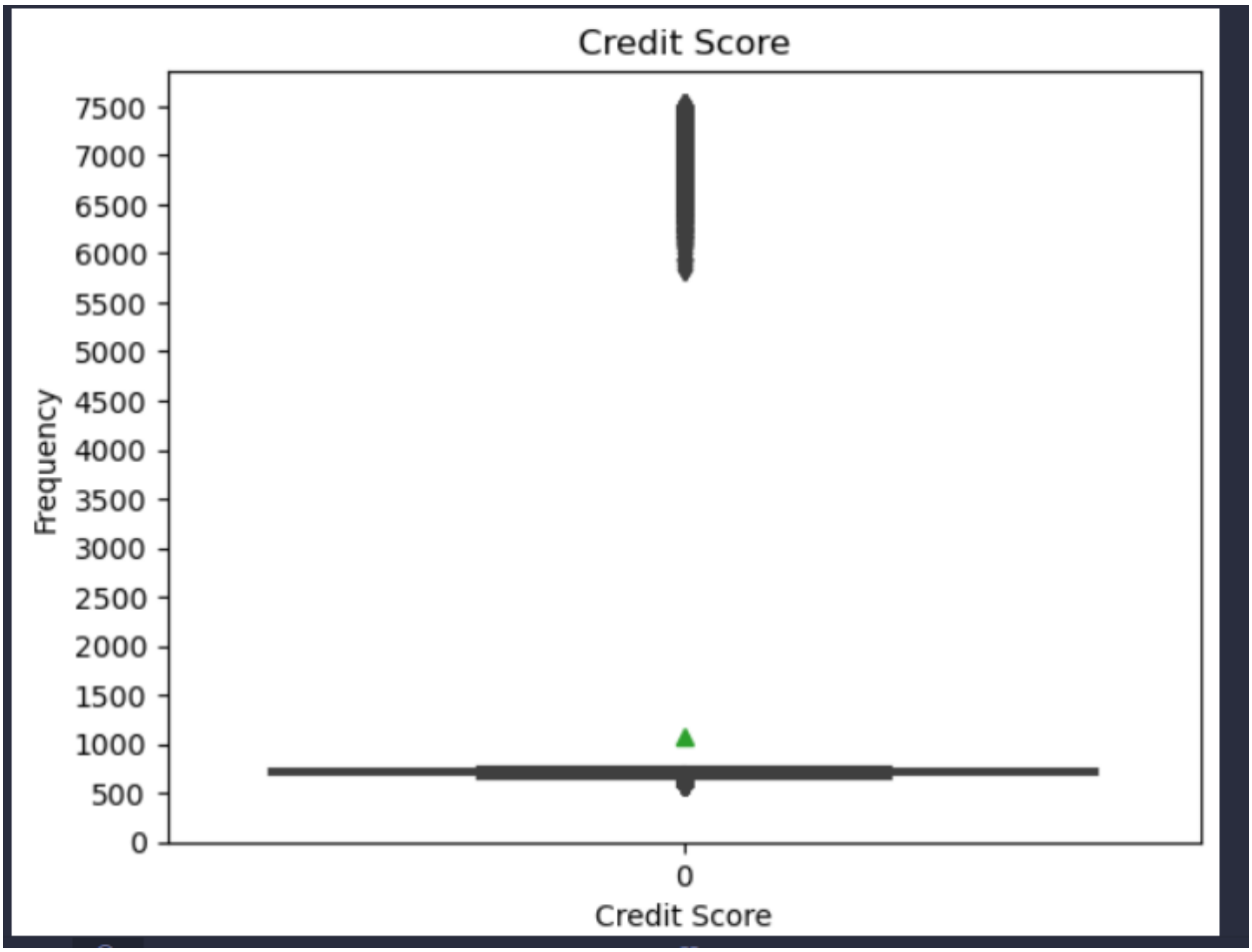
200797_Lab2

Task1

```python
import pandas as pd

import matplotlib.pyplot as plt

import seaborn as sns

# Load the dataset
loangrant_df = pd.read_csv("loangrant.csv")

df = pd.DataFrame(loangrant_df)


# Create the boxplot
sns.boxplot(
    data=df["Credit Score"].tolist(),
    showmeans=True,  # Add mean line
)

# Customize the y-axis scale
plt.yticks(range(0, int(max(df["Credit Score"])) + 1, 500))
# Customize the plot (optional)
plt.xlabel("Credit Score")
plt.ylabel("Frequency")
plt.title("Credit Score")
plt.show()
```




```
# Outlier detection
Q1 = loangrant_df['Credit Score'].quantile(0.25)
Q3 = loangrant_df['Credit Score'].quantile(0.75)
IQR = Q3 - Q1
lower_bound = Q1 - 1.5 * IQR
upper_bound = Q3 + 1.5 * IQR
outliers = loangrant_df[(loangrant_df['Credit Score'] < lower_bound) |
(loangrant_df['Credit Score'] > upper_bound)]
print("Outliers:")
print(outliers['Credit Score'])
```

```
Outliers:
0         7280.0
1         7330.0
2         7240.0
3         7400.0
4         6860.0
           ...
111040     602.0
111052     644.0
111077     644.0
111097     635.0
111105     626.0
Name: Credit Score, Length: 7886, dtype: float64
```

Task 2 + Task 3

```python
# Handling missing values

# Replace missing values with appropriate central tendency
for column in loangrant_df.columns:
    if loangrant_df[column].dtype != 'object':
        if loangrant_df[column].isnull().sum() > 0:
            mean_val = loangrant_df[column].mean()
            median_val = loangrant_df[column].median()
            mode_val = loangrant_df[column].mode()[0]
            print(f"Column: {column}")
            print(f"Mean: {mean_val}, Median: {median_val}, Mode: {mode_val}")
            print("Replace missing values with median (justification: less
sensitive to outliers)")
            # Replace missing values with median (justification: less sensitive
to outliers)
            loangrant_df[column].fillna(median_val, inplace=True)

# Verify if there are any missing values left
print("Missing values after replacement:")
print(loangrant_df.isnull().sum())
```

```
Column: Credit Score
Mean: 1075.7950294645145, Median: 724.0, Mode: 747.0
