#Machine Learning Capstone Project - Credit Card Fraud Detection

##Project Title: ***Credit Card Fraud Detection***

##Problem Statement:

With the increasing prevalence of online transactions, ensuring the security of credit card transactions is very important. The objective of this project is to develop a robust machine learning model capable of accurately detecting fraudulent credit card transactions in real-time. Utilizing a dataset containing transaction details such as transaction amount, merchant category, cardholder information, transaction location, the aim is to build a predictive model that can effectively differentiate between legitimate and fraudulent transactions. By employing advanced machine learning algorithms and feature engineering techniques, the goal is to create a system that enhances fraud detection capabilities, thereby minimizing financial losses for both cardholders and financial institutions while maintaining a low false positive rate. Ultimately, this project seeks to contribute to the development of proactive measures for securing credit card transactions and safeguarding the financial interests of stakeholders in the digital economy.

##**Dataset Download:** https://raw.githubusercontent.com/ArchanaInsights/Datasets/refs/heads/main/credit_

[ ]:
```python
import pandas as pd

df = pd.read_csv('https://raw.githubusercontent.com/ArchanaInsights/Datasets/
↪refs/heads/main/credit_card_transactions.csv')
df.head()
```

[ ]:
```
  Transaction_ID         Card_Type Merchant_Category  Transaction_Amount  \
0       W963UK57        Mastercard      Utility bill             27214.0
1       V606KV56  American Express            Retail             83956.0
2       R531NU70              Visa    Transportation            193280.0
3       T783GF79             RuPay   Online Shopping            167381.0
4       K256ZN73             RuPay            Retail             81170.0

  Transaction_DateTime Location Region  Cardholder_Age Cardholder_Gender  \
0  2020-01-01 09:43:17    Patna   East            23.0            Female
1  2020-01-03 16:26:13    Surat   West            49.0              Male
2  2020-01-04 03:40:49    Patna   East             NaN              Male
3  2020-01-04 14:56:24    Surat   West            52.0            Female
4  2020-01-04 17:26:47  Lucknow  North            37.0            Female
```

```
   Cardholder_Monthly_Income  Cardholder_Average_Spend  Credit_Limit  \
0                    94632.0                  36369.65      100000.0
1                   148118.0                  89179.12      150000.0
2                   210921.0                 106668.60      200000.0
3                   148070.0                 173155.52      200000.0
4                   174470.0                  52713.09      200000.0

  Device_Type Day_of_Week Is_Fraudulent
0     Unknown   Wednesday            No
1     Desktop      Friday            No
2     Desktop    Saturday            No
3     Desktop    Saturday           Yes
4      Mobile    Saturday            No
```

[ ]:
```
df.tail()
```

[ ]:
```
     Transaction_ID         Card_Type Merchant_Category  Transaction_Amount  \
4995       N307EM82             RuPay         Education             36508.0
4996       J752EG45  American Express   Online Shopping             42920.0
4997       S4580S59              Visa        Healthcare             33788.0
4998       E863PD98             RuPay     Entertainment             38679.0
4999       D501WH15              Visa        Healthcare             34672.0

     Transaction_DateTime Location Region  Cardholder_Age Cardholder_Gender  \
4995  2023-12-29 09:22:23    Delhi  North            33.0            Female
4996  2023-12-29 19:59:13  Chennai  South             NaN            Female
4997  2023-12-30 07:06:38     Pune   West            56.0              Male
4998  2023-12-30 07:50:02  Chennai  South            60.0              Male
4999  2023-12-30 11:41:36   Jaipur  North            60.0               NaN

      Cardholder_Monthly_Income  Cardholder_Average_Spend  Credit_Limit  \
4995                    63015.0                  34192.55       50000.0
4996                        NaN                  19680.39      100000.0
4997                    60868.0                  33876.96       50000.0
4998                    66948.0                  32988.22       50000.0
4999                    58261.0                  39412.26       50000.0

                     Device_Type Day_of_Week Is_Fraudulent
4995  Contactless Payment Device      Friday           Yes
4996  Contactless Payment Device      Friday            No
4997                     Desktop    Saturday            No
4998                     Desktop    Saturday            No
4999                      Mobile    Saturday            No
```

[ ]:
```
df.shape
```

[ ]:
```
(5000, 15)
```

[ ]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 5000 entries, 0 to 4999
Data columns (total 15 columns):
 #   Column                       Non-Null Count  Dtype
---  ------                       --------------  -----
 0   Transaction_ID               5000 non-null   object
 1   Card_Type                    4983 non-null   object
 2   Merchant_Category            4978 non-null   object
 3   Transaction_Amount           4994 non-null   float64
 4   Transaction_DateTime         5000 non-null   object
 5   Location                     5000 non-null   object
 6   Region                       5000 non-null   object
 7   Cardholder_Age               4865 non-null   float64
 8   Cardholder_Gender            4911 non-null   object
 9   Cardholder_Monthly_Income    4686 non-null   float64
 10  Cardholder_Average_Spend     4792 non-null   float64
 11  Credit_Limit                 4991 non-null   float64
 12  Device_Type                  4960 non-null   object
 13  Day_of_Week                  5000 non-null   object
 14  Is_Fraudulent                5000 non-null   object
dtypes: float64(5), object(10)
memory usage: 586.1+ KB
```

[ ]:
```
df['Is_Fraudulent'].unique()
```

[ ]:
```
array(['No', 'Yes'], dtype=object)
```

#Project Steps and Objectives:

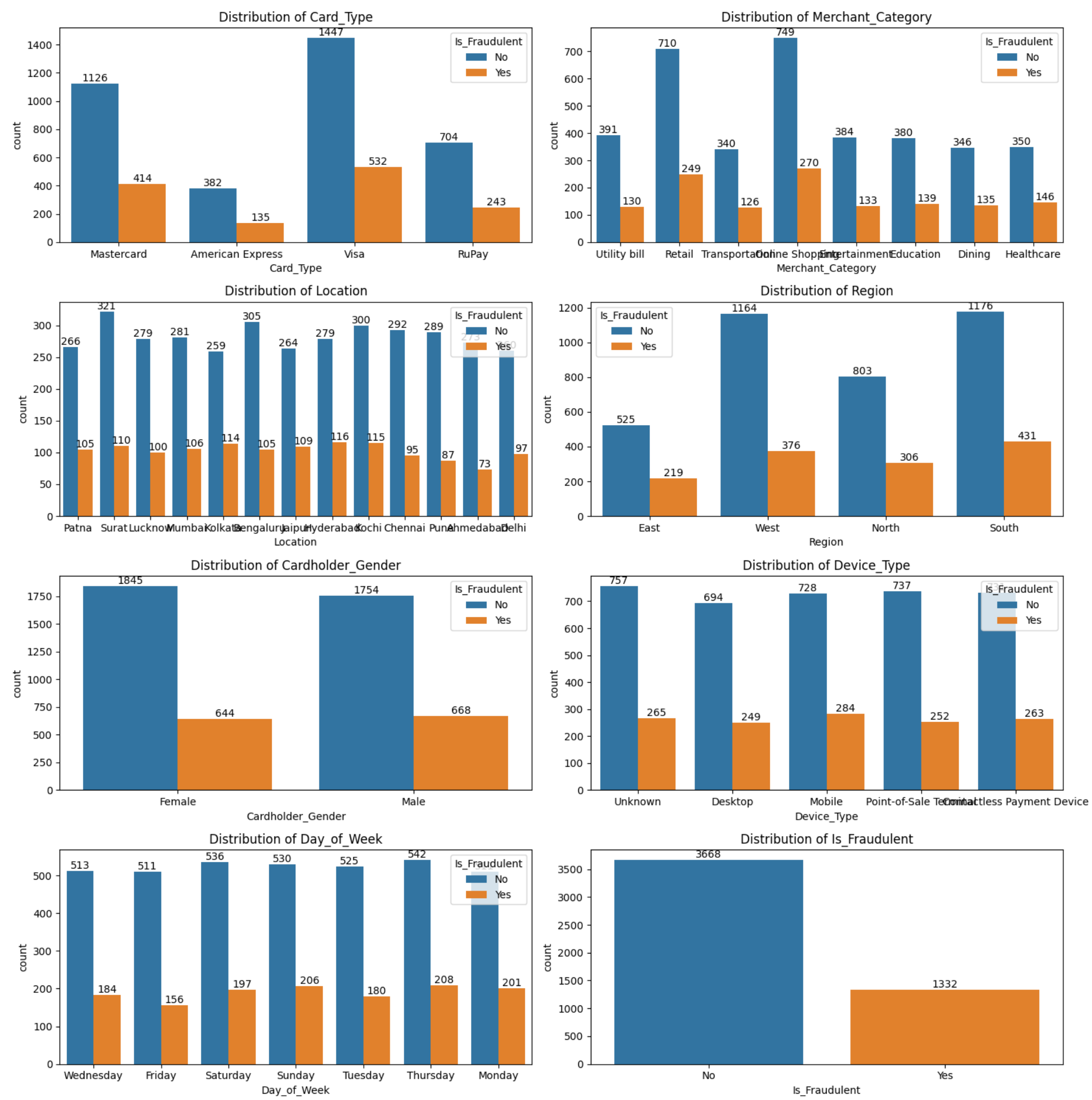
#1) Exploratory Data Analysis (EDA):

a) Analyze the distribution of categorical features such as **Card_Type, Merchant_Category, Location, etc.**

[ ]:
```
categorical_cols = df.select_dtypes('O').columns.to_list()
# Remove individual elements instead of a list
for col in ['Transaction_ID', 'Transaction_DateTime']:
    categorical_cols.remove(col)
print(categorical_cols)
print()
print(len(categorical_cols))
```

```
['Card_Type', 'Merchant_Category', 'Location', 'Region', 'Cardholder_Gender',
'Device_Type', 'Day_of_Week', 'Is_Fraudulent']

8
```

[ ]:
```
import matplotlib.pyplot as plt
import seaborn as sns

fig, axes = plt.subplots(nrows=4, ncols=2, figsize=(15, 15)) # 4X2 = 8
axes = axes.flatten()

for i, col in enumerate(categorical_cols):
    sns.countplot(x=col, hue='Is_Fraudulent', data=df, ax=axes[i]).
 ↪set_title(f'Distribution of {col}')
    for container in axes[i].containers:
        axes[i].bar_label(container)

plt.tight_layout()
plt.show()
```

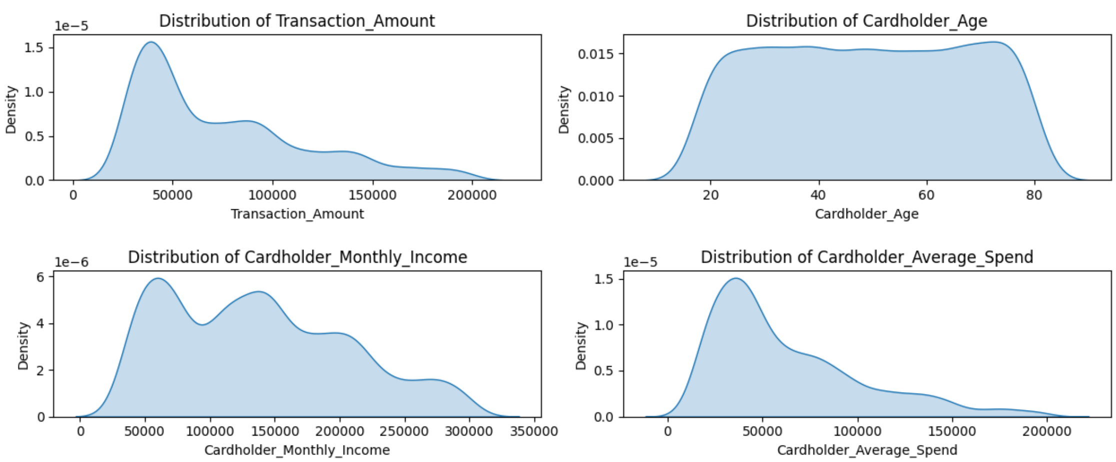


b) Explore numerical features like **Transaction_Amount, Cardholder_Age, Cardholder_Monthly_Income, and Cardholder_Average_Spend.** Use descriptive statistics to understand their central tendency and spread.

[ ]:
```
numerical_cols = df.select_dtypes(exclude='O').columns.to_list()
numerical_cols.remove('Credit_Limit')
numerical_cols
print(numerical_cols)
print()
print(len(numerical_cols))
```

```
['Transaction_Amount', 'Cardholder_Age', 'Cardholder_Monthly_Income',
'Cardholder_Average_Spend']

4
```

[ ]:
```
fig, axes = plt.subplots(nrows=2, ncols=2, figsize=(12, 5)) # 2x2 = 4
axes = axes.flatten()

for i, col in enumerate(numerical_cols):
    sns.kdeplot(data=df, x=col, ax=axes[i], fill=True).set_title(f'Distribution␣
 ↪of {col}')

plt.tight_layout()
plt.show()
```



[ ]:
```
df[numerical_cols].describe()
```

```
[ ]:        Transaction_Amount  Cardholder_Age  Cardholder_Monthly_Income  \
     count         4994.000000     4865.000000                4686.000000
     mean         74667.995995       49.106680              137353.817542
     std          43089.045623       18.398524               69471.623020
     min          25008.000000       18.000000               35005.000000
     25%          39742.500000       33.000000               73485.000000
     50%          60922.000000       49.000000              131833.000000
     75%          98373.500000       65.000000              189054.250000
     max         199923.000000       80.000000              299907.000000

            Cardholder_Average_Spend
     count               4792.000000
     mean               63058.343566
     std                40056.989704
     min                10282.410000
     25%                33336.742500
     50%                49547.945000
     75%                83732.352500
     max               199898.290000
```

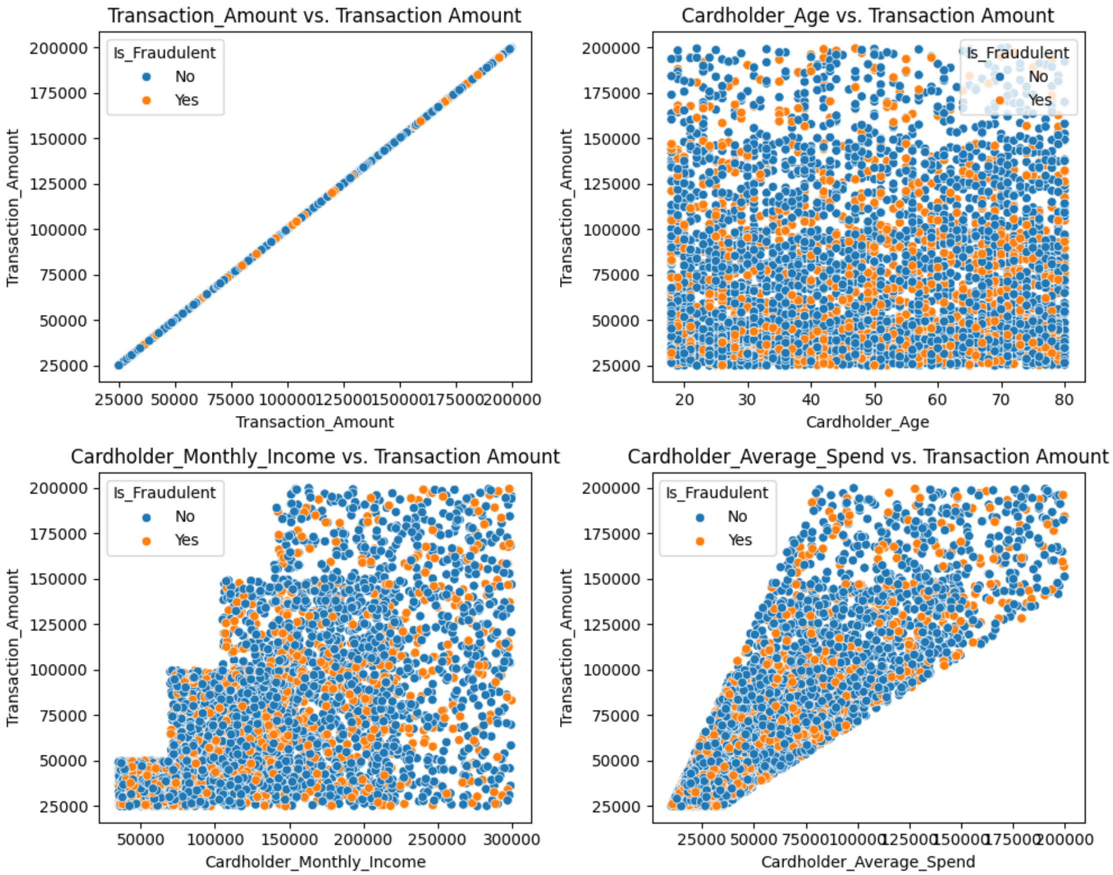
```
[ ]: skewness = df[numerical_cols].skew()
     skewness
```

```
[ ]: Transaction_Amount           0.968481
     Cardholder_Age              -0.009025
     Cardholder_Monthly_Income    0.428367
     Cardholder_Average_Spend     1.155050
     dtype: float64
```

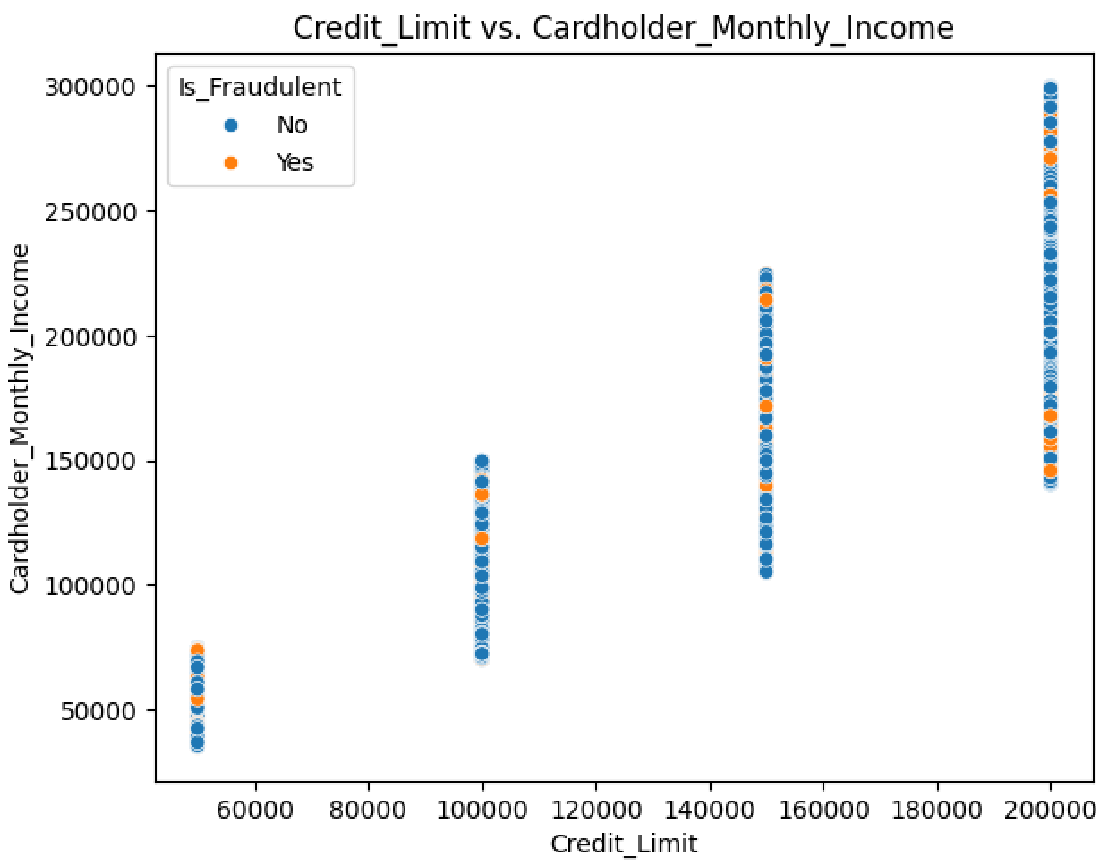
c) Conduct **bivariate and multivariate analysis** to identify potential relationships between the features as well as with the target variable **(Is_Fraudulent).**

Bivariate Analysis - Scatter Plot

