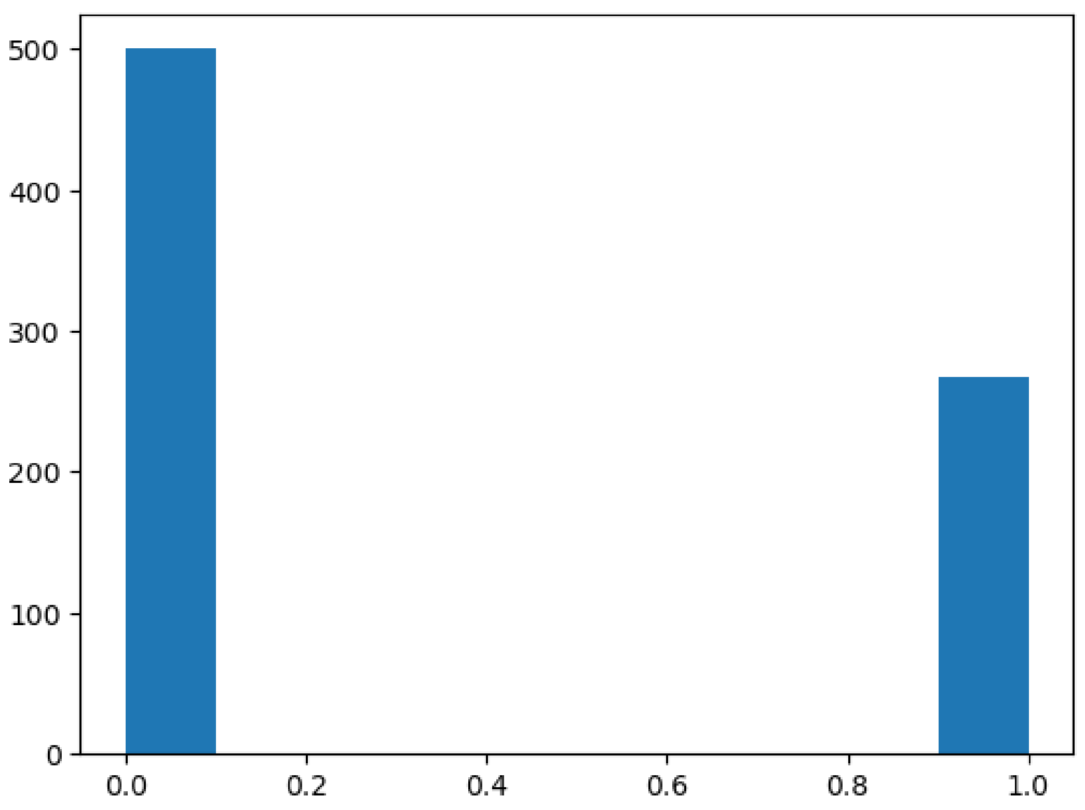
```
df.isnull().sum()
```

Out[5]:

```
Pregnancies                 0
Glucose                     0
BloodPressure               0
SkinThickness               0
Insulin                     0
BMI                         0
DiabetesPedigreeFunction    0
Age                         0
Outcome                     0
dtype: int64
```

In [23]:

```
plt.hist(df["Outcome"])
plt.show()
```



In [7]:

```
x=df.drop(['Outcome'],axis=1)
x
```

Out[7]:

	Pregnancies	Glucose	BloodPressure	SkinThickness	Insulin	BMI	DiabetesPedigreeFunction	Age
0	6	148	72	35	0	33.6	0.627	50
1	1	85	66	29	0	26.6	0.351	31
2	8	183	64	0	0	23.3	0.672	32
3	1	89	66	23	94	28.1	0.167	21
4	0	137	40	35	168	43.1	2.288	33
...	...	...	...	...	...	...	...	...
763	10	101	76	48	180	32.9	0.171	63
764	2	122	70	27	0	36.8	0.340	27
765	5	121	72	23	112	26.2	0.245	30
766	1	126	60	0	0	30.1	0.349	47
767	1	93	70	31	0	30.4	0.315	23

768 rows × 8 columns

In [9]:

```
y=df.Outcome
y
```

Out[9]:

```
0      1
1      0
2      1
3      0
4      1
      ..
763    0
764    0
765    0
766    1
767    0
Name: Outcome, Length: 768, dtype: int64
```

Split the dataset

In [10]:

```
from sklearn.model_selection import train_test_split
xtrain,xtest,ytrain,ytest=train_test_split(x,y,test_size=0.15,random_state=100)
```

In [12]:

```
print("xtrain:", xtrain.shape)
print("xtest:", xtest.shape)
print("ytrain:", ytrain.shape)
print("ytest:", ytest.shape)
```

```
xtrain: (652, 8)
xtest: (116, 8)
ytrain: (652,)
ytest: (116,)
```

Decision Tree Classifier

In [13]:

```
from sklearn.tree import DecisionTreeClassifier
model=DecisionTreeClassifier()
model.fit(xtrain,ytrain)
y_pred=model.predict(xtest)
```

In [14]:

```
train_score=model.score(xtrain,ytrain)
print("train_score",train_score)
test_score=model.score(xtest,ytest)
print("test_score",test_score)
```

```
train_score 1.0
test_score 0.6551724137931034
```

In [15]:

```
model1=DecisionTreeClassifier(min_samples_split=10,min_impurity_decrease=0.005)
model1.fit(xtrain,ytrain)
print("train_accuracy=",model1.score(xtrain,ytrain))
print("test_accuracy=",model1.score(xtest,ytest))
```

```
train_accuracy= 0.8328220858895705
test_accuracy= 0.7327586206896551
```

RANDOM FOREST CALSSIFIER

In [17]:

```
from sklearn.ensemble import RandomForestClassifier
model=RandomForestClassifier()
model.fit(xtrain,ytrain)
y_pred=model.predict(xtest)
```

In [18]:

```
train_score=model.score(xtrain,ytrain)
print("train_score",train_score)
test_score=model.score(xtest,ytest)
print("test_score",test_score)
```

```
train_score 1.0
test_score 0.7327586206896551
```

In [19]:

```
model1=DecisionTreeClassifier(min_samples_split=10,min_impurity_decrease=0.005)
model1.fit(xtrain,ytrain)
print("train_accuracy=",model1.score(xtrain,ytrain))
print("test_accuracy=",model1.score(xtest,ytest))
```

```
train_accuracy= 0.8328220858895705
test_accuracy= 0.7327586206896551
```

confusion matrix

In [21]:

```
from sklearn.metrics import confusion_matrix
confusion_matrix(ytest,y_pred)
```

Out[21]:

```
array([[64, 11],
       [20, 21]], dtype=int64)
```

In [ ]: