```
#import pandas library
import pandas as pd
```

```
#loading dataset
df=pd.read_csv("/content/drive/My Drive/Colab Notebooks/diabetes_dataset.csv")
df.head()
```

	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

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

	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

```
#target variable
y=df.Outcome
y
```

```
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
```

```
from sklearn.tree import DecisionTreeClassifier # Import Decision Tree Classifier
from sklearn.model_selection import train_test_split # Import train_test_split function
x_train, x_test, y_train, y_test = train_test_split(x, y, test_size=0.2, random_state=1)


# Create Decision Tree classifer object
model = DecisionTreeClassifier()

# Train Decision Tree Classifer
model = model.fit(x_train,y_train)

#Predict the response for test dataset
y_pred = model.predict(x_test)
```

```
#Evaluation using Accuracy score
from sklearn import metrics #Import scikit-learn metrics module for accuracy calculation
print("Accuracy:",metrics.accuracy_score(y_test, y_pred)*100)
```

```
Accuracy: 67.53246753246754
```

```
#Evaluation using Confusion matrix
from sklearn.metrics import confusion_matrix
confusion_matrix(y_test,y_pred)
```

```
array([[76, 23],
       [27, 28]])
```

```
print("Accuracy:",((82+27)/154))
```

```
Accuracy: 0.7077922077922078
```

```
#Evaluation using Classification report
from sklearn.metrics import classification_report
print(classification_report(y_test,y_pred))
```

```
                  precision    recall  f1-score   support

               0       0.74      0.77      0.75        99
               1       0.55      0.51      0.53        55

        accuracy                           0.68       154
       macro avg       0.64      0.64      0.64       154
    weighted avg       0.67      0.68      0.67       154
```

```
#checking prediction value
model.predict([[6,148,72,35,0,33.6,0.627,50]])
```

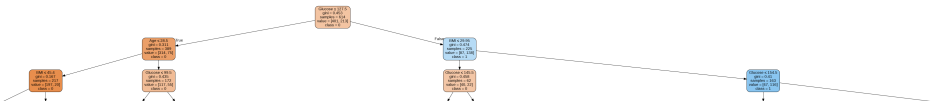
```
array([1])
```

```
#Import modules for Visualizing Decision trees
from sklearn.tree import export_graphviz
from sklearn.externals.six import StringIO
from IPython.display import Image
import pydotplus
```

```
features=x.columns
features
```

```
Index(['Pregnancies', 'Glucose', 'BloodPressure', 'SkinThickness', 'Insulin',
       'BMI', 'DiabetesPedigreeFunction', 'Age'],
      dtype='object')
```

```
dot_data = StringIO()
export_graphviz(model, out_file=dot_data,filled=True, rounded=True,special_characters=True,feature_names = features,class_names=['0','1
graph = pydotplus.graph_from_dot_data(dot_data.getvalue())
graph.write_png('diabetes_set.png')
Image(graph.create_png())
```



```
# Create Decision Tree classifer object
model = DecisionTreeClassifier(criterion="entropy", max_depth=3)

# Train Decision Tree Classifer
model = model.fit(x_train,y_train)

#Predict the response for test dataset
y_pred = model.predict(x_test)

# Model Accuracy
print("Accuracy:",metrics.accuracy_score(y_test, y_pred)*100)
```

```
Accuracy: 79.87012987012987
```

The classification rate increased to 79.87%, which is better accuracy than the previous model.

```
#Better Decision Tree Visualisation
from sklearn.externals.six import StringIO
from IPython.display import Image
from sklearn.tree import export_graphviz
import pydotplus
dot_data = StringIO()
export_graphviz(model, out_file=dot_data,filled=True, rounded=True,special_characters=True, feature_names = features,class_names=['0','1
graph = pydotplus.graph_from_dot_data(dot_data.getvalue())
graph.write_png('diabetes_set.png')
Image(graph.create_png())
```