```
[ ]: fig, axes = plt.subplots(nrows=2, ncols=2, figsize=(10, 8))
     axes = axes.flatten()

     for i, col in enumerate(numerical_cols[:4]):  # Adjust the range if needed
         sns.scatterplot(data=df, x=col, y='Transaction_Amount',␣
       ↪hue='Is_Fraudulent', ax=axes[i])
         axes[i].set_title(f'{col} vs. Transaction Amount')

     plt.tight_layout()
     plt.show()
```

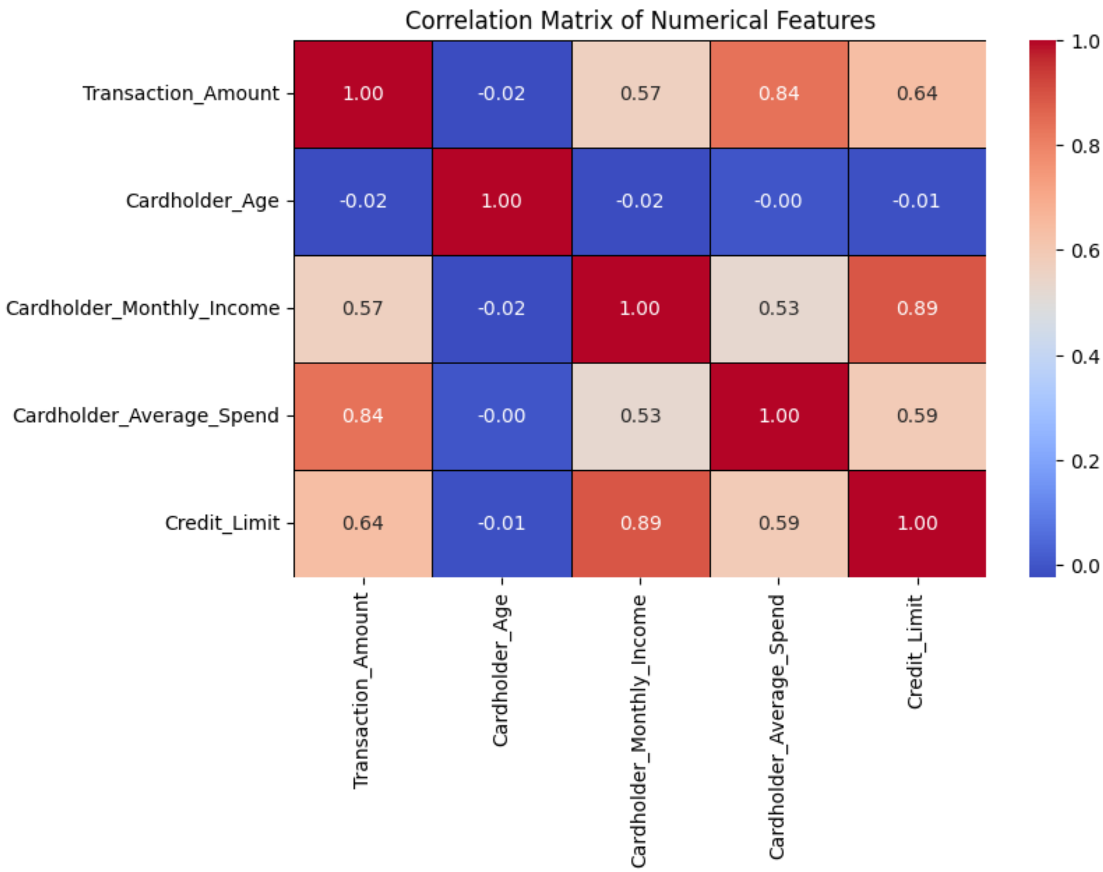


[ ]:
```
sns.scatterplot(data=df, x='Credit_Limit', y='Cardholder_Monthly_Income',␣
  ↪hue='Is_Fraudulent')
plt.tight_layout()
plt.title('Credit_Limit vs. Cardholder_Monthly_Income')
plt.show()
```



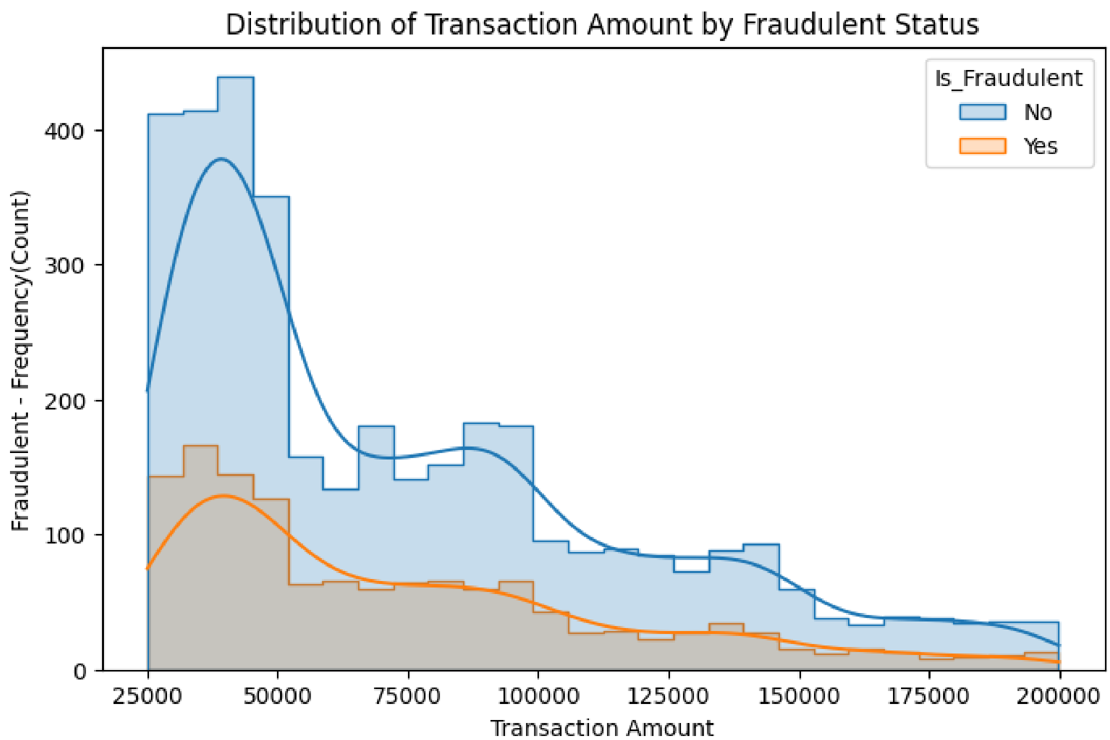
Multivariate Analysis - Heatmap

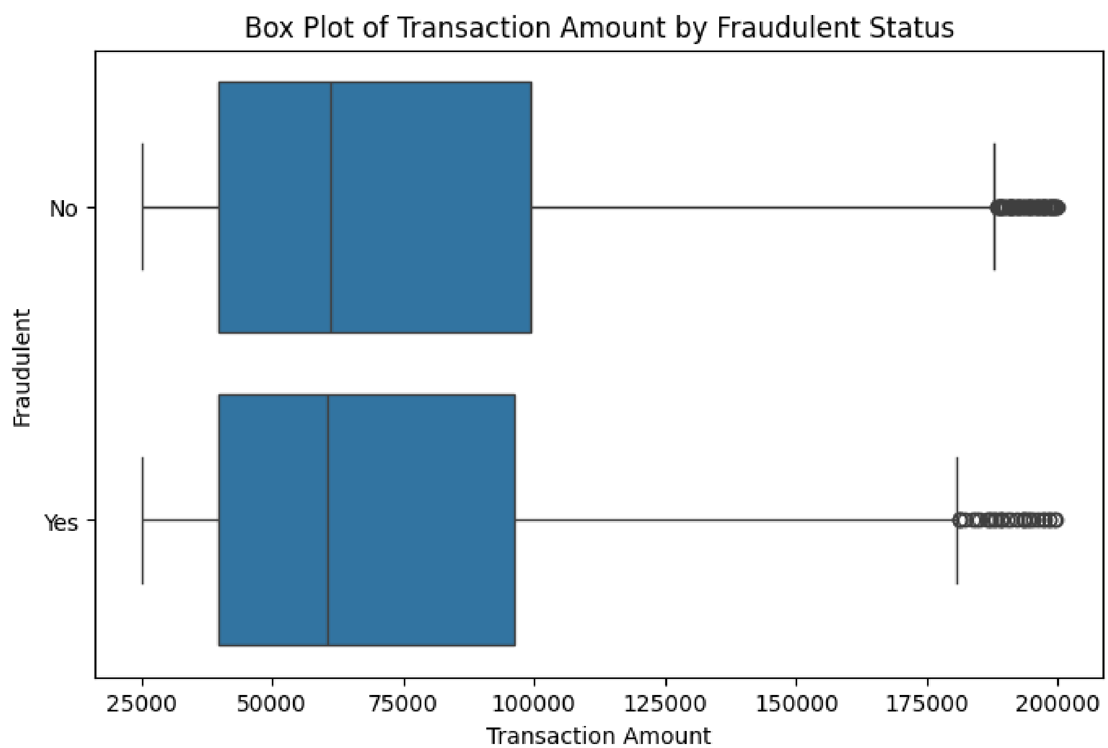
[ ]:
```
correlation_matrix = df.corr(numeric_only=True)  # Include only numerical␣
↪features
plt.figure(figsize=(8, 5))
sns.heatmap(correlation_matrix, annot=True, cmap='coolwarm', fmt=".2f",␣
↪linewidths=0.5, linecolor='black')
plt.title('Correlation Matrix of Numerical Features')
plt.show()
```



d) Visualize the distribution of **transaction amounts** for **fraudulent vs. non-fraudulent** transactions using **histograms or box plots.**

[ ]:
```
# Visualize transaction amount distribution for fraudulent vs. non-fraudulent␣
↪transactions
plt.figure(figsize=(8, 5))
sns.histplot(data=df, x='Transaction_Amount', hue='Is_Fraudulent', kde=True,␣
↪element="step")
plt.title('Distribution of Transaction Amount by Fraudulent Status')
plt.xlabel('Transaction Amount')
plt.ylabel('Fraudulent - Frequency(Count)')
plt.show()

plt.figure(figsize=(8, 5))
sns.boxplot(data=df, x='Transaction_Amount', y='Is_Fraudulent')
plt.title('Box Plot of Transaction Amount by Fraudulent Status')
plt.xlabel('Transaction Amount')
plt.ylabel('Fraudulent')
plt.show()
```


Distribution of Transaction Amount by Fraudulent Status
Is_Fraudulent
No
Yes
Fraudulent - Frequency(Count)
0
100
200
300
400
25000
50000
75000
100000
125000
150000
175000
200000
Transaction Amount


Box Plot of Transaction Amount by Fraudulent Status
Fraudulent
No
Yes
25000
50000
75000
100000
125000
150000
175000
200000
Transaction Amount

e) Investigate whether certain features are more susceptible to fraud.

Based on the provided EDA, features showing potential susceptibility to fraud include:

- **Transaction Amount:** High transaction amounts appear to have a higher likelihood of being fraudulent, as seen in the distribution and box plots. Further analysis, perhaps using quantiles, could pinpoint specific thresholds.
- **Card Type, Merchant Category, and Location:** The countplots for these categorical features might reveal specific card types, merchant categories, or locations with disproportionately higher fraud rates. Analyzing the percentage of fraud within each category would be insightful.
- **Relationships between Numerical Features:** While the correlation matrix doesn't show strong linear relationships, the scatterplots of `Transaction_Amount` against other numerical features could reveal non-linear associations indicative of fraudulent patterns. For example, a specific range of `Cardholder_Age` combined with a certain `Transaction_Amount` might be a fraud indicator. Further investigation of these interactions is needed.
- **Cardholder_Monthly_Income and Credit_Limit:** The scatterplot of these features against each other shows some separation between fraudulent and non-fraudulent transactions, suggesting a possible link, though not a highly pronounced one. More detailed analysis is needed to determine the strength of this association.

#2) Data Preprocessing - Data Cleaning:

a) Handle missing values if any, using appropriate techniques such as KNNImputer; mean or median imputation for numerical features, and mode imputation for categorical features.

[ ]:
```
df.isna().sum()
```

[ ]:
```
Transaction_ID                0
Card_Type                    17
Merchant_Category            22
Transaction_Amount            6
Transaction_DateTime          0
Location                      0
Region                        0
Cardholder_Age              135
Cardholder_Gender            89
Cardholder_Monthly_Income   314
Cardholder_Average_Spend    208
Credit_Limit                  9
Device_Type                  40
Day_of_Week                   0
Is_Fraudulent                 0
dtype: int64
```

[ ]:
```
categorical_null_counts=df[categorical_cols].isnull().sum()
categorical_null_counts[categorical_null_counts > 0]
```

[ ]:
```
Card_Type            17
Merchant_Category    22
Cardholder_Gender    89
Device_Type          40
dtype: int64
```

[ ]:
```
for col in categorical_null_counts[categorical_null_counts > 0].index:
    print(f"{col}: \t {list(df[col].unique())}")
```

```
Card_Type:       ['Mastercard', 'American Express', 'Visa', 'RuPay', nan]
Merchant_Category:       ['Utility bill', 'Retail', 'Transportation', 'Online
Shopping', 'Entertainment', 'Education', 'Dining', 'Healthcare', nan]
Cardholder_Gender:       ['Female', 'Male', nan]
Device_Type:     ['Unknown', 'Desktop', 'Mobile', 'Point-of-Sale Terminal',
'Contactless Payment Device', nan]
```

[ ]:
```
for col in categorical_null_counts[categorical_null_counts > 0].index:
  df[col] = df[col].fillna(df[col].mode()[0]) # Mode Imputation for Categorical␣
↪Columns
```

[ ]:
```
df.isna().sum()
```

[ ]:
```
Transaction_ID                 0
Card_Type                      0
Merchant_Category              0
Transaction_Amount             6
Transaction_DateTime           0
Location                       0
Region                         0
Cardholder_Age               135
Cardholder_Gender              0
Cardholder_Monthly_Income    314
Cardholder_Average_Spend     208
Credit_Limit                   9
Device_Type                    0
Day_of_Week                    0
Is_Fraudulent                  0
dtype: int64
```

[ ]:
```
numerical_cols=df.select_dtypes(exclude='O').columns
df[numerical_cols].isna().sum()
```

[ ]:
```
Transaction_Amount             6
Cardholder_Age               135
Cardholder_Monthly_Income    314
Cardholder_Average_Spend     208
Credit_Limit                   9
```

```
dtype: int64
```

[ ]:
```
for col in numerical_cols:
    print(f"{col}: \t {list(df[col].unique())}")
```