Replace missing values with median (justification: less sensitive to outliers)
Column: Annual Income
Mean: 72485.9981842284, Median: 61752.0, Mode: 61188.0
Replace missing values with median (justification: less sensitive to outliers)
Column: Months since last delinquent
Mean: 34.90227237832028, Median: 32.0, Mode: 12.0
Replace missing values with median (justification: less sensitive to outliers)
Column: Bankruptcies
Mean: 0.11765979130403413, Median: 0.0, Mode: 0.0
Replace missing values with median (justification: less sensitive to outliers)
Column: Tax Liens
Mean: 0.02935299200691294, Median: 0.0, Mode: 0.0
Replace missing values with median (justification: less sensitive to outliers)
Missing values after replacement:
Loan ID                         0
Customer ID                     0
Loan Status                     0
Current Loan Amount             0
Term                            0
Credit Score                    0
```

```
Missing values after replacement:
Loan ID                         0
Customer ID                     0
Loan Status                     0
Current Loan Amount             0
Term                            0
Credit Score                    0
Years in current job         4693
Home Ownership                  0
Annual Income                   0
...
Maximum Open Credit             0
Bankruptcies                    0
Tax Liens                       0
dtype: int64
```

Task4

```
# Define the mapping for replacement
replacement_mapping = {
    '< 1 year': '< year',
    'n/a': '< year',
    '10+ years': 'above 10 years',
    '1 years': 'two-four years',
    '2 years': 'two-four years',
    '3 years': 'two-four years',
    '4 years': 'two-four years',
    '5 years': 'five-seven years',
    '6 years': 'five-seven years',
    '7 years': 'five-seven years',
    '8 years': 'eight-nine years',
    '9 years': 'eight-nine years',

}

# Replace values in the 'Year in current job' column
loangrant_df['Years in current job'] = loangrant_df['Years in current
job'].replace(replacement_mapping)

# Save the modified DataFrame to a new CSV file
loangrant_df.to_csv("updated_loangrant.csv", index=False)

print("Modified dataset saved to 'updated_loangrant.csv'")
```

```
Modified dataset saved to 'updated_loangrant.csv'
```