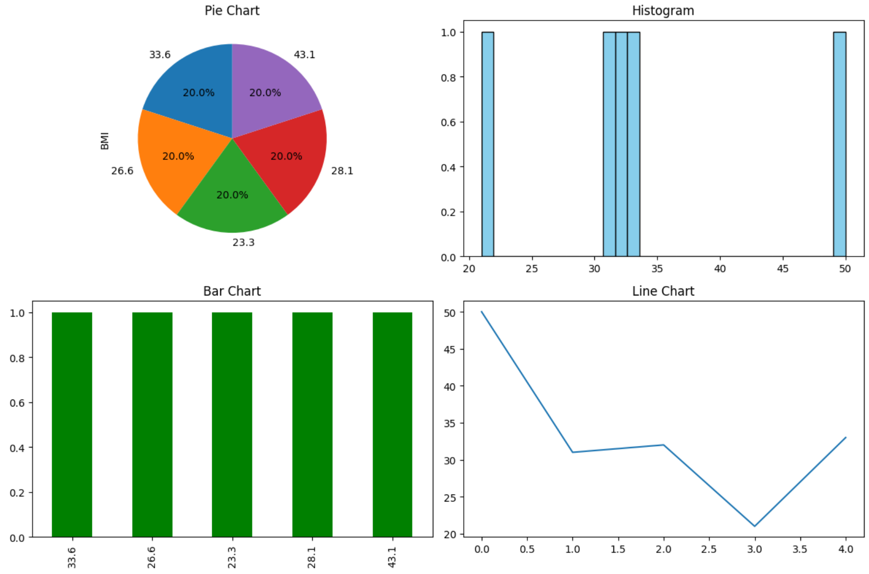
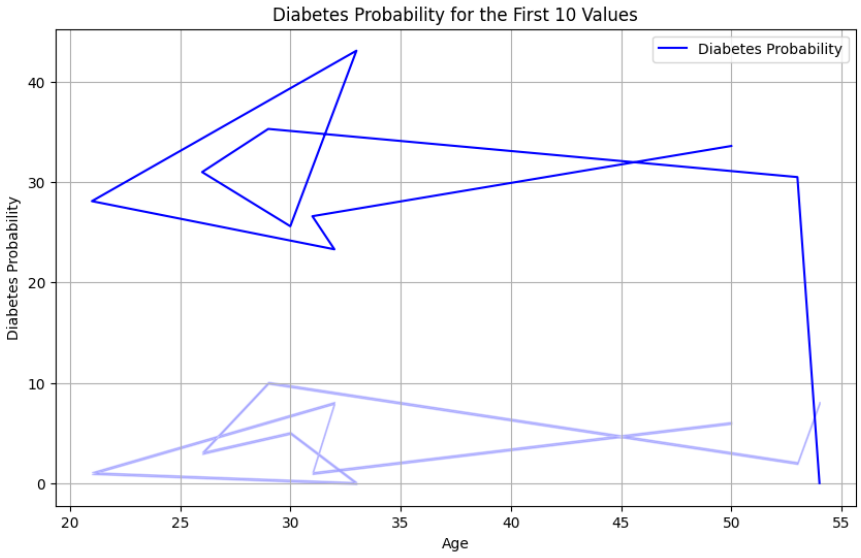
```
import pandas as pd
import matplotlib.pyplot as plt

# Load your dataset
# Replace 'your_dataset.csv' with the actual file path or URL of your dataset
df = pd.read_csv('diabetes.csv').head()

# Pie Chart
plt.figure(figsize=(12, 8))
plt.subplot(2, 2, 1)
df['BMI'].value_counts().plot.pie(autopct='%1.1f%%', startangle=90)
plt.title('Pie Chart')

# Histogram
plt.subplot(2, 2, 2)
plt.hist(df['Age'], bins=30, color='skyblue', edgecolor='black')
plt.title('Histogram')

# Bar Chart
plt.subplot(2, 2, 3)
df['BMI'].value_counts().plot(kind='bar', color='green')
plt.title('Bar Chart')

# Line Chart
plt.subplot(2, 2, 4)
plt.plot(df['Age'], label='Line Chart')
plt.title('Line Chart')

# Adjust layout to prevent overlapping
plt.tight_layout()

# Show the plots
plt.show()
```

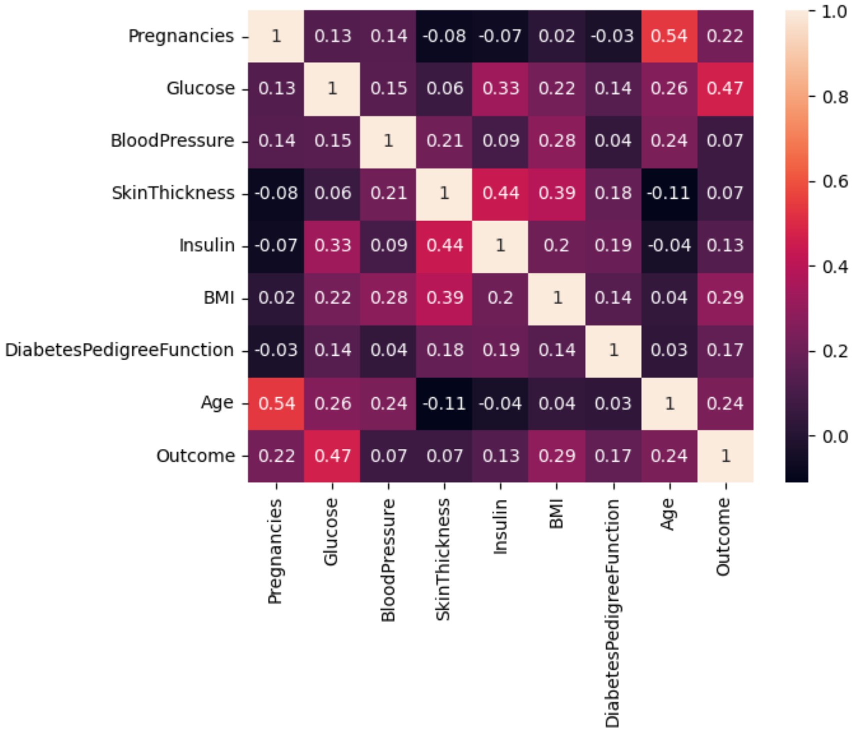


```
import matplotlib.pyplot as plt
import pandas as pd
df = pd.read_csv('diabetes.csv')
# Take only the first 10 values
subset_df = df.head(10)
# Create the plot
plt.figure(figsize=(10, 6))
plt.plot(subset_df['Age'], subset_df['BMI'], label='Diabetes Probability', color='blue')
plt.fill_between(subset_df['Age'], subset_df['Pregnancies'] - 0.1, subset_df['Pregnancies'] + 0.1, color='blue', alpha=0.2)
# Adding labels and title
plt.xlabel('Age')
plt.ylabel('Diabetes Probability')
plt.title('Diabetes Probability for the First 10 Values')
# Display the plot
plt.grid(True)
plt.legend()
plt.show()
```



```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.model_selection import train_test_split
from sklearn.preprocessing import StandardScaler
from sklearn.metrics import confusion_matrix, classification_report
data = pd.read_csv('diabetes.csv')
print("The shape of dataset:")
print(data.shape)
print("Displaying first 5 rows of dataset:")
print(data.head())
print("Describing dataset:")
print(data.describe())
correlation_matrix = data.corr().round(2)
print("The heatmap for datset:")
sns.heatmap(data=correlation_matrix, annot=True)
plt.show()
```

```
The shape of dataset:
(768, 9)
Displaying first 5 rows of dataset:
   Pregnancies  Glucose  BloodPressure  SkinThickness  Insulin   BMI  \
0            6      148             72             35        0  33.6
1            1       85             66             29        0  26.6
2            8      183             64              0        0  23.3
3            1       89             66             23       94  28.1
4            0      137             40             35      168  43.1

   DiabetesPedigreeFunction  Age  Outcome
0                     0.627   50        1
1                     0.351   31        0
2                     0.672   32        1
3                     0.167   21        0
4                     2.288   33        1
Describing dataset:
       Pregnancies     Glucose  BloodPressure  SkinThickness     Insulin  \
count   768.000000  768.000000     768.000000     768.000000  768.000000
mean      3.845052  120.894531      69.105469      20.536458   79.799479
std       3.369578   31.972618      19.355807      15.952218  115.244002
min       0.000000    0.000000       0.000000       0.000000    0.000000
25%       1.000000   99.000000      62.000000       0.000000    0.000000
50%       3.000000  117.000000      72.000000      23.000000   30.500000
75%       6.000000  140.250000      80.000000      32.000000  127.250000
max      17.000000  199.000000     122.000000      99.000000  846.000000

              BMI  DiabetesPedigreeFunction         Age     Outcome
count  768.000000                768.000000  768.000000  768.000000
mean    31.992578                  0.471876   33.240885    0.348958
std      7.884160                  0.331329   11.760232    0.476951
min      0.000000                  0.078000   21.000000    0.000000
25%     27.300000                  0.243750   24.000000    0.000000
50%     32.000000                  0.372500   29.000000    0.000000
75%     36.600000                  0.626250   41.000000    1.000000
max     67.100000                  2.420000   81.000000    1.000000
The heatmap for datset:
```



```
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.preprocessing import StandardScaler