```
Transaction_Amount:      [27214.0, 83956.0, 193280.0, 167381.0, 81170.0,
131918.0, 139036.0, 49967.0, 44528.0, 29587.0, 63687.0, 184612.0, 33611.0,
50601.0, 41551.0, 88069.0, 40066.0, 48136.0, 28879.0, 36238.0, 142896.0,
49726.0, 131311.0, 55740.0, 49647.0, 65469.0, 48618.0, 51205.0, 124937.0,
186440.0, 60608.0, 40458.0, 31352.0, 44347.0, 82174.0, 118066.0, 37988.0,
95314.0, 97354.0, 31917.0, 74869.0, 126505.0, 50568.0, 126038.0, 67500.0,
38794.0, 99500.0, 65273.0, 40444.0, 142798.0, 51085.0, 129968.0, 69099.0,
40523.0, 34088.0, 112071.0, 50784.0, 84896.0, 81979.0, 94180.0, 77445.0,
34939.0, 95793.0, 78848.0, 87771.0, 87818.0, 50464.0, 50939.0, 83039.0, 34309.0,
75151.0, 29234.0, 98244.0, 30458.0, 42119.0, 49489.0, 47169.0, 115450.0,
89186.0, 31385.0, 52328.0, 88623.0, 49174.0, 68124.0, 101974.0, 28542.0,
44608.0, 46354.0, 34984.0, 49166.0, 109614.0, 190070.0, 164471.0, 107121.0,
63147.0, 26107.0, 36419.0, 27283.0, 34326.0, 96392.0, 42374.0, 31822.0,
197999.0, 86357.0, 37410.0, 33652.0, 104854.0, 32382.0, 90035.0, 29627.0,
53205.0, 133500.0, 111328.0, 128065.0, 33933.0, 169178.0, 46113.0, 141006.0,
102668.0, 149403.0, 73122.0, 36783.0, 64339.0, 149984.0, 192292.0, 63665.0,
42894.0, 50534.0, 194704.0, 44546.0, 36453.0, 43511.0, 89824.0, 143177.0,
27800.0, 26233.0, 97567.0, 49860.0, 88620.0, 43105.0, 28824.0, 55568.0,
182562.0, 36358.0, 40638.0, 42181.0, 29986.0, 56516.0, 143756.0, 56578.0,
33539.0, 37176.0, 136335.0, 158294.0, 34011.0, 175673.0, 105317.0, 47262.0,
34440.0, 143634.0, 40640.0, 85675.0, 50525.0, 93150.0, 32087.0, 53675.0,
141752.0, 34644.0, 40097.0, 78445.0, 89631.0, 63746.0, 47089.0, 144277.0,
94344.0, 31516.0, 197029.0, 59675.0, 134388.0, 55995.0, 146296.0, 33299.0,
145209.0, 27242.0, 42215.0, 42734.0, 173010.0, 49435.0, 35485.0, 61836.0,
90604.0, 118907.0, 137341.0, 36632.0, 91881.0, 85692.0, 62985.0, 104430.0,
30701.0, 41636.0, 130162.0, 28444.0, 77772.0, 108464.0, 32548.0, 111602.0,
45534.0, 40459.0, 141732.0, 39028.0, 196817.0, 106099.0, 133777.0, 47975.0,
38704.0, 28726.0, 39301.0, 32774.0, 48107.0, 96895.0, 74340.0, 136043.0,
40450.0, 111008.0, 32896.0, 70704.0, 47868.0, 66304.0, 45780.0, 47159.0,
41968.0, 44177.0, 28151.0, 64387.0, 89237.0, 42319.0, 37399.0, 67344.0, 49132.0,
37309.0, 190834.0, 61519.0, 47950.0, 33670.0, 97623.0, 96979.0, 37910.0,
48237.0, 41282.0, 136757.0, 42977.0, 84136.0, 125909.0, 59716.0, 137357.0,
41600.0, 152896.0, 68158.0, 31655.0, 175266.0, 112794.0, 47257.0, 99607.0,
37377.0, 27609.0, 48984.0, 97754.0, 27320.0, 35130.0, 174155.0, 107504.0,
71553.0, 133304.0, 199923.0, 33661.0, 136770.0, 108794.0, 90030.0, 168099.0,
26892.0, 74431.0, 55544.0, 80126.0, 46883.0, 120377.0, 26550.0, 138362.0,
79957.0, 101878.0, 117971.0, 43038.0, 197443.0, 58777.0, 98635.0, 46972.0,
114572.0, 32432.0, 56701.0, 59171.0, 88447.0, 67614.0, 38699.0, 31679.0,
32025.0, 27566.0, 32921.0, 124054.0, 30276.0, 77318.0, 71265.0, 66763.0,
27032.0, 44029.0, 37295.0, 87805.0, 49660.0, 28832.0, 35834.0, 43717.0,
134247.0, 34322.0, 33956.0, 39190.0, 132323.0, 43972.0, 27261.0, 30586.0,
44164.0, 77607.0, 91123.0, 37304.0, 198614.0, 58012.0, 40845.0, 27766.0,
```

36353.0, 46258.0, 75711.0, 100280.0, 100164.0, 56958.0, 30972.0, 166234.0,
157605.0, 48277.0, 30645.0, 36498.0, 176014.0, 36809.0, 26806.0, 97778.0,
107624.0, 29887.0, 47419.0, 83141.0, 44187.0, 72591.0, 70558.0, 69014.0,
171407.0, 45176.0, 32485.0, 39677.0, 121128.0, 41040.0, 34808.0, 115228.0,
29632.0, 100952.0, 137619.0, 37384.0, 45702.0, 47923.0, 87293.0, 53013.0,
197075.0, 31609.0, 34085.0, 59403.0, 39563.0, 25205.0, 143818.0, 193278.0,
77684.0, 44974.0, 80830.0, 46773.0, 63250.0, 37693.0, 43228.0, 98438.0,
134945.0, 38700.0, 53025.0, 40560.0, 26282.0, 181845.0, 45881.0, 48208.0,
75525.0, 61674.0, 60749.0, 183957.0, 63152.0, 45704.0, 104552.0, 147403.0,
27521.0, 64724.0, 40802.0, 73597.0, 95472.0, 45647.0, 125844.0, 38894.0,
122409.0, 29973.0, 86639.0, 61613.0, 35968.0, 108026.0, 131339.0, 28513.0,
42221.0, 118848.0, 49127.0, 133123.0, 147280.0, 28088.0, 184282.0, 77693.0,
46313.0, 42921.0, 40089.0, 86049.0, 46677.0, 108394.0, 108417.0, 193508.0,
29409.0, 39280.0, 93001.0, 34178.0, 83263.0, 32190.0, 48599.0, 68336.0,
152571.0, 103037.0, 33143.0, 44580.0, 30855.0, 89660.0, 56741.0, 27281.0,
145138.0, 79918.0, 52588.0, 43869.0, 27720.0, 96889.0, 25143.0, 91151.0,
112469.0, 75261.0, 25941.0, 138372.0, 167286.0, 113553.0, 156765.0, 46053.0,
81364.0, 99442.0, 33488.0, 34509.0, 133439.0, 144148.0, 73245.0, 118531.0,
37134.0, 72367.0, 39260.0, 42157.0, 46577.0, 133058.0, 70227.0, 41982.0,
79457.0, 69390.0, 26808.0, 88294.0, 101272.0, 52281.0, 120814.0, 36611.0,
85663.0, 33612.0, 72800.0, 108894.0, 27586.0, 35638.0, 113367.0, 187760.0,
68374.0, 25019.0, 87513.0, 84220.0, 90641.0, 55054.0, 62043.0, 121132.0,
48331.0, 49561.0, 86401.0, 165905.0, 46824.0, 59905.0, 69470.0, 94290.0,
97964.0, 77268.0, 95580.0, 31539.0, 96040.0, 59973.0, 159393.0, 138384.0,
73208.0, 85646.0, 61080.0, 186333.0, 103616.0, 28403.0, 47905.0, 156074.0,
153081.0, 178048.0, 80775.0, 109192.0, 81763.0, 35260.0, 121726.0, 94318.0,
34959.0, 181153.0, 90891.0, 105748.0, 66833.0, 50425.0, 33691.0, 74584.0,
137133.0, 48705.0, 49082.0, 35534.0, 26290.0, 93344.0, 31644.0, 114849.0,
158485.0, 119747.0, 74229.0, 26832.0, 25617.0, 51515.0, 39056.0, 39705.0,
84489.0, 27599.0, 97902.0, 46037.0, 48990.0, 113209.0, 87058.0, 143206.0,
48915.0, 54178.0, 56921.0, 155942.0, 47549.0, 31638.0, 182161.0, 57022.0,
112515.0, 199273.0, 47007.0, 76567.0, 80869.0, 36127.0, 37977.0, 69932.0,
84496.0, 29239.0, 117072.0, 72606.0, 25153.0, 82255.0, 96092.0, 32444.0,
37836.0, 111422.0, 46170.0, 26718.0, 35112.0, 139462.0, 91896.0, 71270.0,
42558.0, 90536.0, 109482.0, 27696.0, 28260.0, 178816.0, 91865.0, 35005.0,
152434.0, 37996.0, 130996.0, 32610.0, 45411.0, 80021.0, 33915.0, 136496.0,
48737.0, 39416.0, 48710.0, 34006.0, 58461.0, 58132.0, 110847.0, 68831.0,
88143.0, 59579.0, 61943.0, 48435.0, 77063.0, 66542.0, 163311.0, 31037.0,
45046.0, 27361.0, 66732.0, 71652.0, 147243.0, 102538.0, 71175.0, 47075.0,
171011.0, 64365.0, 97752.0, 30039.0, 78763.0, 53429.0, 28049.0, 35419.0,
106506.0, 95474.0, 40430.0, 71804.0, 44774.0, 29231.0, 42658.0, 46881.0,
115217.0, 29807.0, 128569.0, 76860.0, 110478.0, 38217.0, 86486.0, 26893.0,
49133.0, 25207.0, 94574.0, 59503.0, 42173.0, 41348.0, 98892.0, 56518.0, 83150.0,
116710.0, 51235.0, 44860.0, 75583.0, 91696.0, 127305.0, 27502.0, 45504.0,
125023.0, 40733.0, 120608.0, 99539.0, 25064.0, 70678.0, 28466.0, 105469.0,
48386.0, 26839.0, 109054.0, 49517.0, 72517.0, 43384.0, 135979.0, 111785.0,
71927.0, 55456.0, 51141.0, 96101.0, 27984.0, 42791.0, 152600.0, 49191.0,
138408.0, 41997.0, 91045.0, 109059.0, 176522.0, 66946.0, 90415.0, 38840.0,

114357.0, 29870.0, 95601.0, 99266.0, 31439.0, 76150.0, 26995.0, 36416.0,
56126.0, 48481.0, 41903.0, 156877.0, 87823.0, 33953.0, 42959.0, 130716.0,
73505.0, 81243.0, 26530.0, 71408.0, 44861.0, 166078.0, 96652.0, 57380.0,
93269.0, 51859.0, 32353.0, 44751.0, 38760.0, 31447.0, 63604.0, 29693.0, 92216.0,
42705.0, 77832.0, 60719.0, 44830.0, 96094.0, 52414.0, 30084.0, 34413.0, 32093.0,
80971.0, 58826.0, 42228.0, 69874.0, 97796.0, 86135.0, 29720.0, 50059.0, 44368.0,
82655.0, 45840.0, 181009.0, 76414.0, 55620.0, 53979.0, 74684.0, 32483.0,
42940.0, 81094.0, 29537.0, 44542.0, 85207.0, 35613.0, 39659.0, 39444.0, 96873.0,
29791.0, 161335.0, 56139.0, 37501.0, 189238.0, 29353.0, 150563.0, 72346.0,
42786.0, 99953.0, 30973.0, 25654.0, 148938.0, 25605.0, 123575.0, 88477.0,
37853.0, 43557.0, 37227.0, 138585.0, 29436.0, 142270.0, 63931.0, 87806.0,
36151.0, 94498.0, 100755.0, 32426.0, 89658.0, 42456.0, 102095.0, 45328.0,
42855.0, 192469.0, 48081.0, 165079.0, 85126.0, 188499.0, 194332.0, 190751.0,
165909.0, 53639.0, 57924.0, 67238.0, 49426.0, 155868.0, 38246.0, 60539.0,
159273.0, 25878.0, 54011.0, 179596.0, 53365.0, 79034.0, 43156.0, 63102.0,
80059.0, 53391.0, 78976.0, 92076.0, 93116.0, 66988.0, 110331.0, 53164.0,
52569.0, 104478.0, 90572.0, 27124.0, 34368.0, 58785.0, 56781.0, 42674.0,
37003.0, 46398.0, 114025.0, 170891.0, 51920.0, 144647.0, 116881.0, 44492.0,
32631.0, 89820.0, 72153.0, 41279.0, 103519.0, 43142.0, 93696.0, 29792.0,
32159.0, 128604.0, 35237.0, 64454.0, 54607.0, 34868.0, 87775.0, 127182.0,
42198.0, 129182.0, 30220.0, 197304.0, 44163.0, 137695.0, 56912.0, 51289.0,
26515.0, 36164.0, 87396.0, 68760.0, 134575.0, 34980.0, 43584.0, 35372.0,
84587.0, 41140.0, 29018.0, 37578.0, 34395.0, 38951.0, 33848.0, 43990.0,
127697.0, 67843.0, 91861.0, 54756.0, 41660.0, 89903.0, 49320.0, 37058.0,
39324.0, 34651.0, 27994.0, 49101.0, 31960.0, 25258.0, 34190.0, 27669.0, 82677.0,
46876.0, 48031.0, 50556.0, 41003.0, 51341.0, 135215.0, 27471.0, 83656.0,
114383.0, 25929.0, 35745.0, 165729.0, 32354.0, 119881.0, 126388.0, 26646.0,
54581.0, 33328.0, 119406.0, 117534.0, 43271.0, 44093.0, 86810.0, 94326.0,
89308.0, 35426.0, 43706.0, 87680.0, 195606.0, 35264.0, 103587.0, 42898.0,
37644.0, 78165.0, 33368.0, 47405.0, 27014.0, 49464.0, 107870.0, 25561.0,
30618.0, 161361.0, 58983.0, 163589.0, 197027.0, 63365.0, 95818.0, 41734.0,
108254.0, 35087.0, 122398.0, 28849.0, 107460.0, 83446.0, 54677.0, 45455.0,
99229.0, 61345.0, 35091.0, 43447.0, 107158.0, 76575.0, 75226.0, 81360.0,
51809.0, 128235.0, 36226.0, 36755.0, 134323.0, 27659.0, 67680.0, 173537.0,
31196.0, 101960.0, 54287.0, 60915.0, 48131.0, 70598.0, 166624.0, 48276.0,
41257.0, 45885.0, 117167.0, 92390.0, 90450.0, 41066.0, 141003.0, 83385.0,
41034.0, 58208.0, 127632.0, 91540.0, 65476.0, 39592.0, 120093.0, 156557.0,
112937.0, 43484.0, 123725.0, 43669.0, 87233.0, 36715.0, 139412.0, 26376.0,
78346.0, 170322.0, 76030.0, 80460.0, 32534.0, 158883.0, 80673.0, 81263.0,
91171.0, 119516.0, 30178.0, 124987.0, 59873.0, 39698.0, 66815.0, 37699.0,
110178.0, 90627.0, 38440.0, 90323.0, 35172.0, 94083.0, 45538.0, 61562.0,
43748.0, 73171.0, 35907.0, 88212.0, 186046.0, 61108.0, 33526.0, 47129.0,
112329.0, 83542.0, 43161.0, 35144.0, 113164.0, 42988.0, 52378.0, 74874.0,
129387.0, 132683.0, 37670.0, 84389.0, 47800.0, 31810.0, 69488.0, 60374.0,
47601.0, 120084.0, 34677.0, 48230.0, 122799.0, 34610.0, 49146.0, 81986.0,
44715.0, 87759.0, 67546.0, 34726.0, 94131.0, 105691.0, 112846.0, 84319.0,
92889.0, 65562.0, 38269.0, 45798.0, 69189.0, 85962.0, 139454.0, 142016.0,
30000.0, 87423.0, 48913.0, 83630.0, 86753.0, 33645.0, 43569.0, 61668.0,

135551.0, 43976.0, 30317.0, 71647.0, 43527.0, 121624.0, 53900.0, 58159.0,
46565.0, 80902.0, 74483.0, 51649.0, 41135.0, 39645.0, 26954.0, 71363.0, 38223.0,
63100.0, 34703.0, 53522.0, 98334.0, 38444.0, 132900.0, 132697.0, 38984.0,
43583.0, 66721.0, 53230.0, 142512.0, 95467.0, 70360.0, 169909.0, 54486.0,
88168.0, 61941.0, 71567.0, 96301.0, 27818.0, 44717.0, 90907.0, 60230.0, 39429.0,
34404.0, 85161.0, 98919.0, 57003.0, 94662.0, 40082.0, 61212.0, 34643.0, 37742.0,
118988.0, 75539.0, 143146.0, 70689.0, 146211.0, 183761.0, 88964.0, 67314.0,
60537.0, 98306.0, 71193.0, 144913.0, 32084.0, 81911.0, 162521.0, 76845.0,
40995.0, 137964.0, 57839.0, 48885.0, 122042.0, 98294.0, 41006.0, 50901.0,
25291.0, 128170.0, 81967.0, 140053.0, 82036.0, 104229.0, 111569.0, 26332.0,
59125.0, 99877.0, 46694.0, 132954.0, 97572.0, 178230.0, 98301.0, 43306.0,
82654.0, 80919.0, 164728.0, 56881.0, 31487.0, 39427.0, 27660.0, 132332.0,
76055.0, 44733.0, 91195.0, 99387.0, 108253.0, 40770.0, 91550.0, 54390.0,
89047.0, 190836.0, 31749.0, 43047.0, 28870.0, 41476.0, 71801.0, 56135.0,
29270.0, 30212.0, 58399.0, 53448.0, 30901.0, 26746.0, 94962.0, 86518.0, 42025.0,
50368.0, 59017.0, 33849.0, 29600.0, 29814.0, 137319.0, 52881.0, 36220.0,
78517.0, 32750.0, 30416.0, 31721.0, 29836.0, 41738.0, 47380.0, 122029.0,
57893.0, 70567.0, 48486.0, 87442.0, 54913.0, 40481.0, 39433.0, 150524.0,
41927.0, 44343.0, 42862.0, 42099.0, 66041.0, 39901.0, 32088.0, 28139.0, 27304.0,
40656.0, 106244.0, 63639.0, 25840.0, 38669.0, 45968.0, 193048.0, 49524.0,
54698.0, 49284.0, 34353.0, 44574.0, 73623.0, 121794.0, 193361.0, 155387.0,
118659.0, 70812.0, 38635.0, 165842.0, 88082.0, 101572.0, 44633.0, 186787.0,
77428.0, 140433.0, 75374.0, 60524.0, 101682.0, 35582.0, 75705.0, nan, 31442.0,
131213.0, 45850.0, 101957.0, 74987.0, 45530.0, 47461.0, 74531.0, 34107.0,
86158.0, 118435.0, 134837.0, 97024.0, 86895.0, 52306.0, 46330.0, 48177.0,
63233.0, 74588.0, 35347.0, 67721.0, 42918.0, 142236.0, 30755.0, 36051.0,
34522.0, 29934.0, 66430.0, 54739.0, 38878.0, 45028.0, 179736.0, 116714.0,
84475.0, 105527.0, 106181.0, 54738.0, 34243.0, 119081.0, 145357.0, 131308.0,
144490.0, 67383.0, 74966.0, 41494.0, 31457.0, 39208.0, 60207.0, 40637.0,
68327.0, 35391.0, 95246.0, 41226.0, 92799.0, 197378.0, 32342.0, 37643.0,
38427.0, 30505.0, 69785.0, 52470.0, 48411.0, 99541.0, 57545.0, 75697.0, 31042.0,
92053.0, 57543.0, 149145.0, 86833.0, 49462.0, 146924.0, 46784.0, 42310.0,
74402.0, 39582.0, 112181.0, 72304.0, 125290.0, 80797.0, 32597.0, 52094.0,
47919.0, 90124.0, 79796.0, 32705.0, 143843.0, 129292.0, 77971.0, 25036.0,
44095.0, 45917.0, 83928.0, 25419.0, 30978.0, 170556.0, 38234.0, 96188.0,
83984.0, 157869.0, 135324.0, 54684.0, 128339.0, 99514.0, 25765.0, 30698.0,
49755.0, 33843.0, 97337.0, 30153.0, 55783.0, 98343.0, 110349.0, 29137.0,
30607.0, 131446.0, 112438.0, 73241.0, 97911.0, 26493.0, 78408.0, 73222.0,
90738.0, 37014.0, 55682.0, 131327.0, 37660.0, 145306.0, 165058.0, 29071.0,
118523.0, 75281.0, 87976.0, 70196.0, 36564.0, 96116.0, 30722.0, 33311.0,
59204.0, 42636.0, 45317.0, 114191.0, 117228.0, 113388.0, 25855.0, 45396.0,
74153.0, 27589.0, 25594.0, 94768.0, 106714.0, 38225.0, 27978.0, 84977.0,
27403.0, 70375.0, 64995.0, 36657.0, 42104.0, 78950.0, 57823.0, 55916.0,
179299.0, 54873.0, 139238.0, 45047.0, 47282.0, 67563.0, 41829.0, 135224.0,
68147.0, 86456.0, 176908.0, 39763.0, 41581.0, 102934.0, 32126.0, 167480.0,
61671.0, 86580.0, 43226.0, 39904.0, 74777.0, 32101.0, 72369.0, 47928.0, 28451.0,
165251.0, 49714.0, 69036.0, 38429.0, 64974.0, 37715.0, 102764.0, 68952.0,
54152.0, 71922.0, 155661.0, 75837.0, 33764.0, 45080.0, 120989.0, 47395.0,

118544.0, 123340.0, 71622.0, 79470.0, 65574.0, 106453.0, 32288.0, 183785.0,
190629.0, 153191.0, 41819.0, 45420.0, 73566.0, 25771.0, 50733.0, 58298.0,
88458.0, 35018.0, 138849.0, 45281.0, 28018.0, 191265.0, 27100.0, 25050.0,
39491.0, 47940.0, 49379.0, 69143.0, 98490.0, 26494.0, 50336.0, 35717.0, 85392.0,
