The PIMA Indian Diabetes dataset is a widely used dataset for practicing machine learning and data analysis. It contains various health-related features to predict the onset of diabetes in PIMA Indian women.

Machine Learning for Predictive Modeling (Using Scikit-Learn):

```
import pandas as pd

from sklearn.model_selection import train_test_split

from sklearn.ensemble import RandomForestClassifier

from sklearn.metrics import accuracy_score, classification_report


# Assuming 'pima_data.csv' is the dataset file

pima_data = pd.read_csv('diabetes.csv')


# Split data into features (X) and target (y)

X = pima_data.drop('Outcome', axis=1)

y = pima_data['Outcome']


# Split data into training and testing sets

X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2,
random_state=42)


# Initialize and train a Random Forest Classifier

model = RandomForestClassifier(n_estimators=100, random_state=42)

model.fit(X_train, y_train)


# Predict outcomes on the test set

y_pred = model.predict(X_test)
```

```
# Evaluate the model
accuracy = accuracy_score(y_test, y_pred)
report = classification_report(y_test, y_pred)

print(f'Accuracy: {accuracy}')
print(f'Classification Report:\n{report}')
```

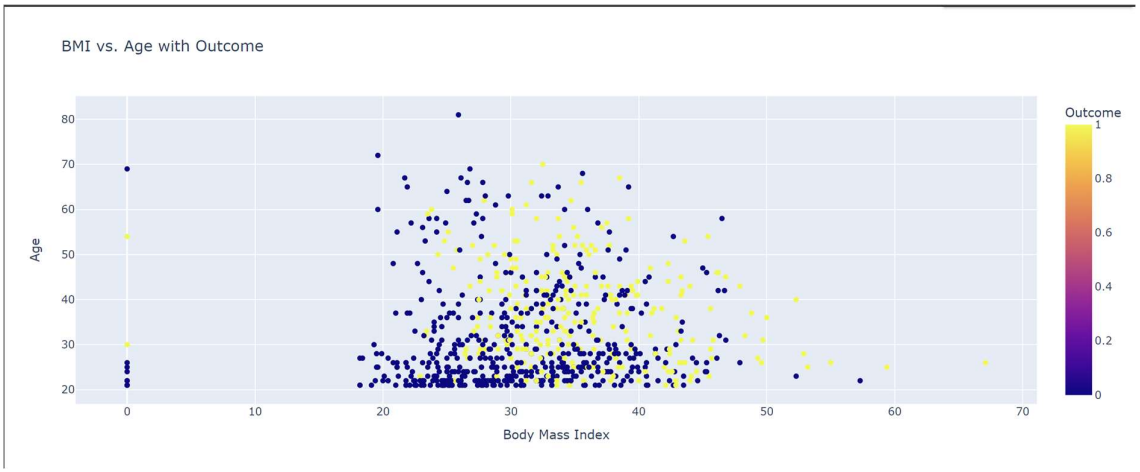
OUTPUT:

```
Classification Report:
              precision    recall  f1-score   support

           0       0.79      0.78      0.78        99
           1       0.61      0.62      0.61        55

    accuracy                           0.72       154
   macro avg       0.70      0.70      0.70       154
weighted avg       0.72      0.72      0.72       154
```

Data Visualization with Plotly:

```
import plotly.express as px
import pandas as pd
pima_data = pd.read_csv("diabetes.csv")
fig = px.scatter(pima_data, x='BMI', y='Age', color='Outcome',
                 labels={'BMI': 'Body Mass Index', 'Age': 'Age'},
                 title='BMI vs. Age with Outcome')
fig.show()
```

OUTPUT:


BMI vs. Age with Outcome
Age
Body Mass Index
Outcome
80
70
60
50
40
30
20
0
10
20
30
40
50
60
70
1
0.8
0.6
0.4
0.2
0