from sklearn.ensemble import RandomForestClassifier
from sklearn.metrics import accuracy_score, classification_report
import xgboost as xgb
data = pd.read_csv('diabetes.csv')
X = data.drop('Glucose', axis=1)
y = data['Age']
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)
scaler = StandardScaler()
X_train = scaler.fit_transform(X_train)
X_test = scaler.transform(X_test)
model = RandomForestClassifier(n_estimators=100, random_state=42)
model.fit(X_train, y_train)
predictions = model.predict(X_test)
accuracy = accuracy_score(y_test, predictions)
print(f"Accuracy: {accuracy:.2f}")
print("Classification Report:\n", classification_report(y_test, predictions))
```

```
          23       1.00      0.86      0.92         7
          24       0.90      0.90      0.90        10
          25       0.89      1.00      0.94         8
          26       0.43      1.00      0.60         3
          27       0.43      0.60      0.50         5
          28       0.46      0.67      0.55         9
          29       0.38      0.30      0.33        10
          30       0.50      0.25      0.33         4
          31       0.00      0.00      0.00         3
          32       0.25      0.25      0.25         4
          33       0.00      0.00      0.00         2
          34       0.25      0.50      0.33         2
          35       0.00      0.00      0.00         0
          36       0.33      0.25      0.29         4
          37       0.33      0.33      0.33         3
          38       0.00      0.00      0.00         6
          39       0.00      0.00      0.00         4
          40       0.00      0.00      0.00         2
          41       0.29      0.67      0.40         3
          42       0.17      0.25      0.20         4
          43       0.50      0.50      0.50         4
          44       0.00      0.00      0.00         3
          45       0.33      1.00      0.50         2
          47       0.00      0.00      0.00         0
          48       0.00      0.00      0.00         1