69497.0, 135997.0, 123494.0, 45577.0, 26355.0, 32442.0, 137238.0, 43044.0,
146937.0, 46705.0, 66603.0, 86445.0, 90546.0, 91670.0, 158486.0, 148538.0,
155860.0, 28468.0, 77243.0, 34654.0, 93097.0, 97974.0, 167553.0, 97991.0,
100453.0, 25334.0, 149609.0, 32721.0, 36231.0, 36233.0, 55624.0, 30956.0,
34336.0, 68861.0, 198184.0, 42423.0, 88416.0, 25129.0, 188153.0, 132112.0,
77828.0, 30583.0, 84289.0, 32632.0, 27977.0, 186771.0, 113094.0, 59084.0,
147625.0, 109424.0, 26293.0, 114284.0, 31254.0, 33685.0, 37999.0, 66196.0,
35266.0, 95499.0, 75012.0, 36324.0, 61469.0, 117244.0, 35097.0, 50727.0,
42676.0, 41146.0, 144925.0, 43957.0, 44194.0, 38672.0, 32211.0, 68705.0,
33766.0, 44054.0, 45708.0, 41651.0, 43953.0, 137109.0, 37342.0, 35381.0,
25711.0, 105667.0, 48163.0, 35707.0, 35675.0, 133306.0, 34141.0, 88616.0,
104887.0, 94683.0, 42332.0, 94998.0, 194182.0, 125338.0, 81378.0, 127747.0,
39911.0, 117040.0, 142026.0, 181177.0, 150114.0, 97307.0, 97516.0, 86282.0,
130899.0, 82987.0, 45119.0, 115365.0, 32755.0, 148031.0, 26553.0, 84189.0,
61397.0, 26658.0, 123707.0, 37930.0, 60886.0, 64986.0, 78303.0, 188495.0,
84694.0, 46672.0, 40034.0, 36739.0, 28859.0, 99227.0, 48624.0, 29993.0, 98366.0,
45982.0, 160203.0, 27153.0, 145801.0, 65527.0, 85946.0, 69072.0, 27738.0,
64820.0, 84937.0, 49512.0, 38172.0, 163769.0, 36337.0, 107214.0, 28447.0,
134988.0, 32996.0, 49125.0, 61845.0, 25947.0, 32184.0, 43803.0, 46327.0,
137932.0, 28991.0, 118740.0, 54157.0, 161645.0, 47243.0, 151473.0, 40427.0,
172107.0, 56461.0, 188857.0, 62632.0, 100403.0, 112959.0, 84081.0, 60313.0,
108446.0, 48485.0, 30192.0, 60899.0, 98396.0, 39747.0, 47233.0, 137696.0,
84755.0, 85436.0, 76742.0, 44576.0, 142897.0, 38830.0, 100974.0, 44398.0,
34491.0, 76039.0, 38338.0, 122218.0, 113176.0, 112862.0, 37281.0, 106389.0,
29355.0, 123999.0, 127078.0, 85245.0, 97692.0, 139897.0, 77079.0, 103718.0,
31243.0, 31806.0, 45177.0, 44956.0, 27122.0, 51651.0, 96296.0, 25053.0,
119986.0, 97306.0, 32707.0, 59693.0, 58832.0, 28017.0, 41117.0, 114523.0,
184951.0, 63809.0, 59336.0, 69561.0, 28881.0, 89811.0, 42910.0, 46016.0,
147537.0, 87548.0, 59964.0, 44719.0, 46038.0, 27926.0, 189135.0, 113074.0,
43065.0, 69281.0, 42467.0, 73556.0, 116782.0, 97110.0, 28950.0, 42769.0,
46078.0, 113624.0, 64205.0, 42261.0, 129004.0, 49279.0, 117016.0, 107085.0,
26398.0, 61276.0, 93163.0, 37083.0, 143498.0, 48070.0, 123708.0, 91034.0,
26324.0, 149888.0, 68027.0, 54381.0, 71205.0, 123086.0, 48630.0, 139793.0,
119479.0, 46531.0, 40009.0, 36355.0, 34576.0, 27461.0, 82520.0, 34569.0,
112052.0, 41673.0, 195881.0, 65416.0, 142449.0, 114621.0, 196464.0, 79758.0,
81492.0, 45674.0, 28945.0, 113294.0, 33234.0, 34919.0, 52007.0, 109369.0,
42626.0, 41676.0, 159396.0, 58270.0, 156439.0, 51999.0, 82761.0, 96827.0,
35914.0, 72259.0, 33999.0, 94400.0, 94659.0, 92067.0, 83700.0, 47612.0, 82965.0,
29782.0, 132524.0, 95160.0, 140192.0, 105692.0, 68884.0, 60531.0, 178738.0,
29858.0, 116607.0, 49871.0, 35200.0, 37752.0, 43319.0, 37324.0, 30636.0,
131602.0, 47152.0, 68382.0, 138202.0, 83453.0, 33637.0, 45601.0, 121765.0,
111391.0, 94093.0, 42884.0, 170058.0, 137633.0, 56501.0, 42512.0, 73582.0,
49949.0, 31470.0, 38342.0, 38919.0, 61806.0, 78176.0, 43280.0, 42527.0, 43936.0,
32633.0, 115221.0, 117578.0, 138313.0, 33727.0, 96872.0, 62405.0, 62343.0,

49905.0, 102393.0, 82014.0, 68791.0, 86311.0, 72556.0, 38841.0, 76604.0,
62499.0, 98741.0, 25529.0, 41614.0, 132277.0, 25204.0, 33837.0, 69158.0,
90461.0, 181120.0, 38808.0, 43409.0, 165367.0, 37675.0, 136875.0, 74250.0,
41491.0, 34849.0, 95270.0, 184292.0, 38646.0, 31865.0, 42851.0, 118733.0,
156183.0, 41370.0, 92546.0, 49236.0, 45350.0, 43722.0, 76761.0, 102686.0,
82632.0, 39226.0, 67320.0, 83451.0, 78568.0, 25995.0, 95822.0, 27940.0, 26891.0,
59118.0, 25562.0, 52535.0, 30606.0, 136654.0, 87502.0, 48949.0, 136902.0,
94474.0, 181384.0, 100604.0, 70241.0, 45511.0, 192829.0, 85665.0, 27426.0,
76238.0, 30917.0, 61537.0, 45539.0, 172271.0, 51756.0, 28567.0, 25900.0,
79422.0, 49690.0, 34047.0, 39439.0, 91770.0, 59037.0, 58872.0, 27653.0, 99329.0,
123375.0, 77739.0, 51082.0, 54709.0, 31696.0, 31458.0, 125962.0, 95027.0,
66057.0, 26581.0, 34400.0, 60205.0, 25543.0, 106156.0, 123163.0, 59173.0,
187033.0, 30575.0, 33013.0, 91537.0, 65428.0, 42483.0, 48199.0, 40964.0,
45204.0, 42067.0, 31256.0, 90772.0, 43167.0, 46164.0, 63235.0, 55915.0,
122447.0, 97868.0, 184992.0, 162858.0, 37612.0, 102400.0, 37093.0, 199043.0,
118095.0, 199090.0, 30423.0, 50185.0, 29412.0, 76887.0, 184457.0, 40088.0,
48161.0, 78675.0, 49693.0, 71900.0, 115067.0, 42506.0, 44621.0, 37920.0,
112189.0, 28515.0, 139673.0, 94790.0, 51928.0, 29711.0, 44481.0, 54212.0,
67244.0, 90346.0, 32959.0, 141737.0, 47173.0, 35796.0, 122556.0, 33495.0,
102733.0, 43431.0, 86262.0, 25571.0, 61069.0, 91653.0, 45246.0, 170130.0,
54865.0, 198998.0, 60854.0, 89874.0, 68436.0, 134806.0, 55487.0, 25721.0,
68393.0, 44710.0, 127302.0, 124884.0, 34068.0, 35842.0, 30258.0, 67765.0,
99243.0, 35411.0, 38394.0, 35794.0, 137082.0, 67318.0, 56361.0, 39756.0,
38851.0, 40436.0, 36732.0, 196065.0, 45707.0, 52133.0, 149401.0, 87424.0,
31986.0, 27463.0, 25913.0, 46880.0, 64767.0, 135374.0, 69721.0, 114695.0,
69142.0, 147540.0, 60160.0, 130703.0, 53141.0, 162552.0, 119697.0, 64442.0,
56852.0, 66126.0, 49544.0, 35808.0, 56598.0, 84030.0, 49346.0, 109101.0,
93514.0, 34477.0, 133368.0, 35744.0, 48052.0, 191003.0, 111687.0, 135507.0,
33290.0, 25467.0, 108807.0, 30339.0, 117564.0, 35362.0, 47314.0, 84888.0,
45829.0, 58427.0, 46021.0, 104421.0, 29581.0, 108114.0, 45456.0, 32139.0,
32039.0, 49587.0, 47111.0, 82199.0, 32361.0, 51328.0, 25148.0, 65883.0, 56629.0,
34425.0, 34625.0, 50364.0, 44816.0, 40604.0, 145567.0, 57668.0, 31586.0,
36620.0, 76258.0, 47301.0, 74199.0, 40078.0, 102528.0, 75411.0, 178450.0,
182720.0, 172654.0, 52428.0, 86455.0, 63291.0, 70500.0, 43085.0, 84321.0,
81291.0, 68888.0, 185977.0, 107970.0, 109095.0, 189077.0, 37359.0, 99554.0,
59028.0, 25480.0, 115073.0, 40789.0, 43207.0, 49712.0, 65253.0, 29571.0,
80390.0, 46116.0, 27433.0, 113905.0, 25635.0, 121265.0, 99137.0, 28177.0,
139579.0, 175780.0, 53451.0, 31760.0, 140220.0, 136277.0, 47752.0, 82423.0,
57355.0, 44882.0, 30077.0, 32452.0, 124022.0, 28193.0, 48671.0, 136590.0,
60059.0, 42072.0, 42745.0, 70285.0, 36523.0, 65684.0, 136852.0, 131958.0,
174854.0, 152710.0, 25699.0, 47249.0, 48284.0, 66555.0, 25787.0, 61817.0,
90898.0, 80730.0, 38007.0, 32675.0, 41677.0, 31838.0, 28770.0, 74887.0,
125760.0, 69586.0, 180387.0, 58411.0, 39546.0, 80965.0, 89597.0, 155399.0,
96420.0, 105831.0, 83028.0, 81092.0, 41826.0, 138103.0, 124332.0, 110360.0,
46925.0, 110666.0, 59337.0, 127643.0, 125689.0, 41092.0, 44216.0, 43163.0,
49686.0, 89373.0, 91092.0, 60242.0, 72355.0, 148307.0, 33560.0, 78740.0,
36953.0, 46310.0, 158251.0, 60169.0, 44037.0, 25083.0, 49744.0, 136269.0,
129932.0, 93422.0, 25554.0, 39719.0, 82746.0, 58922.0, 38276.0, 70275.0,

136435.0, 93196.0, 35471.0, 70536.0, 39741.0, 28377.0, 128577.0, 80371.0,
33080.0, 88507.0, 27763.0, 35606.0, 80337.0, 49271.0, 109419.0, 47939.0,
41860.0, 27775.0, 117969.0, 39204.0, 40251.0, 71989.0, 77995.0, 52132.0,
27519.0, 68377.0, 37818.0, 95585.0, 49014.0, 27774.0, 102045.0, 95310.0,
158021.0, 31023.0, 36248.0, 95739.0, 30302.0, 32775.0, 70254.0, 35145.0,
35559.0, 140259.0, 138417.0, 82616.0, 108182.0, 44775.0, 149713.0, 28758.0,
56017.0, 47258.0, 101266.0, 27900.0, 32281.0, 188834.0, 146658.0, 39972.0,
103754.0, 42207.0, 94865.0, 99090.0, 70579.0, 74033.0, 45598.0, 41589.0,
37261.0, 36060.0, 86177.0, 90657.0, 44166.0, 35536.0, 33822.0, 186501.0,
100069.0, 148100.0, 168162.0, 37438.0, 37811.0, 60282.0, 83576.0, 35100.0,
149983.0, 39294.0, 45349.0, 78212.0, 64224.0, 135996.0, 76807.0, 181796.0,
38266.0, 42950.0, 48527.0, 57743.0, 101759.0, 35278.0, 43900.0, 26935.0,
40490.0, 46405.0, 49568.0, 167585.0, 28582.0, 169407.0, 44895.0, 160470.0,
97889.0, 42945.0, 71378.0, 39422.0, 83051.0, 47474.0, 26843.0, 122275.0,
101407.0, 120736.0, 84354.0, 30580.0, 46112.0, 32502.0, 52278.0, 63211.0,
67923.0, 44654.0, 175851.0, 140877.0, 40020.0, 102230.0, 41752.0, 140042.0,
37953.0, 27632.0, 70596.0, 33201.0, 25174.0, 25107.0, 42097.0, 42878.0, 87047.0,
78883.0, 98861.0, 58958.0, 42507.0, 26119.0, 42010.0, 42084.0, 120363.0,
41811.0, 72427.0, 36849.0, 158053.0, 66472.0, 115272.0, 45058.0, 45843.0,
91727.0, 99495.0, 81733.0, 93107.0, 49437.0, 40443.0, 29242.0, 49019.0,
113038.0, 95880.0, 44556.0, 38876.0, 81628.0, 33505.0, 33190.0, 61979.0,
54986.0, 119542.0, 168954.0, 85014.0, 87790.0, 29747.0, 70167.0, 126936.0,
40605.0, 37311.0, 53976.0, 141377.0, 41398.0, 140458.0, 80486.0, 190838.0,
43757.0, 102411.0, 30815.0, 48863.0, 47337.0, 27030.0, 44267.0, 27878.0,
66954.0, 74036.0, 145897.0, 95332.0, 73268.0, 49442.0, 30243.0, 77282.0,
82210.0, 93919.0, 97130.0, 135250.0, 32130.0, 45582.0, 39476.0, 41198.0,
87584.0, 117565.0, 115016.0, 115639.0, 84750.0, 38777.0, 76961.0, 96028.0,
40682.0, 26475.0, 198269.0, 103946.0, 39600.0, 71007.0, 93793.0, 57161.0,
45619.0, 32937.0, 47877.0, 37327.0, 125785.0, 33920.0, 74649.0, 144744.0,
49504.0, 143307.0, 25976.0, 128716.0, 88135.0, 90078.0, 37792.0, 148316.0,
131956.0, 49808.0, 43458.0, 90696.0, 95744.0, 83896.0, 94014.0, 42175.0,
121856.0, 36308.0, 184385.0, 92282.0, 89442.0, 144229.0, 100481.0, 197330.0,
144377.0, 45719.0, 112844.0, 107850.0, 29086.0, 143926.0, 38475.0, 87594.0,
94535.0, 49998.0, 26750.0, 82602.0, 39037.0, 137716.0, 32661.0, 75548.0,
86852.0, 89618.0, 75942.0, 78932.0, 49142.0, 133271.0, 152938.0, 85514.0,
127554.0, 36184.0, 26087.0, 49870.0, 91937.0, 42338.0, 161347.0, 84461.0,
46119.0, 48184.0, 42580.0, 93056.0, 49786.0, 39287.0, 26473.0, 71827.0, 29226.0,
146445.0, 37663.0, 60523.0, 27921.0, 25538.0, 74465.0, 84633.0, 91453.0,
61549.0, 111234.0, 198239.0, 26393.0, 50393.0, 35060.0, 28044.0, 54908.0,
65920.0, 27092.0, 43703.0, 70619.0, 25603.0, 37705.0, 26578.0, 58332.0, 37985.0,
98711.0, 34699.0, 36431.0, 39212.0, 71344.0, 63921.0, 70950.0, 43913.0, 40674.0,
49837.0, 52603.0, 182319.0, 129621.0, 48665.0, 147907.0, 39610.0, 97762.0,
145972.0, 85776.0, 34949.0, 58536.0, 67191.0, 43891.0, 155613.0, 25580.0,
45842.0, 34877.0, 63037.0, 37196.0, 49398.0, 46236.0, 77930.0, 104756.0,
37202.0, 149182.0, 59608.0, 46983.0, 190821.0, 27385.0, 57442.0, 36679.0,
43998.0, 93070.0, 100529.0, 68904.0, 65675.0, 45897.0, 81955.0, 36865.0,
39978.0, 50314.0, 161025.0, 40669.0, 34280.0, 123440.0, 89456.0, 90711.0,
70217.0, 40855.0, 89005.0, 39503.0, 177889.0, 47383.0, 66606.0, 43260.0,

37926.0, 76317.0, 36235.0, 42985.0, 48914.0, 31030.0, 30594.0, 94676.0,
148293.0, 72971.0, 163235.0, 26724.0, 143094.0, 47943.0, 65647.0, 178618.0,
26296.0, 32447.0, 61820.0, 28373.0, 130881.0, 130693.0, 62903.0, 33597.0,
37468.0, 62333.0, 95437.0, 57535.0, 187243.0, 166486.0, 81138.0, 44523.0,
128324.0, 26720.0, 41517.0, 30487.0, 39959.0, 31155.0, 147099.0, 46856.0,
42546.0, 107503.0, 93894.0, 112960.0, 75510.0, 104475.0, 149907.0, 27890.0,
50304.0, 151734.0, 120408.0, 124522.0, 36663.0, 29652.0, 61347.0, 62031.0,
49696.0, 45305.0, 39031.0, 37629.0, 100018.0, 28302.0, 194258.0, 150816.0,
26560.0, 62487.0, 39650.0, 75138.0, 158482.0, 93348.0, 193660.0, 90318.0,
77648.0, 76498.0, 167628.0, 30447.0, 93781.0, 57230.0, 42984.0, 35522.0,
47894.0, 68326.0, 70272.0, 46350.0, 197356.0, 131435.0, 49345.0, 89925.0,
87263.0, 46814.0, 98474.0, 124216.0, 49324.0, 45243.0, 29595.0, 116656.0,
33562.0, 53755.0, 31803.0, 68622.0, 42621.0, 91277.0, 32114.0, 146501.0,
145601.0, 152574.0, 40524.0, 80419.0, 37534.0, 38593.0, 55249.0, 49849.0,
42755.0, 78596.0, 112893.0, 95192.0, 31005.0, 80398.0, 98144.0, 89802.0,
48017.0, 45049.0, 50038.0, 44728.0, 168775.0, 174579.0, 30608.0, 25570.0,
34858.0, 135219.0, 143249.0, 95831.0, 160604.0, 99381.0, 33635.0, 65658.0,
41422.0, 50658.0, 54405.0, 191974.0, 132036.0, 42375.0, 134805.0, 25228.0,
172731.0, 81060.0, 38807.0, 41017.0, 46151.0, 155370.0, 94456.0, 48731.0,
71403.0, 42521.0, 112431.0, 54487.0, 25989.0, 53878.0, 44960.0, 101015.0,
145860.0, 26737.0, 78271.0, 93095.0, 82929.0, 141841.0, 89236.0, 94925.0,
28470.0, 27919.0, 71350.0, 29835.0, 127460.0, 140595.0, 192241.0, 81622.0,
165431.0, 136459.0, 36111.0, 167841.0, 99319.0, 71596.0, 27713.0, 31154.0,
52499.0, 30282.0, 39547.0, 40410.0, 144235.0, 76098.0, 94669.0, 47046.0,
38569.0, 146298.0, 44089.0, 86826.0, 29056.0, 123906.0, 28196.0, 28984.0,
77924.0, 47486.0, 68001.0, 95719.0, 33061.0, 79491.0, 172159.0, 82245.0,
87939.0, 38142.0, 94206.0, 119754.0, 25067.0, 29653.0, 41480.0, 97631.0,
34476.0, 43430.0, 37556.0, 28246.0, 30678.0, 46747.0, 61610.0, 41663.0, 91181.0,
32226.0, 88202.0, 91247.0, 30403.0, 25495.0, 59128.0, 46498.0, 116663.0,
182803.0, 44032.0, 70018.0, 170631.0, 43595.0, 144362.0, 28051.0, 42563.0,
29529.0, 25308.0, 41390.0, 88115.0, 97532.0, 30023.0, 134490.0, 44642.0,
92333.0, 96319.0, 87915.0, 131044.0, 63392.0, 81865.0, 46230.0, 142358.0,
35952.0, 30840.0, 115583.0, 143571.0, 90481.0, 37886.0, 124157.0, 48023.0,
39464.0, 35528.0, 138857.0, 85403.0, 95678.0, 52921.0, 116509.0, 36900.0,
199536.0, 43855.0, 93772.0, 136695.0, 80312.0, 143993.0, 28385.0, 25783.0,
69337.0, 42882.0, 29228.0, 49306.0, 49110.0, 37897.0, 36690.0, 44290.0, 51943.0,
34773.0, 120596.0, 133433.0, 29695.0, 131566.0, 94057.0, 106502.0, 167063.0,
46911.0, 36093.0, 52128.0, 37094.0, 45163.0, 103860.0, 43799.0, 45783.0,
96210.0, 61417.0, 75450.0, 109295.0, 110222.0, 44638.0, 30451.0, 46604.0,
146389.0, 80084.0, 34290.0, 86394.0, 75528.0, 85216.0, 37391.0, 37264.0,
38068.0, 27409.0, 69687.0, 126880.0, 77600.0, 196153.0, 48653.0, 93925.0,
29974.0, 138949.0, 84967.0, 52387.0, 98856.0, 42165.0, 114049.0, 109412.0,
80421.0, 47390.0, 38411.0, 145896.0, 44391.0, 35117.0, 34537.0, 43561.0,
181625.0, 41044.0, 97925.0, 50380.0, 127008.0, 43452.0, 180690.0, 80845.0,
86215.0, 31745.0, 29405.0, 29787.0, 43074.0, 59928.0, 58542.0, 95904.0, 77550.0,
25551.0, 90025.0, 108003.0, 85977.0, 36776.0, 194446.0, 125682.0, 122092.0,
31173.0, 58428.0, 75627.0, 66777.0, 111392.0, 53337.0, 105952.0, 136801.0,
43537.0, 56766.0, 29178.0, 46246.0, 47707.0, 25201.0, 67271.0, 100646.0,

75666.0, 39328.0, 29789.0, 188935.0, 37870.0, 104720.0, 53130.0, 82146.0,
122364.0, 61444.0, 169561.0, 89746.0, 46958.0, 91392.0, 71219.0, 34168.0,
88318.0, 107666.0, 78974.0, 32925.0, 67692.0, 30099.0, 163954.0, 32758.0,
30054.0, 30498.0, 143181.0, 93908.0, 187666.0, 27702.0, 158931.0, 72852.0,
83784.0, 27319.0, 91586.0, 119188.0, 48538.0, 80983.0, 119024.0, 36924.0,
26340.0, 37207.0, 72646.0, 31139.0, 33491.0, 189658.0, 35795.0, 98858.0,
89172.0, 121782.0, 49312.0, 27853.0, 84094.0, 28534.0, 56088.0, 119788.0,
163477.0, 95560.0, 35086.0, 26939.0, 25607.0, 26500.0, 60561.0, 69362.0,
99408.0, 114590.0, 30402.0, 84970.0, 35251.0, 87404.0, 31410.0, 117479.0,
69864.0, 34321.0, 25704.0, 181520.0, 25079.0, 31518.0, 30450.0, 49704.0,
82063.0, 32856.0, 45764.0, 67727.0, 32851.0, 49406.0, 98616.0, 101034.0,
64814.0, 43650.0, 31147.0, 93783.0, 37620.0, 27817.0, 56408.0, 93895.0, 80690.0,
43066.0, 47356.0, 42421.0, 41724.0, 72709.0, 40286.0, 30781.0, 96168.0, 91273.0,
60518.0, 52377.0, 42695.0, 47692.0, 41396.0, 42469.0, 139534.0, 42553.0,
44389.0, 32962.0, 146545.0, 48365.0, 30539.0, 94452.0, 86264.0, 28436.0,
54351.0, 55716.0, 41075.0, 61901.0, 65286.0, 146915.0, 143013.0, 27094.0,
178512.0, 53967.0, 44449.0, 37180.0, 25432.0, 149679.0, 57635.0, 41473.0,
33417.0, 42386.0, 32731.0, 71514.0, 41478.0, 48685.0, 94939.0, 60126.0, 43411.0,
130728.0, 42725.0, 52372.0, 191229.0, 45115.0, 34427.0, 51483.0, 44359.0,
144645.0, 85461.0, 35297.0, 137418.0, 64673.0, 25719.0, 30730.0, 76594.0,
46323.0, 158114.0, 134518.0, 113199.0, 157518.0, 47209.0, 40351.0, 38410.0,
86858.0, 60341.0, 55505.0, 185975.0, 107722.0, 70849.0, 36080.0, 69852.0,
101629.0, 49520.0, 92500.0, 70939.0, 107481.0, 38720.0, 43604.0, 171149.0,
36430.0, 46390.0, 135268.0, 47659.0, 50300.0, 34304.0, 46054.0, 78473.0,
144076.0, 30793.0, 25093.0, 36041.0, 53439.0, 38264.0, 28158.0, 126838.0,
34524.0, 45487.0, 43582.0, 170286.0, 25837.0, 109335.0, 60301.0, 69414.0,
40779.0, 157661.0, 76500.0, 32357.0, 123808.0, 168093.0, 29477.0, 63842.0,
48438.0, 37166.0, 36123.0, 38721.0, 44073.0, 62723.0, 47731.0, 43308.0, 40549.0,
56748.0, 36528.0, 87284.0, 25348.0, 126582.0, 130346.0, 40305.0, 146265.0,
41324.0, 91876.0, 57145.0, 49302.0, 174682.0, 38763.0, 89075.0, 59018.0,
74990.0, 38167.0, 173117.0, 28654.0, 106572.0, 37573.0, 63022.0, 45491.0,
119176.0, 78074.0, 33461.0, 25973.0, 139402.0, 130463.0, 41552.0, 57001.0,
47413.0, 46541.0, 46149.0, 167449.0, 139843.0, 137715.0, 59031.0, 123412.0,
49032.0, 82866.0, 51715.0, 43681.0, 59078.0, 116179.0, 131341.0, 45945.0,
107056.0, 55323.0, 178320.0, 89792.0, 112629.0, 95453.0, 38638.0, 89324.0,
67017.0, 47015.0, 109204.0, 59833.0, 94868.0, 71092.0, 31281.0, 34656.0,
96190.0, 92722.0, 25392.0, 142391.0, 31387.0, 98686.0, 88524.0, 47757.0,
140256.0, 92038.0, 96949.0, 139053.0, 37453.0, 37473.0, 84201.0, 146835.0,
66405.0, 32282.0, 46094.0, 73847.0, 55192.0, 45522.0, 27193.0, 27755.0, 97309.0,
55036.0, 97108.0, 189453.0, 28611.0, 119341.0, 44530.0, 55270.0, 48013.0,
54045.0, 116288.0, 111120.0, 131061.0, 35108.0, 37665.0, 68575.0, 31980.0,
104665.0, 40755.0, 36892.0, 44390.0, 196011.0, 99237.0, 44083.0, 41498.0,
43683.0, 45478.0, 44112.0, 43782.0, 30671.0, 79941.0, 65850.0, 68355.0, 51654.0,
104314.0, 186973.0, 65459.0, 32210.0, 80316.0, 76880.0, 27539.0, 53370.0,
36580.0, 38986.0, 122225.0, 30839.0, 74696.0, 46120.0, 167559.0, 92691.0,
36156.0, 64846.0, 40421.0, 34709.0, 40413.0, 53656.0, 77434.0, 83413.0, 80311.0,
56619.0, 128427.0, 142495.0, 49023.0, 41297.0, 70056.0, 150918.0, 174360.0,
30635.0, 80036.0, 35550.0, 82505.0, 45141.0, 26023.0, 91030.0, 167690.0,

107253.0, 27230.0, 44810.0, 62276.0, 47426.0, 36963.0, 86698.0, 32697.0,
81734.0, 79501.0, 33026.0, 27302.0, 49565.0, 27411.0, 41855.0, 76574.0, 40130.0,
95908.0, 47886.0, 116588.0, 50412.0, 82560.0, 92891.0, 61748.0, 115051.0,
36368.0, 125020.0, 30552.0, 29009.0, 95320.0, 61449.0, 48116.0, 40150.0,
42340.0, 30935.0, 37020.0, 102606.0, 26565.0, 68453.0, 51885.0, 112905.0,
38867.0, 110065.0, 67585.0, 55110.0, 71627.0, 44074.0, 35378.0, 41668.0,
33366.0, 89784.0, 50035.0, 46984.0, 34771.0, 36480.0, 32011.0, 84886.0, 31625.0,
37674.0, 80975.0, 30036.0, 90768.0, 49136.0, 36329.0, 111437.0, 75013.0,
98400.0, 41193.0, 149348.0, 174115.0, 91514.0, 109085.0, 29090.0, 33031.0,
37686.0, 85824.0, 76257.0, 74233.0, 28153.0, 33735.0, 36467.0, 129541.0,
42371.0, 70436.0, 73164.0, 31024.0, 38727.0, 30014.0, 128742.0, 45125.0,
31658.0, 62081.0, 104858.0, 26496.0, 52080.0, 150212.0, 49590.0, 33095.0,
106271.0, 48461.0, 182990.0, 70906.0, 59024.0, 57679.0, 29667.0, 38849.0,
60732.0, 153526.0, 115093.0, 25217.0, 83219.0, 144451.0, 31288.0, 199513.0,
129627.0, 94626.0, 39185.0, 31820.0, 178857.0, 148730.0, 62830.0, 48018.0,
31525.0, 100224.0, 93915.0, 55134.0, 55354.0, 174801.0, 27475.0, 42927.0,
176855.0, 153801.0, 83418.0, 99787.0, 87402.0, 39684.0, 149387.0, 33520.0,
48658.0, 67022.0, 77879.0, 62448.0, 69638.0, 29298.0, 36035.0, 168877.0,
139753.0, 37016.0, 47091.0, 38346.0, 135472.0, 113018.0, 168588.0, 27134.0,
47711.0, 40416.0, 32787.0, 74336.0, 99772.0, 35892.0, 96923.0, 42708.0,
103052.0, 96266.0, 55796.0, 30051.0, 31389.0, 48111.0, 35943.0, 73320.0,
117152.0, 52559.0, 37614.0, 79016.0, 163166.0, 89446.0, 70974.0, 34324.0,
47730.0, 109597.0, 173469.0, 192260.0, 33629.0, 48443.0, 160531.0, 39838.0,
39826.0, 48690.0, 91266.0, 59924.0, 63551.0, 103183.0, 36185.0, 31947.0,
199462.0, 138005.0, 71814.0, 44781.0, 102355.0, 86379.0, 29895.0, 44564.0,
28902.0, 34471.0, 85787.0, 47305.0, 99853.0, 77892.0, 31142.0, 44510.0, 88372.0,
64498.0, 78751.0, 48752.0, 48221.0, 104019.0, 66950.0, 88001.0, 80860.0,
72832.0, 146909.0, 51680.0, 55639.0, 44718.0, 45558.0, 32612.0, 87030.0,
190335.0, 27604.0, 59435.0, 124364.0, 37974.0, 101887.0, 143115.0, 99601.0,
41519.0, 33556.0, 148981.0, 137273.0, 31709.0, 53767.0, 32960.0, 121520.0,
38729.0, 112695.0, 147790.0, 86762.0, 91205.0, 92359.0, 55999.0, 26645.0,
33110.0, 97944.0, 95410.0, 67886.0, 96868.0, 198707.0, 92838.0, 186633.0,
30110.0, 70463.0, 28140.0, 34964.0, 130856.0, 67865.0, 145747.0, 169656.0,
38021.0, 29662.0, 28664.0, 176265.0, 88560.0, 89538.0, 27737.0, 38235.0,
94499.0, 33033.0, 119890.0, 142553.0, 114537.0, 34940.0, 103734.0, 172226.0,
31605.0, 46001.0, 71686.0, 57649.0, 155708.0, 146684.0, 86952.0, 40554.0,
125029.0, 124941.0, 93625.0, 153367.0, 95990.0, 83643.0, 37061.0, 143313.0,
47062.0, 79858.0, 112393.0, 40337.0, 43668.0, 94065.0, 41502.0, 156460.0,
71255.0, 88636.0, 126039.0, 135433.0, 52064.0, 126298.0, 104876.0, 57894.0,
90305.0, 49677.0, 68750.0, 36055.0, 69149.0, 77582.0, 79745.0, 41642.0,
132299.0, 57591.0, 53074.0, 104317.0, 27770.0, 127987.0, 29551.0, 83133.0,
65103.0, 82811.0, 127410.0, 131511.0, 26600.0, 40151.0, 59936.0, 51365.0,
92173.0, 46440.0, 116820.0, 135455.0, 49480.0, 106711.0, 69498.0, 195100.0,
136077.0, 68520.0, 40166.0, 138156.0, 46740.0, 43160.0, 32076.0, 80585.0,
39428.0, 112073.0, 130018.0, 127350.0, 50040.0, 147033.0, 38582.0, 42305.0,
101719.0, 40591.0, 35078.0, 32990.0, 124895.0, 81788.0, 54461.0, 146240.0,
34834.0, 109560.0, 105096.0, 134264.0, 123874.0, 79100.0, 145975.0, 137892.0,
48784.0, 40226.0, 109931.0, 33745.0, 119088.0, 26341.0, 50822.0, 112597.0,

92444.0, 30700.0, 41292.0, 45228.0, 191881.0, 62982.0, 42373.0, 198388.0,
108029.0, 50762.0, 30123.0, 43872.0, 65317.0, 32358.0, 80590.0, 90410.0,
155606.0, 50005.0, 25468.0, 98638.0, 144097.0, 49089.0, 65001.0, 98027.0,
93607.0, 31436.0, 57449.0, 57356.0, 123911.0, 148927.0, 38725.0, 165859.0,
49304.0, 27785.0, 88172.0, 130510.0, 43241.0, 34733.0, 138883.0, 168416.0,
48483.0, 71806.0, 128789.0, 171081.0, 85920.0, 25189.0, 33029.0, 86398.0,
45108.0, 45853.0, 99660.0, 139915.0, 171474.0, 147691.0, 180758.0, 83597.0,
68995.0, 130669.0, 30424.0, 49239.0, 65888.0, 56879.0, 41659.0, 67591.0,
81314.0, 66584.0, 107047.0, 96354.0, 81982.0, 44040.0, 28822.0, 105938.0,
107755.0, 95316.0, 51722.0, 92426.0, 88971.0, 76279.0, 87933.0, 34390.0,
47520.0, 32551.0, 81718.0, 125079.0, 182975.0, 83760.0, 174960.0, 155320.0,
143883.0, 111281.0, 45529.0, 67998.0, 35669.0, 25631.0, 164199.0, 83561.0,
104747.0, 75416.0, 43121.0, 68781.0, 110193.0, 130255.0, 28268.0, 31747.0,
43311.0, 68346.0, 81240.0, 94898.0, 57734.0, 68889.0, 88566.0, 98376.0,
129353.0, 31017.0, 75605.0, 49783.0, 43792.0, 47865.0, 144410.0, 28801.0,
105147.0, 42085.0, 57599.0, 53646.0, 25497.0, 160102.0, 31073.0, 94434.0,
35807.0, 32805.0, 48263.0, 37763.0, 56433.0, 59094.0, 95052.0, 180925.0,
93847.0, 59312.0, 65668.0, 26316.0, 34547.0, 178190.0, 59985.0, 84514.0,
151292.0, 46755.0, 45694.0, 27792.0, 47098.0, 30691.0, 45923.0, 101695.0,
85148.0, 50298.0, 141416.0, 76070.0, 109053.0, 63055.0, 45242.0, 48852.0,
83856.0, 63011.0, 26713.0, 91905.0, 103769.0, 27858.0, 121946.0, 120231.0,
144589.0, 101240.0, 48075.0, 125693.0, 42077.0, 69006.0, 44539.0, 99188.0,
76938.0, 30226.0, 76959.0, 71881.0, 47465.0, 63924.0, 29661.0, 157609.0,
153334.0, 117480.0, 114217.0, 37924.0, 65126.0, 54500.0, 140641.0, 43476.0,
47862.0, 43290.0, 33823.0, 30747.0, 39300.0, 76826.0, 74544.0, 72018.0, 77184.0,
38736.0, 37967.0, 27881.0, 83785.0, 129558.0, 31840.0, 60780.0, 51844.0,
42789.0, 42881.0, 104795.0, 48814.0, 32945.0, 37580.0, 193694.0, 26545.0,
59495.0, 173300.0, 78603.0, 145278.0, 96120.0, 169365.0, 173591.0, 45543.0,
92055.0, 26067.0, 42352.0, 83587.0, 29991.0, 137683.0, 86032.0, 73504.0,
71642.0, 31189.0, 25443.0, 133768.0, 123629.0, 51817.0, 37973.0, 85924.0,
146889.0, 140643.0, 69866.0, 86156.0, 28320.0, 67095.0, 27765.0, 86353.0,
39466.0, 92875.0, 161590.0, 92525.0, 27975.0, 170405.0, 124746.0, 36856.0,
162852.0, 83285.0, 66142.0, 112872.0, 84040.0, 166559.0, 133572.0, 47991.0,
32421.0, 27169.0, 96160.0, 57401.0, 145668.0, 70077.0, 85587.0, 34967.0,
95231.0, 34018.0, 36244.0, 96216.0, 71791.0, 45955.0, 25909.0, 114668.0,
90679.0, 27955.0, 94463.0, 87514.0, 45428.0, 29952.0, 67797.0, 137108.0,
40456.0, 102021.0, 71790.0, 99740.0, 71412.0, 25599.0, 120826.0, 66579.0,
55083.0, 85030.0, 59651.0, 33009.0, 98788.0, 26740.0, 78702.0, 44240.0, 43406.0,
69604.0, 27848.0, 46659.0, 34575.0, 40474.0, 44873.0, 98937.0, 40957.0, 64768.0,
129447.0, 85044.0, 61963.0, 39140.0, 33752.0, 99189.0, 191335.0, 30640.0,
112227.0, 35637.0, 41211.0, 33910.0, 64104.0, 77984.0, 66347.0, 41879.0,
25553.0, 67642.0, 189049.0, 138117.0, 79801.0, 35543.0, 136133.0, 90499.0,
26883.0, 44087.0, 167578.0, 76510.0, 95726.0, 91029.0, 36054.0, 88878.0,
112408.0, 83786.0, 57711.0, 35271.0, 33301.0, 41917.0, 25023.0, 95593.0,
40804.0, 47525.0, 54859.0, 37251.0, 46346.0, 30639.0, 65164.0, 40052.0, 78502.0,
31864.0, 45021.0, 137701.0, 108272.0, 36909.0, 85598.0, 44098.0, 83510.0,
98236.0, 176872.0, 35750.0, 160869.0, 183564.0, 37982.0, 131097.0, 156729.0,
56657.0, 47298.0, 46931.0, 80387.0, 67767.0, 130071.0, 73679.0, 35502.0,

74430.0, 74220.0, 38360.0, 42813.0, 107328.0, 46274.0, 46776.0, 135380.0,
61534.0, 47385.0, 47107.0, 67756.0, 83552.0, 53586.0, 90633.0, 97123.0, 52766.0,
74030.0, 65874.0, 195205.0, 44924.0, 60929.0, 53460.0, 35302.0, 31103.0,
58313.0, 91880.0, 37803.0, 133369.0, 140796.0, 63724.0, 95442.0, 41173.0,
105910.0, 87104.0, 44115.0, 30290.0, 28739.0, 114599.0, 39272.0, 91198.0,
28709.0, 162602.0, 196055.0, 88612.0, 35487.0, 143055.0, 37300.0, 48046.0,
183025.0, 28791.0, 65736.0, 132399.0, 37316.0, 34081.0, 27039.0, 35531.0,
53836.0, 40300.0, 57888.0, 45063.0, 87570.0, 103015.0, 36260.0, 45738.0,
95470.0, 33770.0, 50316.0, 161379.0, 48392.0, 72842.0, 49311.0, 77203.0,
41915.0, 47469.0, 36454.0, 49790.0, 78685.0, 48047.0, 136316.0, 73521.0,
31217.0, 33250.0, 54473.0, 33734.0, 125211.0, 71313.0, 72277.0, 148846.0,
129683.0, 143504.0, 115044.0, 189064.0, 90226.0, 187462.0, 126086.0, 92607.0,
88554.0, 53234.0, 120781.0, 133227.0, 88153.0, 156889.0, 79790.0, 132313.0,
124796.0, 51644.0, 77492.0, 194810.0, 38982.0, 33138.0, 61087.0, 139687.0,
125678.0, 46383.0, 157454.0, 33715.0, 40204.0, 129596.0, 49104.0, 68419.0,
35349.0, 28159.0, 126784.0, 45030.0, 184277.0, 35616.0, 66596.0, 25892.0,
98276.0, 43754.0, 109225.0, 69722.0, 143372.0, 67916.0, 117459.0, 66273.0,
54984.0, 88910.0, 81184.0, 47090.0, 72373.0, 30388.0, 120041.0, 75732.0,
38604.0, 31844.0, 93335.0, 78006.0, 40090.0, 114582.0, 49135.0, 47114.0,
72064.0, 46829.0, 50230.0, 66372.0, 45074.0, 31012.0, 111612.0, 120598.0,
52326.0, 60689.0, 141711.0, 94967.0, 111132.0, 49940.0, 55339.0, 49171.0,
80006.0, 39388.0, 187007.0, 25832.0, 32085.0, 62145.0, 74294.0, 48551.0,
50577.0, 105429.0, 99045.0, 117290.0, 25362.0, 35065.0, 110731.0, 97788.0,
41312.0, 36002.0, 43824.0, 127261.0, 33418.0, 44614.0, 116253.0, 25650.0,
88698.0, 80044.0, 43531.0, 118371.0, 29937.0, 45335.0, 38280.0, 41118.0,
48371.0, 37940.0, 31242.0, 99859.0, 124251.0, 100861.0, 54402.0, 125320.0,
38547.0, 136431.0, 113549.0, 34839.0, 49976.0, 61029.0, 36017.0, 35974.0,
31397.0, 39116.0, 34903.0, 90674.0, 44767.0, 199088.0, 25008.0, 39574.0,
40417.0, 47897.0, 114398.0, 32604.0, 99292.0, 142503.0, 57969.0, 27490.0,
39136.0, 119358.0, 143288.0, 93385.0, 34987.0, 30092.0, 112555.0, 162392.0,
97178.0, 89646.0, 111341.0, 92078.0, 65106.0, 147026.0, 57975.0, 34223.0,
40429.0, 46515.0, 25066.0, 34218.0, 28085.0, 40149.0, 25567.0, 27693.0, 28084.0,
39269.0, 54734.0, 98811.0, 72242.0, 57795.0, 88015.0, 74307.0, 42946.0,
134203.0, 49530.0, 104527.0, 97249.0, 138036.0, 109147.0, 120117.0, 84998.0,
38988.0, 59232.0, 145241.0, 29860.0, 39810.0, 129122.0, 144448.0, 96613.0,
102338.0, 40210.0, 86268.0, 141298.0, 28577.0, 76116.0, 114896.0, 82631.0,
48224.0, 33405.0, 145340.0, 41309.0, 163663.0, 55041.0, 92698.0, 87982.0,
41344.0, 72829.0, 69889.0, 39271.0, 57085.0, 139047.0, 178778.0, 74008.0,
153335.0, 29819.0, 55346.0, 32944.0, 38715.0, 122956.0, 28588.0, 36410.0,
59801.0, 93872.0, 31107.0, 173112.0, 84892.0, 151259.0, 83794.0, 43576.0,
80129.0, 33895.0, 97220.0, 35247.0, 30177.0, 26320.0, 31776.0, 85611.0,
100426.0, 158326.0, 53577.0, 89817.0, 56892.0, 36300.0, 95194.0, 38137.0,
56027.0, 63577.0, 91778.0, 186888.0, 64080.0, 140029.0, 189944.0, 31708.0,
56586.0, 113855.0, 147019.0, 65225.0, 166631.0, 92346.0, 188969.0, 73119.0,
95411.0, 51898.0, 125997.0, 120597.0, 44572.0, 83648.0, 74253.0, 73795.0,
62689.0, 165734.0, 81040.0, 34434.0, 76084.0, 31988.0, 35367.0, 138037.0,
26360.0, 29698.0, 79512.0, 46329.0, 44862.0, 134066.0, 54330.0, 29567.0,
44028.0, 46947.0, 43468.0, 28333.0, 31614.0, 80604.0, 111921.0, 28219.0,