          49       0.00      0.00      0.00         1
          50       0.50      0.50      0.50         2
          51       0.00      0.00      0.00         1
          53       0.00      0.00      0.00         2
          54       0.00      0.00      0.00         2
          55       0.00      0.00      0.00         1
          56       0.00      0.00      0.00         1
          57       0.00      0.00      0.00         1
          58       0.00      0.00      0.00         4
          60       0.00      0.00      0.00         3
          62       0.00      0.00      0.00         3
          63       0.00      0.00      0.00         2
          65       0.00      0.00      0.00         2
          67       0.00      0.00      0.00         1
          68       0.00      0.00      0.00         0

    accuracy                           0.49       154
   macro avg       0.24      0.28      0.25       154
weighted avg       0.46      0.49      0.47       154

/usr/local/lib/python3.10/dist-packages/sklearn/metrics/_classification.py:1344: UndefinedMetricWarning: Precision and F-score ar
  _warn_prf(average, modifier, msg_start, len(result))
/usr/local/lib/python3.10/dist-packages/sklearn/metrics/_classification.py:1344: UndefinedMetricWarning: Recall and F-score are i
  _warn_prf(average, modifier, msg_start, len(result))
/usr/local/lib/python3.10/dist-packages/sklearn/metrics/_classification.py:1344: UndefinedMetricWarning: Precision and F-score ar
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/usr/local/lib/python3.10/dist-packages/sklearn/metrics/_classification.py:1344: UndefinedMetricWarning: Recall and F-score are i
  _warn_prf(average, modifier, msg_start, len(result))
```
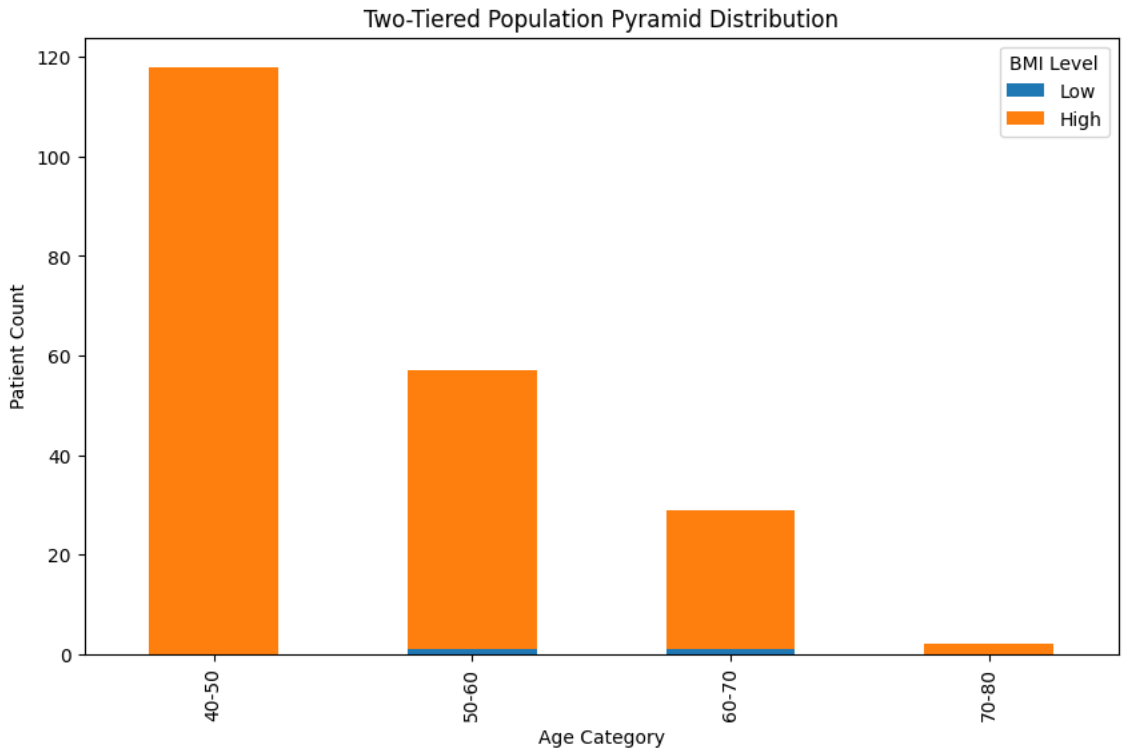
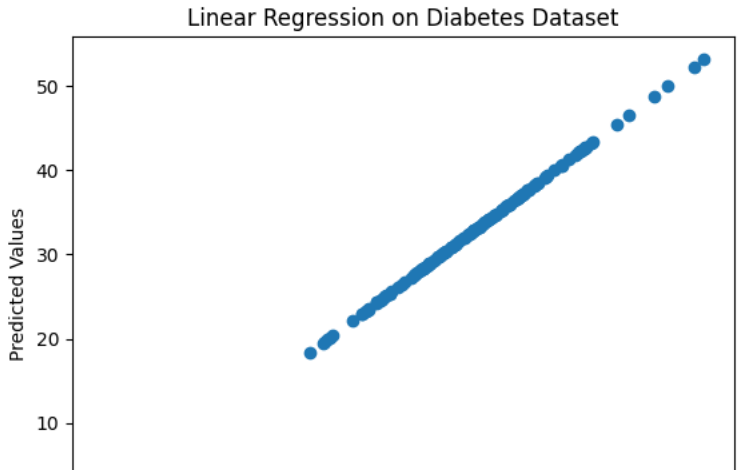

```
import pandas as pd
import pandas as pd
import matplotlib.pyplot as plt

# Load diabetes dataset from CSV file
data = pd.read_csv('diabetes.csv')

# Define age categories
age_bins = [40, 50, 60, 70, 80]
age_labels = ['40-50', '50-60', '60-70', '70-80']