```
99615.0, 79189.0, 93876.0, 97118.0, 78741.0, 34952.0, 31584.0, 165391.0,
43680.0, 34078.0, 107641.0, 45995.0, 34921.0, 175086.0, 29637.0, 44946.0,
47952.0, 26564.0, 31697.0, 42354.0, 181295.0, 32972.0, 96387.0, 26909.0,
64356.0, 58144.0, 64489.0, 71716.0, 71825.0, 78480.0, 105026.0, 55268.0,
47003.0, 72318.0, 67520.0, 35866.0, 119080.0, 25715.0, 77508.0, 43478.0,
37652.0, 82143.0, 46118.0, 40389.0, 125491.0, 85710.0, 47184.0, 142710.0,
38881.0, 95416.0, 92050.0, 39676.0, 82278.0, 31120.0, 68415.0, 26127.0, 35050.0,
47491.0, 181678.0, 45054.0, 41685.0, 94388.0, 116644.0, 180024.0, 96811.0,
39141.0, 96457.0, 40797.0, 27925.0, 45907.0, 95463.0, 25032.0, 37925.0,
160141.0, 44856.0, 26016.0, 140660.0, 74040.0, 39571.0, 102320.0, 93199.0,
40193.0, 105140.0, 95746.0, 80828.0, 32788.0, 87028.0, 31162.0, 49780.0,
73203.0, 35160.0, 142771.0, 80692.0, 39440.0, 40298.0, 115990.0, 38302.0,
37128.0, 64484.0, 113970.0, 49747.0, 32784.0, 132966.0, 103922.0, 99034.0,
36109.0, 34222.0, 144239.0, 123391.0, 30900.0, 63805.0, 144461.0, 50555.0,
104863.0, 67124.0, 84767.0, 43956.0, 194491.0, 40029.0, 46434.0, 36261.0,
99519.0, 145016.0, 51801.0, 137517.0, 78947.0, 194461.0, 93206.0, 176560.0,
135986.0, 145706.0, 34757.0, 55692.0, 79176.0, 36876.0, 143324.0, 182541.0,
160224.0, 162150.0, 173259.0, 38230.0, 44215.0, 56259.0, 36166.0, 31538.0,
38015.0, 45533.0, 69467.0, 29656.0, 25100.0, 51232.0, 29075.0, 67353.0, 45816.0,
58462.0, 37596.0, 146837.0, 119946.0, 145218.0, 30269.0, 135334.0, 175774.0,
174058.0, 59518.0, 120777.0, 90994.0, 38823.0, 64352.0, 82805.0, 90266.0,
90282.0, 91004.0, 47149.0, 77903.0, 149970.0, 74280.0, 128185.0, 39282.0,
164638.0, 70703.0, 133239.0, 38455.0, 133744.0, 147785.0, 40763.0, 93237.0,
102456.0, 133139.0, 32713.0, 166798.0, 159425.0, 144639.0, 121055.0, 35051.0,
33701.0, 77016.0, 56309.0, 49232.0, 47027.0, 38908.0, 68822.0, 31316.0,
105781.0, 73484.0, 27460.0, 69673.0, 48728.0, 45002.0, 134054.0, 37684.0,
35954.0, 69433.0, 29965.0, 177777.0, 45655.0, 79319.0, 33965.0, 106428.0,
44963.0, 31928.0, 104465.0, 28748.0, 49532.0, 44432.0, 39760.0, 36586.0,
115239.0, 176734.0, 49354.0, 30592.0, 69373.0, 94672.0, 104232.0, 32008.0,
37500.0, 71662.0, 71157.0, 45402.0, 150597.0, 47291.0, 134767.0, 118039.0,
31619.0, 94770.0, 37552.0, 72032.0, 80015.0, 88688.0, 95030.0, 53669.0, 48688.0,
41907.0, 25177.0, 184947.0, 57968.0, 133787.0, 167318.0, 93125.0, 37773.0,
86472.0, 134093.0, 58585.0, 30060.0, 93034.0, 120040.0, 30846.0, 36508.0,
42920.0, 33788.0, 38679.0, 34672.0]
Cardholder_Age:          [23.0, 49.0, nan, 52.0, 37.0, 80.0, 33.0, 46.0, 44.0,
77.0, 60.0, 79.0, 40.0, 61.0, 73.0, 34.0, 70.0, 18.0, 45.0, 39.0, 69.0, 47.0,
28.0, 30.0, 65.0, 31.0, 55.0, 62.0, 48.0, 26.0, 66.0, 57.0, 76.0, 20.0, 54.0,
35.0, 75.0, 53.0, 21.0, 27.0, 56.0, 19.0, 71.0, 29.0, 32.0, 63.0, 72.0, 41.0,
38.0, 64.0, 25.0, 58.0, 74.0, 78.0, 50.0, 68.0, 24.0, 36.0, 43.0, 22.0, 59.0,
42.0, 51.0, 67.0]
Cardholder_Monthly_Income:       [94632.0, 148118.0, 210921.0, 148070.0,
174470.0, 166671.0, 171991.0, 56248.0, 93854.0, 55448.0, 169305.0, 280150.0,
104930.0, 118139.0, 134547.0, 126542.0, 56209.0, 42973.0, 105035.0, 299154.0,
106545.0, 37379.0, 290396.0, 278123.0, 42234.0, 189117.0, nan, 126182.0,
165437.0, 279709.0, 210943.0, 169992.0, 136941.0, 84214.0, 200610.0, 140578.0,
87668.0, 162276.0, 43977.0, 108255.0, 253457.0, 141066.0, 89986.0, 126302.0,
119634.0, 132309.0, 73765.0, 133493.0, 145251.0, 184379.0, 106389.0, 59734.0,
154073.0, 111715.0, 112487.0, 143197.0, 80778.0, 291474.0, 84866.0, 184610.0,
```

116049.0, 115086.0, 112065.0, 293939.0, 219402.0, 42445.0, 103541.0, 53723.0,
196215.0, 70874.0, 51037.0, 73338.0, 190918.0, 297341.0, 88781.0, 143184.0,
209419.0, 128357.0, 57325.0, 264960.0, 152429.0, 50529.0, 192513.0, 43003.0,
55389.0, 63506.0, 290740.0, 195571.0, 156532.0, 247552.0, 104726.0, 45270.0,
63298.0, 38105.0, 59527.0, 72301.0, 115913.0, 47497.0, 153056.0, 141776.0,
74899.0, 216817.0, 281409.0, 64768.0, 41703.0, 110399.0, 216266.0, 148526.0,
200071.0, 45114.0, 166455.0, 147853.0, 259591.0, 189028.0, 290372.0, 103746.0,
131865.0, 112399.0, 205537.0, 243145.0, 270753.0, 176190.0, 83339.0, 272380.0,
288358.0, 62995.0, 43807.0, 85043.0, 230982.0, 61367.0, 268443.0, 106182.0,
159800.0, 148113.0, 37825.0, 73436.0, 189558.0, 265050.0, 72120.0, 59139.0,
50706.0, 179756.0, 164596.0, 133815.0, 123817.0, 66885.0, 132729.0, 297345.0,
72285.0, 275624.0, 112910.0, 70690.0, 42879.0, 216710.0, 70609.0, 210762.0,
119334.0, 130539.0, 126023.0, 220270.0, 124678.0, 46660.0, 115192.0, 140977.0,
138520.0, 49211.0, 192985.0, 45130.0, 245044.0, 158928.0, 143262.0, 105011.0,
132533.0, 186788.0, 60496.0, 211074.0, 198024.0, 148554.0, 78802.0, 241751.0,
82190.0, 211831.0, 221178.0, 42817.0, 213513.0, 151556.0, 46780.0, 52007.0,
133332.0, 78789.0, 130101.0, 35775.0, 114982.0, 43940.0, 218483.0, 136325.0,
173993.0, 218101.0, 272915.0, 42504.0, 38365.0, 125211.0, 128650.0, 83947.0,
170455.0, 67210.0, 295855.0, 74288.0, 192007.0, 35405.0, 141003.0, 36877.0,
104519.0, 49011.0, 75477.0, 44013.0, 197407.0, 157362.0, 53378.0, 49659.0,
64317.0, 55693.0, 297743.0, 208565.0, 47485.0, 237409.0, 93275.0, 271625.0,
152401.0, 145761.0, 148943.0, 150731.0, 131850.0, 174310.0, 237661.0, 245364.0,
61485.0, 238415.0, 141379.0, 121672.0, 86550.0, 116635.0, 49867.0, 67983.0,
149330.0, 44409.0, 285475.0, 210780.0, 75915.0, 143159.0, 163255.0, 123403.0,
138452.0, 176992.0, 212775.0, 38424.0, 132128.0, 162705.0, 204295.0, 68715.0,
205439.0, 72450.0, 141442.0, 206297.0, 230463.0, 50926.0, 246094.0, 110191.0,
90011.0, 71775.0, 185249.0, 208658.0, 147485.0, 164384.0, 212449.0, 178343.0,
46722.0, 84961.0, 135355.0, 156209.0, 146198.0, 37568.0, 178588.0, 127701.0,
106152.0, 46782.0, 70475.0, 63646.0, 218741.0, 43302.0, 180210.0, 105867.0,
38497.0, 65875.0, 172560.0, 63403.0, 37871.0, 121779.0, 161335.0, 66403.0,
145133.0, 48104.0, 237520.0, 139969.0, 146508.0, 154103.0, 152463.0, 176113.0,
205211.0, 270017.0, 248877.0, 157046.0, 38334.0, 58425.0, 120617.0, 261219.0,
148100.0, 43545.0, 98742.0, 193570.0, 44492.0, 152397.0, 231698.0, 62959.0,
194336.0, 141455.0, 199333.0, 195625.0, 40695.0, 54465.0, 44429.0, 214644.0,
108345.0, 218682.0, 54047.0, 260648.0, 210366.0, 74021.0, 88493.0, 172445.0,
225802.0, 98084.0, 219570.0, 42131.0, 93460.0, 80476.0, 54220.0, 50185.0,
150623.0, 237148.0, 254025.0, 64047.0, 199598.0, 108575.0, 120376.0, 58621.0,
105094.0, 87573.0, 191066.0, 43647.0, 280404.0, 66876.0, 227623.0, 58828.0,
43963.0, 113144.0, 172609.0, 150612.0, 146895.0, 75615.0, 135589.0, 119082.0,
153643.0, 73650.0, 99317.0, 37779.0, 77897.0, 222247.0, 166717.0, 65558.0,
214756.0, 52740.0, 119432.0, 146920.0, 37523.0, 137740.0, 220691.0, 114140.0,
267677.0, 72500.0, 201411.0, 106358.0, 40171.0, 151683.0, 158646.0, 88760.0,
134752.0, 112849.0, 144081.0, 191022.0, 257526.0, 178485.0, 61119.0, 135753.0,
105015.0, 69469.0, 299875.0, 64389.0, 46837.0, 142403.0, 179994.0, 186438.0,
192005.0, 45619.0, 56556.0, 88921.0, 119412.0, 36601.0, 214696.0, 148275.0,
160013.0, 180882.0, 221285.0, 127942.0, 97151.0, 112548.0, 109334.0, 285639.0,
259340.0, 143543.0, 237743.0, 138365.0, 214710.0, 194841.0, 148547.0, 74868.0,
86714.0, 59324.0, 198230.0, 179466.0, 231228.0, 170426.0, 199884.0, 280547.0,

135888.0, 169705.0, 79884.0, 213893.0, 219086.0, 195541.0, 64893.0, 89420.0,
148950.0, 266566.0, 74333.0, 130108.0, 147754.0, 289682.0, 53101.0, 45705.0,
105903.0, 172470.0, 103755.0, 58241.0, 100448.0, 141310.0, 83275.0, 70992.0,
287623.0, 160063.0, 196936.0, 181800.0, 141484.0, 98223.0, 177131.0, 105677.0,
293306.0, 126546.0, 97320.0, 197384.0, 275451.0, 253816.0, 120783.0, 74583.0,
166498.0, 162797.0, 208334.0, 235213.0, 35948.0, 235696.0, 182020.0, 271663.0,
112066.0, 220407.0, 104237.0, 74020.0, 193631.0, 78624.0, 42295.0, 151350.0,
286772.0, 197227.0, 123402.0, 94578.0, 71308.0, 178251.0, 298625.0, 208892.0,
40957.0, 87189.0, 66334.0, 150028.0, 203093.0, 236676.0, 293627.0, 153114.0,
100070.0, 74647.0, 246813.0, 206971.0, 58116.0, 52162.0, 165919.0, 70003.0,
90056.0, 110576.0, 45964.0, 216085.0, 93933.0, 144563.0, 144706.0, 135696.0,
74835.0, 264544.0, 39999.0, 71634.0, 235278.0, 93641.0, 193020.0, 52946.0,
91955.0, 126335.0, 123468.0, 51644.0, 148374.0, 212399.0, 99669.0, 182154.0,
121968.0, 206351.0, 169930.0, 131336.0, 137928.0, 46339.0, 215382.0, 50765.0,
186809.0, 124323.0, 187020.0, 165909.0, 35178.0, 111641.0, 93397.0, 66753.0,
262315.0, 95382.0, 42042.0, 256096.0, 61555.0, 133378.0, 69760.0, 53898.0,
184866.0, 212454.0, 278155.0, 274176.0, 56223.0, 297337.0, 122449.0, 118646.0,
294896.0, 146371.0, 82352.0, 233254.0, 186007.0, 49909.0, 123975.0, 134732.0,
201877.0, 298433.0, 142435.0, 51486.0, 101233.0, 74842.0, 282268.0, 153478.0,
171389.0, 149304.0, 167624.0, 95976.0, 118534.0, 60212.0, 126398.0, 114389.0,
55631.0, 47835.0, 217096.0, 179417.0, 79033.0, 112721.0, 54694.0, 46349.0,
147027.0, 213247.0, 61337.0, 180133.0, 159756.0, 144447.0, 191427.0, 46232.0,
149544.0, 72126.0, 114328.0, 61562.0, 58592.0, 118215.0, 142064.0, 169471.0,
156136.0, 156347.0, 205123.0, 120703.0, 264345.0, 67307.0, 91050.0, 280238.0,
44247.0, 280931.0, 131446.0, 276711.0, 210316.0, 110363.0, 253855.0, 57267.0,
268759.0, 234472.0, 91386.0, 192272.0, 48966.0, 157871.0, 130957.0, 124450.0,
102322.0, 144160.0, 96012.0, 229070.0, 271374.0, 63484.0, 105791.0, 61398.0,
270865.0, 155765.0, 276629.0, 225141.0, 40037.0, 176396.0, 137474.0, 260871.0,
139093.0, 58211.0, 122400.0, 39995.0, 244766.0, 216407.0, 44145.0, 38907.0,
155040.0, 146519.0, 55169.0, 176290.0, 146357.0, 178752.0, 144838.0, 135385.0,
61671.0, 143143.0, 197464.0, 223178.0, 92425.0, 141964.0, 213203.0, 56962.0,
166367.0, 44514.0, 105176.0, 102605.0, 118710.0, 180966.0, 106310.0, 54091.0,
146639.0, 132409.0, 51741.0, 282700.0, 48785.0, 138657.0, 153720.0, 84446.0,
199179.0, 47155.0, 90703.0, 64288.0, 193197.0, 298691.0, 175878.0, 190191.0,
105896.0, 295064.0, 95474.0, 66545.0, 149079.0, 135334.0, 72089.0, 69317.0,
100569.0, 58876.0, 280301.0, 90875.0, 43851.0, 281877.0, 82785.0, 117243.0,
288503.0, 64020.0, 182192.0, 218993.0, 57193.0, 132855.0, 141746.0, 57837.0,
175976.0, 78652.0, 129698.0, 69492.0, 142104.0, 173000.0, 111228.0, 130428.0,
130102.0, 88807.0, 182875.0, 70247.0, 140390.0, 112986.0, 136404.0, 41486.0,
113654.0, 109959.0, 230925.0, 149800.0, 41595.0, 178082.0, 70745.0, 48603.0,
200210.0, 148894.0, 164918.0, 232205.0, 219486.0, 108333.0, 100373.0, 86786.0,
44637.0, 151102.0, 46697.0, 141054.0, 177958.0, 65741.0, 86515.0, 198876.0,
116002.0, 136002.0, 53135.0, 194930.0, 192340.0, 215870.0, 197727.0, 212018.0,
132278.0, 164818.0, 158537.0, 93165.0, 126108.0, 183305.0, 81252.0, 55771.0,
64269.0, 113373.0, 95500.0, 93874.0, 136607.0, 206291.0, 199020.0, 154674.0,
141532.0, 215774.0, 184698.0, 68675.0, 70641.0, 75311.0, 285051.0, 72078.0,
201621.0, 40813.0, 129435.0, 51251.0, 65539.0, 106178.0, 206805.0, 111845.0,
71963.0, 145885.0, 109847.0, 106652.0, 189115.0, 135207.0, 193106.0, 46548.0,

148738.0, 107302.0, 95683.0, 35414.0, 220295.0, 195841.0, 233555.0, 47879.0,
39174.0, 63402.0, 137881.0, 62526.0, 53208.0, 149049.0, 116229.0, 35589.0,
106081.0, 266478.0, 80508.0, 180876.0, 282097.0, 45160.0, 145558.0, 123993.0,
73500.0, 60427.0, 42771.0, 71813.0, 40704.0, 66943.0, 36898.0, 60790.0,
117938.0, 177603.0, 141206.0, 70016.0, 115096.0, 55033.0, 116841.0, 113104.0,
209538.0, 211721.0, 205932.0, 50455.0, 50876.0, 252244.0, 156714.0, 106587.0,
219892.0, 35487.0, 148292.0, 54389.0, 172891.0, 200623.0, 39188.0, 58398.0,
119741.0, 272673.0, 163209.0, 58004.0, 177474.0, 299815.0, 171815.0, 195393.0,
48627.0, 248982.0, 44504.0, 49189.0, 37911.0, 84012.0, 41659.0, 172779.0,
59497.0, 172583.0, 268814.0, 101989.0, 148455.0, 289501.0, 98590.0, 91531.0,
177580.0, 188208.0, 108729.0, 113177.0, 38938.0, 228082.0, 76447.0, 111212.0,
115310.0, 264576.0, 38718.0, 145877.0, 184310.0, 205529.0, 106083.0, 178368.0,
227945.0, 80046.0, 54017.0, 152803.0, 85037.0, 169091.0, 277301.0, 63000.0,
123951.0, 168737.0, 55528.0, 114089.0, 276540.0, 198057.0, 73181.0, 294166.0,
117383.0, 155659.0, 166794.0, 140971.0, 73304.0, 283375.0, 193805.0, 68457.0,
189482.0, 209162.0, 143271.0, 222878.0, 62478.0, 234575.0, 140337.0, 124768.0,
148504.0, 156935.0, 125943.0, 112771.0, 233497.0, 43894.0, 138698.0, 187022.0,
119120.0, 37668.0, 264249.0, 232264.0, 107681.0, 196677.0, 204456.0, 201085.0,
149241.0, 114593.0, 133236.0, 171912.0, 160025.0, 132515.0, 98371.0, 288120.0,
73203.0, 111819.0, 129432.0, 92354.0, 213132.0, 51007.0, 162499.0, 254000.0,
155941.0, 73820.0, 136500.0, 196232.0, 78265.0, 94502.0, 91074.0, 209080.0,
59401.0, 81937.0, 226257.0, 217291.0, 109311.0, 63401.0, 274755.0, 142418.0,
121726.0, 207510.0, 50515.0, 106015.0, 72031.0, 65845.0, 184566.0, 292906.0,
83869.0, 58694.0, 138486.0, 69754.0, 82568.0, 137994.0, 224471.0, 116086.0,
155366.0, 277015.0, 144872.0, 91195.0, 75430.0, 238029.0, 157119.0, 145620.0,
72432.0, 184483.0, 158639.0, 125060.0, 111382.0, 56961.0, 132771.0, 65441.0,
77505.0, 109749.0, 172635.0, 126866.0, 60083.0, 133281.0, 74972.0, 190570.0,
219303.0, 90221.0, 44968.0, 137933.0, 130934.0, 187325.0, 69315.0, 36376.0,
53015.0, 202073.0, 62609.0, 172947.0, 63293.0, 166567.0, 79003.0, 68307.0,
207659.0, 277972.0, 158918.0, 175497.0, 240659.0, 185833.0, 207667.0, 131411.0,
123343.0, 280859.0, 176895.0, 188960.0, 109727.0, 177535.0, 214673.0, 44605.0,
72669.0, 142656.0, 142261.0, 52350.0, 53586.0, 97475.0, 70019.0, 75508.0,
104568.0, 178079.0, 38932.0, 41714.0, 172948.0, 100977.0, 109332.0, 113965.0,
274534.0, 234948.0, 138319.0, 121787.0, 177777.0, 143471.0, 131358.0, 147148.0,
72655.0, 120185.0, 245072.0, 142417.0, 88537.0, 177570.0, 176887.0, 37192.0,
151693.0, 94022.0, 146820.0, 179711.0, 36642.0, 172664.0, 96015.0, 197601.0,
128214.0, 153294.0, 296844.0, 41300.0, 144821.0, 158954.0, 102835.0, 193380.0,
227858.0, 250737.0, 141174.0, 46677.0, 211263.0, 92457.0, 237091.0, 121813.0,
51446.0, 45238.0, 176348.0, 146623.0, 279023.0, 103726.0, 179902.0, 211679.0,
179165.0, 135331.0, 215805.0, 219682.0, 263482.0, 148655.0, 47368.0, 79217.0,
132732.0, 98036.0, 113714.0, 74884.0, 126238.0, 152984.0, 125378.0, 118809.0,
68401.0, 183959.0, 106567.0, 42655.0, 111941.0, 100244.0, 60656.0, 57856.0,
93763.0, 287711.0, 49748.0, 72226.0, 184639.0, 56718.0, 45275.0, 157130.0,
61339.0, 159056.0, 42317.0, 192414.0, 151458.0, 251709.0, 187926.0, 121893.0,
37162.0, 174981.0, 140540.0, 65560.0, 87924.0, 60544.0, 65518.0, 57918.0,
68754.0, 205554.0, 151498.0, 63855.0, 215904.0, 82299.0, 165666.0, 46292.0,
207584.0, 37837.0, 144980.0, 41772.0, 54512.0, 67406.0, 147305.0, 269662.0,
271124.0, 238412.0, 126399.0, 118756.0, 262747.0, 178834.0, 155641.0, 60377.0,

221964.0, 189067.0, 213506.0, 125701.0, 102222.0, 178914.0, 143812.0, 41216.0,
149296.0, 64332.0, 168133.0, 144599.0, 140502.0, 212196.0, 79442.0, 38869.0,
143193.0, 203917.0, 217752.0, 292875.0, 223141.0, 177219.0, 61633.0, 43002.0,
195488.0, 113422.0, 180104.0, 102326.0, 48677.0, 220402.0, 52718.0, 39835.0,
84176.0, 106354.0, 113316.0, 84497.0, 62987.0, 176812.0, 261448.0, 244084.0,
136107.0, 186921.0, 64384.0, 288747.0, 107936.0, 229045.0, 217488.0, 76358.0,
193436.0, 74991.0, 49270.0, 85115.0, 36307.0, 251674.0, 45892.0, 126574.0,
97206.0, 99295.0, 246614.0, 63268.0, 54776.0, 69708.0, 70500.0, 299500.0,
75465.0, 50202.0, 103791.0, 71616.0, 161751.0, 147446.0, 148711.0, 109158.0,
218422.0, 198180.0, 36552.0, 81148.0, 216868.0, 154915.0, 71524.0, 198951.0,
74830.0, 254650.0, 93991.0, 53605.0, 180912.0, 74023.0, 68382.0, 188329.0,
216153.0, 106827.0, 80273.0, 60692.0, 52788.0, 143258.0, 66432.0, 57242.0,
213794.0, 40774.0, 200771.0, 106928.0, 231302.0, 204082.0, 123606.0, 169099.0,
71701.0, 66615.0, 125805.0, 42122.0, 69155.0, 242255.0, 73019.0, 123175.0,
101171.0, 142932.0, 255140.0, 53594.0, 187688.0, 96359.0, 109507.0, 126615.0,
111530.0, 57203.0, 84289.0, 215792.0, 269267.0, 140305.0, 119840.0, 70767.0,
215734.0, 221379.0, 97299.0, 145387.0, 221050.0, 63251.0, 198651.0, 43471.0,
168950.0, 184558.0, 127102.0, 193116.0, 134324.0, 70169.0, 115056.0, 178543.0,
223366.0, 190256.0, 113626.0, 127614.0, 74502.0, 82152.0, 111562.0, 70735.0,
107727.0, 146054.0, 246786.0, 163259.0, 222435.0, 128670.0, 159268.0, 38217.0,
39233.0, 260424.0, 105319.0, 196437.0, 246777.0, 133288.0, 184456.0, 45390.0,
42851.0, 212346.0, 73031.0, 246181.0, 95836.0, 90558.0, 169501.0, 37993.0,
221060.0, 78951.0, 146181.0, 54758.0, 46007.0, 246649.0, 105301.0, 175021.0,
48682.0, 196591.0, 113484.0, 124911.0, 196400.0, 174510.0, 83825.0, 61301.0,
128971.0, 192691.0, 53283.0, 210383.0, 140107.0, 132703.0, 72353.0, 114938.0,
241051.0, 37244.0, 153011.0, 193956.0, 130811.0, 47167.0, 144974.0, 61245.0,
139311.0, 84456.0, 95853.0, 121431.0, 205461.0, 151106.0, 80110.0, 50340.0,
45535.0, 268714.0, 71841.0, 71044.0, 116881.0, 90437.0, 47614.0, 118657.0,
36600.0, 152454.0, 91640.0, 147956.0, 36526.0, 51086.0, 42045.0, 263787.0,
51365.0, 299907.0, 62154.0, 119542.0, 154972.0, 106177.0, 141128.0, 262626.0,
172594.0, 149525.0, 125405.0, 163618.0, 61160.0, 107402.0, 126958.0, 60379.0,
149133.0, 241013.0, 96226.0, 142976.0, 133279.0, 46157.0, 106021.0, 114963.0,
290947.0, 71672.0, 110626.0, 53155.0, 273414.0, 196321.0, 146369.0, 141537.0,
142252.0, 50732.0, 124641.0, 274365.0, 210111.0, 116416.0, 145072.0, 203122.0,
210654.0, 49138.0, 146077.0, 111887.0, 65267.0, 149783.0, 177487.0, 174600.0,
133580.0, 286245.0, 57560.0, 249062.0, 44752.0, 146737.0, 202046.0, 134074.0,
47448.0, 43369.0, 221052.0, 45833.0, 130534.0, 97621.0, 46163.0, 139640.0,
122249.0, 193191.0, 45924.0, 166093.0, 81093.0, 98099.0, 212178.0, 51428.0,
108671.0, 138027.0, 178768.0, 56320.0, 112078.0, 299818.0, 127706.0, 141121.0,
38065.0, 146353.0, 233293.0, 284098.0, 211124.0, 119800.0, 280284.0, 198946.0,
165021.0, 102963.0, 61589.0, 106320.0, 243300.0, 144978.0, 37469.0, 141031.0,
108709.0, 119248.0, 258070.0, 87839.0, 161377.0, 206358.0, 186207.0, 191218.0,
165204.0, 48865.0, 75126.0, 44587.0, 59583.0, 224672.0, 59170.0, 153381.0,
277687.0, 281222.0, 151349.0, 38566.0, 287927.0, 95688.0, 103893.0, 107246.0,
73155.0, 192176.0, 155438.0, 133554.0, 241787.0, 236896.0, 73079.0, 151032.0,
80662.0, 211966.0, 72410.0, 37513.0, 183714.0, 136130.0, 114896.0, 165772.0,
84202.0, 195256.0, 105826.0, 118890.0, 92474.0, 219267.0, 145969.0, 143487.0,
97091.0, 206712.0, 186213.0, 114493.0, 216585.0, 130159.0, 131816.0, 220974.0,

119919.0, 173916.0, 165525.0, 253254.0, 67981.0, 139726.0, 142134.0, 105958.0,
78803.0, 47921.0, 72811.0, 269132.0, 65943.0, 82631.0, 104603.0, 56009.0,
255197.0, 118246.0, 148745.0, 45891.0, 184865.0, 37663.0, 224436.0, 223140.0,
108012.0, 138209.0, 256908.0, 132507.0, 146609.0, 59970.0, 42396.0, 35540.0,
107148.0, 43689.0, 133350.0, 77769.0, 166001.0, 120757.0, 61497.0, 71976.0,
81655.0, 206320.0, 64294.0, 198137.0, 262146.0, 109828.0, 220429.0, 281142.0,
90736.0, 154647.0, 137296.0, 174235.0, 246153.0, 75978.0, 69249.0, 72197.0,
215723.0, 279175.0, 74925.0, 84705.0, 49717.0, 72260.0, 223071.0, 208833.0,
199504.0, 116365.0, 209383.0, 183353.0, 110949.0, 66734.0, 82220.0, 175773.0,
211797.0, 40361.0, 124146.0, 214653.0, 50939.0, 169684.0, 53339.0, 210322.0,
146548.0, 290578.0, 87754.0, 128267.0, 106852.0, 115663.0, 215738.0, 52380.0,
248177.0, 108763.0, 63432.0, 42605.0, 288216.0, 74298.0, 146971.0, 159812.0,
147470.0, 276311.0, 46043.0, 255814.0, 115693.0, 187574.0, 153850.0, 151311.0,
110924.0, 114541.0, 112345.0, 42746.0, 177116.0, 110160.0, 63147.0, 195921.0,
234957.0, 71534.0, 57650.0, 145033.0, 277845.0, 290354.0, 111783.0, 138037.0,
139755.0, 81447.0, 46382.0, 256107.0, 115689.0, 171623.0, 137209.0, 105631.0,
101459.0, 210764.0, 159738.0, 196080.0, 193166.0, 223162.0, 137298.0, 271708.0,
129834.0, 252362.0, 198704.0, 50339.0, 146178.0, 128323.0, 37892.0, 273606.0,
181688.0, 227081.0, 168887.0, 173161.0, 60657.0, 41190.0, 193641.0, 203711.0,
149068.0, 44711.0, 184361.0, 122957.0, 146185.0, 52668.0, 82953.0, 125935.0,
65642.0, 41833.0, 112809.0, 209885.0, 153145.0, 36778.0, 74406.0, 135309.0,
72777.0, 151172.0, 128711.0, 241262.0, 54933.0, 166174.0, 93185.0, 93707.0,
50929.0, 154386.0, 56318.0, 140857.0, 37484.0, 296571.0, 146842.0, 40724.0,
151933.0, 81628.0, 129785.0, 147347.0, 54342.0, 41031.0, 201794.0, 77054.0,
64309.0, 124337.0, 129107.0, 174682.0, 44515.0, 264479.0, 162368.0, 127300.0,
50213.0, 132453.0, 82094.0, 162031.0, 64024.0, 49407.0, 58365.0, 235980.0,
243013.0, 37719.0, 70048.0, 184407.0, 50470.0, 53617.0, 147873.0, 153742.0,
86365.0, 98731.0, 145051.0, 260542.0, 212560.0, 73983.0, 193499.0, 134556.0,
63987.0, 127083.0, 168705.0, 230385.0, 206720.0, 184347.0, 104362.0, 202786.0,
292845.0, 122137.0, 57253.0, 180640.0, 261832.0, 59473.0, 82392.0, 179822.0,
120232.0, 69311.0, 271184.0, 140821.0, 61627.0, 54305.0, 187561.0, 44560.0,
119323.0, 41344.0, 188514.0, 113051.0, 168568.0, 126655.0, 248880.0, 228283.0,
77807.0, 123866.0, 223171.0, 138047.0, 184261.0, 40713.0, 46885.0, 256042.0,
71992.0, 252458.0, 140992.0, 108182.0, 155297.0, 121720.0, 40018.0, 213536.0,
132723.0, 40520.0, 62589.0, 63363.0, 57398.0, 134800.0, 147085.0, 155640.0,
158054.0, 164961.0, 70552.0, 194591.0, 193301.0, 191944.0, 236726.0, 56364.0,
283460.0, 130321.0, 261467.0, 182111.0, 240465.0, 39876.0, 100484.0, 160665.0,
144557.0, 298725.0, 150014.0, 68633.0, 225733.0, 129504.0, 63163.0, 278817.0,
60793.0, 51727.0, 176096.0, 171945.0, 92873.0, 78498.0, 227896.0, 146732.0,
51393.0, 120209.0, 139863.0, 102915.0, 71899.0, 284952.0, 58864.0, 74480.0,
146125.0, 105993.0, 153097.0, 153821.0, 41881.0, 167161.0, 35583.0, 109587.0,
102554.0, 55323.0, 286517.0, 210270.0, 248263.0, 143518.0, 108227.0, 95587.0,
49346.0, 108433.0, 63310.0, 176445.0, 153180.0, 174730.0, 253272.0, 57479.0,
97631.0, 231407.0, 116156.0, 109487.0, 215930.0, 295072.0, 210390.0, 203815.0,
50058.0, 53089.0, 36258.0, 189756.0, 44681.0, 135976.0, 145950.0, 272503.0,
39423.0, 127391.0, 97251.0, 83833.0, 130249.0, 139506.0, 191755.0, 76090.0,
160758.0, 218208.0, 189713.0, 93291.0, 187232.0, 138622.0, 150261.0, 157756.0,
77511.0, 74888.0, 58620.0, 97082.0, 84849.0, 46164.0, 160798.0, 147769.0,

41460.0, 293060.0, 54522.0, 50450.0, 264051.0, 178823.0, 261764.0, 86627.0,
70190.0, 278563.0, 96376.0, 134379.0, 71451.0, 37922.0, 297078.0, 299467.0,
206059.0, 167607.0, 193733.0, 121153.0, 174374.0, 70840.0, 169262.0, 72359.0,
150543.0, 156826.0, 204350.0, 128440.0, 132619.0, 177914.0, 195987.0, 109465.0,
65089.0, 55517.0, 126454.0, 149530.0, 70531.0, 198890.0, 156849.0, 216177.0,
81826.0, 142312.0, 209292.0, 199426.0, 72839.0, 85362.0, 219217.0, 241477.0,
289236.0, 161539.0, 90883.0, 169320.0, 128147.0, 274162.0, 209664.0, 109799.0,
168984.0, 222879.0, 191985.0, 161602.0, 145832.0, 288884.0, 140357.0, 69433.0,
153351.0, 99107.0, 40993.0, 132731.0, 41594.0, 149380.0, 218917.0, 37169.0,
142528.0, 149845.0, 155958.0, 126446.0, 56735.0, 125641.0, 292206.0, 223005.0,
40694.0, 179232.0, 176047.0, 131485.0, 136152.0, 147355.0, 63938.0, 110043.0,
156641.0, 75220.0, 197813.0, 148646.0, 120805.0, 59917.0, 174555.0, 74667.0,
163834.0, 207616.0, 117872.0, 250716.0, 275880.0, 112109.0, 64496.0, 205804.0,
120517.0, 52006.0, 122380.0, 130797.0, 99016.0, 70315.0, 66693.0, 60898.0,
49464.0, 109001.0, 241818.0, 184782.0, 137512.0, 200359.0, 103445.0, 203895.0,
226036.0, 217440.0, 289988.0, 117471.0, 178191.0, 116678.0, 43629.0, 47134.0,
154214.0, 258214.0, 173396.0, 107426.0, 158946.0, 112793.0, 220456.0, 272874.0,
271024.0, 62534.0, 41487.0, 190736.0, 145136.0, 85014.0, 160437.0, 206031.0,
128450.0, 58535.0, 270301.0, 145665.0, 85685.0, 57132.0, 42552.0, 149273.0,
253145.0, 111755.0, 37091.0, 112566.0, 95572.0, 107790.0, 47546.0, 134476.0,
235742.0, 111089.0, 62807.0, 253936.0, 88382.0, 65105.0, 208727.0, 260305.0,
48908.0, 142820.0, 133755.0, 36237.0, 61204.0, 136407.0, 272794.0, 112559.0,
52974.0, 171169.0, 41897.0, 47164.0, 63090.0, 106724.0, 115758.0, 207963.0,
110647.0, 161670.0, 58977.0, 191624.0, 45931.0, 197689.0, 117117.0, 63377.0,
37197.0, 157357.0, 70908.0, 80707.0, 122344.0, 55569.0, 71618.0, 78656.0,
158374.0, 141063.0, 185055.0, 165592.0, 195612.0, 45972.0, 100990.0, 43444.0,
144825.0, 43946.0, 41533.0, 266888.0, 221763.0, 161985.0, 40543.0, 155450.0,
126572.0, 110322.0, 88405.0, 161847.0, 148475.0, 59325.0, 55975.0, 100090.0,
43209.0, 142851.0, 129022.0, 227059.0, 57468.0, 160215.0, 159267.0, 227043.0,
299278.0, 56251.0, 48311.0, 75504.0, 123363.0, 69096.0, 201226.0, 44204.0,
127717.0, 201732.0, 83224.0, 124782.0, 231310.0, 51940.0, 86524.0, 195884.0,
190587.0, 36134.0, 60068.0, 144798.0, 39206.0, 58461.0, 44294.0, 297523.0,
102356.0, 271729.0, 198170.0, 70159.0, 148462.0, 64638.0, 267117.0, 127064.0,
121059.0, 163978.0, 153577.0, 299609.0, 206045.0, 109643.0, 35139.0, 62811.0,
205048.0, 94995.0, 225818.0, 56077.0, 52705.0, 59251.0, 183574.0, 181844.0,
199523.0, 280445.0, 46463.0, 273846.0, 296564.0, 59568.0, 283184.0, 42921.0,
35863.0, 125420.0, 109078.0, 148813.0, 134467.0, 161028.0, 177076.0, 136658.0,
232313.0, 138264.0, 211502.0, 290125.0, 50317.0, 155876.0, 173821.0, 129601.0,
158521.0, 64974.0, 151216.0, 246601.0, 230909.0, 103984.0, 60874.0, 41842.0,
36439.0, 105734.0, 180916.0, 111208.0, 37928.0, 78048.0, 51505.0, 219957.0,
267925.0, 278307.0, 199870.0, 296962.0, 291599.0, 63170.0, 89928.0, 121029.0,
41040.0, 46016.0, 128667.0, 70903.0, 124806.0, 99882.0, 201087.0, 84312.0,
281373.0, 42153.0, 43942.0, 41157.0, 101340.0, 50586.0, 70595.0, 248991.0,
273733.0, 147039.0, 198501.0, 111994.0, 123861.0, 189545.0, 124600.0, 266000.0,
122664.0, 54586.0, 45047.0, 57299.0, 53990.0, 262785.0, 151369.0, 217665.0,
144385.0, 130889.0, 95591.0, 116411.0, 133058.0, 115135.0, 63561.0, 61636.0,
299000.0, 36672.0, 246615.0, 84772.0, 78800.0, 47549.0, 150618.0, 56555.0,
70078.0, 163194.0, 158931.0, 235402.0, 198719.0, 47801.0, 136036.0, 274913.0,

35005.0, 159254.0, 71368.0, 65987.0, 227826.0, 215961.0, 123001.0, 105565.0,
141026.0, 35254.0, 202803.0, 178861.0, 117498.0, 209370.0, 193495.0, 163386.0,
179755.0, 189116.0, 269817.0, 201776.0, 56067.0, 221740.0, 101764.0, 148271.0,
75950.0, 71710.0, 39027.0, 149876.0, 121167.0, 112339.0, 42924.0, 211257.0,
213850.0, 128872.0, 211699.0, 58545.0, 116070.0, 298431.0, 239316.0, 105157.0,
112564.0, 65072.0, 120034.0, 136065.0, 66568.0, 248135.0, 73480.0, 70539.0,
105175.0, 38170.0, 106735.0, 43685.0, 99060.0, 36212.0, 118830.0, 113478.0,
222255.0, 107177.0, 72303.0, 86767.0, 151745.0, 191057.0, 135651.0, 253043.0,
56762.0, 91399.0, 52822.0, 56057.0, 179648.0, 117686.0, 71527.0, 290611.0,
65915.0, 192367.0, 61148.0, 105268.0, 220038.0, 132248.0, 74897.0, 47743.0,
47948.0, 208970.0, 80301.0, 102959.0, 74905.0, 47028.0, 57778.0, 124623.0,
210277.0, 142590.0, 182641.0, 219737.0, 191795.0, 167254.0, 67827.0, 118302.0,
133628.0, 165719.0, 211468.0, 178829.0, 254316.0, 56711.0, 128535.0, 87279.0,
120755.0, 42738.0, 218387.0, 253398.0, 73283.0, 167108.0, 124689.0, 75905.0,
155813.0, 35671.0, 72347.0, 63741.0, 205334.0, 140985.0, 114048.0, 143108.0,
77582.0, 295117.0, 147115.0, 39033.0, 48606.0, 210963.0, 199121.0, 96957.0,
196535.0, 167679.0, 185642.0, 147990.0, 36335.0, 134749.0, 35555.0, 273631.0,
47034.0, 185038.0, 100480.0, 229527.0, 148572.0, 67147.0, 47942.0, 36609.0,
71210.0, 103385.0, 118785.0, 129189.0, 84903.0, 260014.0, 273527.0, 151064.0,
206287.0, 126996.0, 230524.0, 59820.0, 135875.0, 135807.0, 197658.0, 124344.0,
116774.0, 81672.0, 133909.0, 73165.0, 95130.0, 129789.0, 86105.0, 277653.0,
274223.0, 190971.0, 173202.0, 58731.0, 57700.0, 146816.0, 114258.0, 205228.0,
37472.0, 52230.0, 225708.0, 104579.0, 252782.0, 121275.0, 165432.0, 261345.0,
35722.0, 187393.0, 210300.0, 260062.0, 149064.0, 89547.0, 180038.0, 140176.0,
120257.0, 171051.0, 71045.0, 67907.0, 106426.0, 270241.0, 220048.0, 269742.0,
236347.0, 61745.0, 201816.0, 81801.0, 194061.0, 227774.0, 220321.0, 169925.0,
93664.0, 121334.0, 88245.0, 186819.0, 69716.0, 107256.0, 138876.0, 108474.0,
110425.0, 59796.0, 118409.0, 85398.0, 51640.0, 278888.0, 164592.0, 60121.0,
100954.0, 133494.0, 35610.0, 180082.0, 167734.0, 147084.0, 251371.0, 74374.0,
62140.0, 196009.0, 152026.0, 134771.0, 107461.0, 169949.0, 183776.0, 129175.0,
77469.0, 147166.0, 110913.0, 181559.0, 58930.0, 120141.0, 209776.0, 59003.0,
87928.0, 105894.0, 72422.0, 86582.0, 292104.0, 196271.0, 151456.0, 46973.0,
167369.0, 120009.0, 71952.0, 156082.0, 252641.0, 144857.0, 148043.0, 187683.0,