# Categorize patients into age groups
data['AgeCategory'] = pd.cut(data['Age'], bins=age_bins, labels=age_labels, right=False)

# Define BMI threshold
BMI_threshold = 0.06

# Categorize patients into low/high BMI levels
data['BMILevel'] = pd.cut(data['BMI'], bins=[-float('inf'), BMI_threshold, float('inf')], labels=['Low', 'High'], right=False)

# Count patients for each age category and BMI level
age_BMI_counts = data.groupby(['AgeCategory', 'BMILevel']).size().unstack(fill_value=0)

# Count patients with complications for each age category, BMI level, and complication type
complication_counts = data[data['BloodPressure'] != 'No Complication'].groupby(['AgeCategory', 'BMILevel', 'BloodPressure']).size().unsta

# Plot stacked bar-population pyramid graph
fig, ax = plt.subplots(figsize=(10, 6))
age_BMI_counts.plot(kind='bar', stacked=True, ax=ax)
ax.set_title('Two-Tiered Population Pyramid Distribution')
ax.set_xlabel('Age Category')
ax.set_ylabel('Patient Count')
plt.legend(title='BMI Level', loc='upper right')
plt.show()
```



```
# Import necessary libraries
import numpy as np
import matplotlib.pyplot as plt
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LinearRegression
from sklearn.metrics import mean_squared_error
# Load the diabetes dataset from a CSV file
diabetes_df = pd.read_csv('/content/diabetes.csv')
# Assuming the target variable is named 'target'
X = diabetes_df.drop('Age', axis=1)
y = diabetes_df['BMI']
# Split the dataset 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)
# Create a linear regression model
model = LinearRegression()
# Train the model on the training set
model.fit(X_train, y_train)
# Make predictions on the test set
y_pred = model.predict(X_test)
# Evaluate the model performance
mse = mean_squared_error(y_test, y_pred)
print(f'Mean Squared Error: {mse}')
# Plot the predictions against the actual values
plt.scatter(y_test, y_pred)
plt.xlabel('Actual Values')
plt.ylabel('Predicted Values')
plt.title('Linear Regression on Diabetes Dataset')
plt.show()
```

```
Mean Squared Error: 2.2095479283677526e-29
```


Linear Regression on Diabetes Dataset
Predicted Values