57485.0, 165752.0, 72429.0, 185174.0, 194613.0, 256936.0, 232115.0, 137203.0,
164754.0, 212613.0, 70612.0, 123431.0, 176325.0, 275124.0, 166572.0, 65926.0,
116319.0, 93474.0, 296995.0, 73157.0, 272396.0, 57320.0, 46709.0, 283864.0,
171663.0, 145365.0, 60248.0, 132253.0, 150265.0, 43616.0, 185131.0, 61927.0,
294161.0, 292377.0, 94325.0, 122261.0, 267510.0, 106646.0, 207122.0, 200306.0,
146625.0, 100705.0, 38283.0, 98274.0, 46004.0, 271846.0, 174625.0, 194437.0,
106976.0, 182056.0, 197543.0, 277521.0, 185145.0, 159110.0, 57578.0, 204288.0,
212430.0, 276769.0, 135908.0, 59575.0, 267157.0, 173344.0, 205271.0, 58084.0,
185337.0, 159471.0, 67795.0, 67088.0, 151454.0, 64401.0, 145772.0, 128954.0,
243920.0, 185028.0, 119094.0, 50860.0, 125801.0, 234817.0, 209069.0, 243533.0,
47204.0, 79583.0, 241610.0, 39478.0, 45748.0, 38141.0, 73627.0, 91858.0,
62011.0, 69395.0, 286997.0, 292852.0, 117373.0, 101834.0, 124053.0, 287000.0,
62766.0, 109123.0, 176246.0, 60866.0, 54319.0, 119715.0, 167197.0, 156944.0,
229529.0, 84968.0, 201612.0, 174159.0, 127372.0, 74190.0, 236256.0, 113311.0,
174072.0, 257270.0, 133419.0, 130077.0, 200019.0, 126219.0, 249865.0, 37107.0,

189791.0, 108174.0, 144836.0, 184720.0, 286301.0, 83979.0, 112340.0, 237628.0,
144106.0, 293520.0, 108197.0, 214722.0, 121006.0, 60440.0, 157921.0, 58897.0,
286478.0, 42641.0, 171222.0, 197712.0, 96714.0, 213980.0, 193173.0, 47340.0,
298349.0, 64225.0, 260018.0, 111003.0, 174268.0, 132875.0, 175530.0, 68743.0,
144091.0, 121111.0, 148346.0, 68085.0, 131350.0, 41787.0, 65469.0, 145660.0,
224650.0, 242416.0, 172574.0, 216613.0, 172314.0, 136836.0, 175211.0, 70109.0,
117940.0, 148958.0, 114378.0, 73721.0, 144920.0, 93555.0, 56401.0, 97497.0,
161042.0, 236866.0, 193309.0, 152636.0, 51396.0, 133064.0, 36206.0, 225291.0,
261716.0, 135883.0, 88506.0, 202537.0, 69946.0, 45320.0, 69229.0, 117417.0,
190895.0, 262510.0, 285102.0, 69459.0, 160553.0, 71029.0, 181803.0, 132726.0,
76630.0, 135865.0, 149518.0, 292191.0, 163075.0, 212168.0, 72459.0, 45073.0,
252099.0, 246688.0, 55005.0, 118281.0, 52921.0, 213114.0, 42056.0, 120302.0,
104058.0, 266775.0, 293240.0, 108458.0, 72530.0, 89680.0, 183724.0, 54754.0,
189079.0, 150335.0, 80494.0, 218458.0, 173606.0, 215653.0, 70234.0, 183235.0,
123589.0, 207862.0, 188445.0, 105687.0, 136927.0, 110130.0, 127188.0, 274257.0,
118668.0, 190978.0, 35566.0, 270929.0, 84828.0, 108341.0, 72554.0, 38086.0,
217104.0, 262697.0, 87265.0, 202773.0, 213942.0, 193096.0, 45844.0, 253142.0,
205995.0, 177939.0, 155636.0, 162474.0, 144935.0, 71765.0, 161999.0, 83334.0,
164871.0, 136548.0, 275705.0, 111033.0, 200719.0, 162563.0, 144088.0, 190503.0,
93437.0, 62932.0, 134386.0, 116304.0, 104710.0, 264115.0, 199327.0, 99394.0,
96797.0, 62775.0, 149686.0, 288917.0, 56708.0, 125462.0, 155487.0, 147734.0,
143519.0, 67315.0, 36867.0, 49098.0, 44714.0, 238035.0, 182156.0, 214551.0,
104587.0, 233984.0, 65677.0, 240459.0, 77651.0, 211091.0, 127436.0, 144521.0,
216762.0, 171860.0, 51001.0, 107386.0, 200653.0, 153138.0, 105819.0, 131708.0,
204289.0, 205990.0, 204286.0, 211734.0, 74834.0, 51999.0, 89611.0, 108862.0,
262767.0, 117901.0, 140610.0, 61200.0, 103057.0, 141042.0, 70790.0, 65397.0,
171737.0, 74996.0, 72066.0, 130431.0, 219124.0, 144774.0, 47381.0, 52942.0,
148562.0, 208246.0, 47467.0, 183845.0, 70982.0, 37460.0, 74148.0, 148027.0,
122087.0, 181553.0, 91121.0, 53025.0, 236299.0, 188703.0, 144357.0, 128219.0,
40230.0, 107204.0, 270035.0, 59111.0, 125760.0, 108471.0, 51036.0, 83095.0,
134791.0, 64903.0, 148061.0, 168523.0, 37557.0, 213732.0, 71113.0, 75895.0,
119932.0, 88179.0, 39169.0, 114752.0, 231353.0, 201604.0, 141214.0, 41250.0,
220811.0, 207794.0, 37661.0, 64796.0, 211947.0, 184587.0, 123711.0, 37843.0,
179499.0, 49702.0, 121907.0, 195887.0, 145683.0, 121362.0, 271235.0, 169652.0,
36896.0, 296223.0, 61712.0, 208568.0, 151219.0, 55615.0, 71751.0, 207672.0,
44245.0, 248659.0, 104832.0, 73576.0, 234018.0, 135912.0, 64080.0, 141138.0,
110109.0, 41786.0, 205185.0, 153637.0, 207031.0, 243896.0, 57428.0, 194705.0,
143660.0, 105418.0, 211097.0, 262606.0, 203499.0, 140254.0, 43521.0, 120836.0,
192006.0, 89734.0, 122206.0, 168828.0, 297054.0, 65492.0, 52297.0, 159631.0,
80267.0, 114587.0, 277337.0, 71294.0, 129111.0, 47445.0, 44160.0, 214413.0,
114439.0, 201088.0, 86472.0, 74591.0, 94610.0, 35964.0, 67818.0, 182924.0,
56175.0, 48241.0, 212335.0, 147579.0, 186748.0, 114034.0, 221582.0, 83386.0,
42111.0, 140159.0, 236355.0, 149811.0, 148484.0, 294536.0, 154395.0, 121529.0,
56307.0, 52798.0, 140496.0, 50629.0, 126920.0, 77249.0, 48828.0, 40614.0,
201362.0, 204875.0, 65858.0, 286240.0, 151857.0, 157953.0, 125735.0, 56731.0,
177336.0, 57406.0, 142781.0, 60939.0, 226126.0, 157408.0, 223698.0, 74558.0,
139351.0, 64803.0, 147887.0, 108036.0, 129946.0, 212554.0, 67225.0, 207325.0,
210363.0, 160119.0, 202884.0, 268682.0, 79329.0, 56355.0, 54423.0, 47313.0,

279108.0, 118713.0, 215049.0, 92523.0, 143699.0, 126776.0, 69729.0, 128279.0,
136174.0, 44511.0, 189063.0, 181971.0, 185308.0, 74404.0, 181960.0, 98566.0,
218728.0, 169385.0, 224580.0, 135738.0, 174497.0, 64836.0, 219991.0, 96958.0,
152852.0, 140210.0, 190820.0, 138487.0, 40521.0, 56528.0, 147317.0, 149398.0,
144430.0, 146827.0, 240061.0, 146411.0, 116311.0, 120577.0, 110902.0, 201836.0,
193169.0, 221981.0, 105415.0, 150446.0, 97924.0, 160389.0, 80234.0, 53930.0,
190968.0, 105717.0, 102308.0, 141185.0, 238975.0, 125818.0, 71160.0, 131026.0,
45551.0, 134817.0, 76885.0, 94432.0, 239301.0, 206600.0, 268089.0, 110880.0,
73938.0, 108710.0, 46101.0, 119200.0, 44512.0, 58502.0, 39007.0, 208879.0,
153634.0, 59195.0, 35425.0, 74474.0, 66244.0, 38114.0, 182963.0, 72742.0,
142487.0, 95511.0, 192445.0, 298345.0, 142334.0, 195591.0, 44913.0, 100911.0,
137902.0, 92669.0, 168356.0, 45033.0, 51160.0, 238631.0, 92289.0, 129643.0,
246522.0, 132942.0, 53941.0, 137596.0, 40486.0, 37150.0, 142446.0, 228538.0,
253214.0, 238591.0, 205867.0, 202017.0, 185404.0, 131248.0, 61364.0, 55644.0,
39534.0, 124988.0, 91320.0, 214332.0, 151251.0, 72372.0, 74516.0, 39024.0,
194782.0, 254289.0, 85437.0, 109173.0, 207190.0, 242127.0, 206759.0, 63680.0,
44261.0, 194615.0, 38851.0, 39808.0, 84707.0, 288118.0, 231822.0, 103665.0,
105361.0, 45136.0, 37924.0, 50920.0, 125309.0, 60826.0, 167785.0, 59107.0,
227298.0, 164630.0, 87011.0, 130064.0, 146133.0, 200869.0, 65679.0, 171846.0,
48780.0, 36821.0, 234488.0, 123631.0, 70115.0, 127522.0, 37770.0, 140896.0,
211438.0, 74227.0, 110364.0, 149852.0, 201490.0, 50620.0, 37227.0, 112303.0,
88408.0, 232424.0, 53032.0, 145113.0, 191312.0, 65472.0, 188067.0, 181749.0,
43182.0, 49849.0, 73997.0, 115489.0, 71920.0, 60999.0, 59371.0, 126886.0,
267635.0, 280293.0, 164425.0, 74722.0, 220900.0, 103672.0, 189704.0, 124233.0,
206436.0, 143062.0, 189967.0, 270503.0, 60669.0, 67517.0, 139753.0, 126889.0,
113978.0, 49652.0, 121855.0, 160983.0, 238331.0, 133753.0, 162490.0, 77451.0,
114531.0, 229385.0, 52684.0, 168207.0, 141359.0, 184322.0, 205364.0, 112203.0,
96457.0, 237702.0, 246802.0, 35201.0, 92277.0, 193114.0, 83448.0, 112628.0,
128461.0, 119172.0, 213829.0, 72641.0, 104980.0, 241781.0, 142599.0, 57579.0,
193218.0, 284654.0, 41168.0, 154472.0, 182221.0, 126520.0, 72458.0, 112800.0,
228992.0, 107659.0, 135365.0, 145108.0, 65029.0, 168612.0, 151136.0, 84842.0,
219065.0, 257532.0, 72848.0, 55880.0, 246695.0, 182180.0, 119939.0, 117855.0,
80023.0, 164419.0, 182530.0, 131877.0, 42551.0, 214028.0, 94841.0, 96943.0,
205356.0, 35368.0, 222100.0, 88663.0, 271074.0, 116357.0, 76420.0, 145324.0,
213756.0, 156565.0, 276984.0, 64662.0, 62413.0, 83783.0, 185286.0, 265191.0,
113324.0, 73889.0, 43729.0, 273076.0, 139677.0, 223127.0, 117875.0, 209599.0,
42276.0, 43732.0, 60410.0, 230640.0, 164207.0, 90734.0, 295030.0, 182105.0,
179605.0, 139611.0, 90867.0, 64113.0, 195470.0, 208885.0, 258325.0, 69280.0,
67592.0, 256631.0, 226765.0, 70292.0, 65617.0, 107243.0, 177168.0, 154305.0,
54167.0, 74880.0, 284529.0, 171480.0, 147945.0, 208157.0, 278024.0, 164015.0,
137803.0, 90096.0, 133087.0, 142219.0, 106374.0, 121755.0, 120224.0, 146862.0,
53040.0, 77089.0, 117376.0, 96948.0, 156693.0, 140259.0, 138143.0, 118473.0,
72100.0, 116308.0, 215465.0, 167185.0, 109766.0, 114407.0, 35558.0, 70946.0,
74892.0, 217256.0, 70207.0, 136748.0, 219584.0, 266794.0, 217409.0, 152403.0,
71194.0, 197944.0, 47806.0, 124290.0, 115943.0, 73737.0, 164102.0, 38771.0,
126487.0, 58407.0, 107693.0, 162064.0, 98546.0, 103734.0, 102312.0, 223241.0,
89256.0, 52412.0, 74866.0, 151465.0, 132742.0, 73450.0, 285893.0, 85620.0,
239616.0, 240011.0, 180676.0, 49201.0, 152336.0, 164518.0, 192525.0, 151525.0,

54092.0, 72665.0, 83871.0, 263001.0, 112401.0, 122807.0, 36607.0, 39725.0,
50072.0, 136875.0, 44916.0, 145129.0, 151733.0, 163939.0, 63054.0, 180283.0,
195426.0, 70116.0, 64672.0, 136706.0, 169127.0, 216992.0, 297604.0, 163217.0,
165780.0, 113578.0, 294742.0, 85386.0, 155791.0, 47673.0, 202909.0, 269716.0,
134720.0, 123070.0, 40848.0, 66898.0, 127778.0, 49700.0, 219437.0, 140929.0,
124609.0, 270014.0, 97615.0, 155465.0, 143230.0, 109462.0, 49542.0, 177254.0,
63949.0, 129010.0, 105371.0, 145543.0, 113990.0, 258639.0, 80042.0, 119377.0,
229825.0, 72948.0, 110786.0, 117916.0, 202100.0, 126079.0, 125505.0, 185820.0,
171185.0, 45248.0, 57948.0, 241052.0, 236100.0, 246761.0, 53064.0, 205308.0,
154372.0, 73168.0, 202849.0, 102009.0, 178877.0, 243137.0, 50567.0, 155261.0,
35932.0, 74082.0, 193918.0, 179069.0, 72580.0, 212351.0, 148675.0, 143048.0,
91637.0, 237444.0, 247686.0, 55379.0, 181305.0, 77970.0, 62170.0, 163998.0,
147855.0, 182042.0, 85344.0, 155952.0, 149409.0, 219738.0, 127987.0, 159748.0,
276428.0, 247512.0, 191834.0, 58202.0, 56216.0, 52653.0, 49525.0, 104985.0,
297924.0, 75415.0, 41384.0, 90939.0, 65006.0, 185933.0, 138524.0, 76654.0,
57272.0, 214099.0, 145100.0, 57163.0, 117406.0, 162796.0, 57588.0, 234631.0,
79838.0, 142293.0, 63931.0, 152937.0, 137746.0, 209251.0, 135978.0, 155715.0,
60209.0, 130303.0, 174875.0, 210847.0, 191157.0, 200347.0, 274730.0, 39415.0,
74307.0, 150599.0, 290262.0, 54173.0, 39436.0, 197607.0, 236429.0, 87159.0,
175739.0, 189389.0, 272128.0, 147788.0, 147482.0, 35361.0, 101600.0, 75355.0,
133196.0, 197417.0, 223542.0, 184104.0, 203613.0, 177757.0, 65253.0, 41947.0,
141016.0, 74717.0, 49096.0, 292378.0, 233829.0, 172654.0, 96176.0, 175701.0,
100116.0, 107315.0, 66716.0, 51099.0, 262159.0, 192254.0, 217575.0, 191090.0,
101305.0, 76857.0, 134763.0, 224088.0, 202313.0, 37246.0, 93391.0, 282423.0,
145494.0, 129309.0, 186305.0, 140678.0, 190609.0, 135796.0, 117687.0, 150607.0,
54629.0, 44770.0, 155646.0, 85117.0, 147108.0, 129989.0, 61484.0, 142257.0,
152668.0, 207384.0, 105658.0, 42936.0, 92642.0, 110884.0, 94319.0, 36133.0,
267782.0, 207645.0, 77289.0, 256979.0, 50899.0, 128096.0, 150042.0, 65682.0,
46049.0, 257585.0, 199478.0, 219623.0, 149883.0, 215706.0, 214550.0, 40412.0,
269157.0, 45561.0, 134385.0, 66985.0, 46211.0, 276199.0, 79860.0, 114254.0,
149036.0, 187745.0, 84530.0, 199757.0, 191026.0, 85729.0, 90620.0, 205258.0,
183643.0, 202907.0, 131590.0, 231174.0, 61019.0, 37022.0, 109253.0, 175499.0,
136815.0, 174457.0, 229407.0, 244289.0, 136224.0, 176656.0, 164072.0, 138285.0,
66621.0, 144657.0, 200949.0, 43308.0, 136252.0, 199242.0, 124763.0, 137453.0,
241530.0, 195063.0, 114023.0, 107479.0, 46432.0, 110663.0, 37504.0, 116536.0,
134850.0, 39214.0, 83028.0, 155115.0, 37301.0, 153360.0, 88782.0, 156352.0,
218367.0, 220991.0, 199044.0, 141684.0, 119362.0, 146598.0, 53719.0, 141656.0,
56399.0, 62898.0, 67671.0, 178402.0, 72363.0, 148152.0, 94967.0, 194932.0,
48246.0, 75622.0, 155693.0, 126625.0, 66440.0, 140674.0, 244148.0, 168821.0,
166358.0, 139306.0, 162580.0, 70818.0, 72374.0, 68724.0, 224677.0, 51518.0,
236766.0, 213291.0, 204541.0, 214625.0, 298626.0, 150013.0, 181610.0, 209397.0,
74521.0, 161645.0, 109824.0, 160316.0, 140894.0, 110149.0, 89843.0, 53072.0,
63180.0, 278275.0, 260721.0, 185214.0, 46308.0, 144308.0, 172160.0, 253841.0,
127239.0, 282398.0, 61572.0, 136909.0, 99283.0, 62332.0, 113109.0, 146277.0,
107918.0, 54778.0, 181516.0, 202472.0, 57139.0, 208666.0, 118098.0, 275326.0,
271361.0, 201295.0, 207494.0, 205591.0, 47504.0, 127304.0, 83554.0, 41313.0,
291567.0, 134702.0, 196462.0, 148944.0, 84027.0, 109551.0, 85116.0, 111922.0,
51309.0, 267337.0, 121830.0, 143228.0, 202136.0, 44635.0, 273663.0, 79111.0,

156138.0, 67793.0, 145288.0, 114827.0, 71575.0, 131361.0, 164481.0, 156896.0,
143664.0, 38709.0, 140686.0, 129235.0, 72942.0, 146162.0, 178745.0, 201829.0,
158053.0, 52737.0, 112500.0, 74104.0, 47073.0, 221816.0, 38612.0, 60919.0,
41091.0, 74799.0, 91644.0, 103645.0, 116008.0, 294014.0, 92960.0, 123689.0,
41816.0, 184864.0, 158662.0, 151736.0, 63889.0, 132244.0, 199137.0, 58399.0,
281013.0, 144721.0, 84177.0, 41393.0, 213381.0, 111604.0, 207655.0, 174558.0,
66769.0, 126470.0, 198643.0, 51220.0, 134600.0, 128762.0, 37812.0, 112114.0,
198723.0, 114420.0, 104565.0, 148663.0, 61925.0, 203870.0, 121139.0, 104245.0,
174776.0, 38684.0, 84155.0, 206490.0, 209120.0, 68975.0, 60972.0, 75289.0,
130115.0, 107403.0, 175655.0, 36905.0, 71766.0, 159659.0, 291306.0, 78733.0,
63593.0, 127141.0, 74499.0, 231810.0, 121722.0, 246557.0, 104022.0, 197026.0,
42882.0, 270216.0, 292935.0, 60161.0, 165294.0, 229299.0, 142411.0, 54938.0,
277572.0, 167071.0, 120144.0, 53047.0, 280204.0, 141736.0, 136939.0, 66679.0,
254312.0, 61867.0, 39218.0, 248871.0, 165037.0, 65112.0, 43382.0, 230571.0,
127146.0, 202126.0, 139286.0, 111753.0, 209122.0, 103367.0, 253753.0, 49738.0,
200971.0, 231725.0, 62425.0, 85900.0, 209507.0, 97331.0, 71221.0, 213475.0,
138108.0, 64400.0, 184235.0, 58257.0, 145408.0, 44255.0, 71819.0, 72862.0,
295834.0, 57544.0, 141792.0, 271996.0, 196426.0, 133020.0, 138355.0, 63560.0,
62662.0, 158277.0, 52217.0, 117058.0, 194217.0, 127173.0, 62913.0, 209949.0,
42403.0, 64689.0, 220652.0, 148444.0, 105534.0, 37445.0, 68699.0, 111247.0,
124888.0, 118332.0, 234714.0, 40686.0, 159596.0, 215489.0, 202438.0, 129328.0,
42214.0, 69217.0, 37120.0, 83347.0, 208983.0, 120611.0, 207911.0, 42868.0,
70262.0, 283687.0, 139166.0, 104728.0, 224693.0, 167625.0, 145037.0, 220359.0,
249883.0, 141573.0, 132939.0, 172152.0, 221061.0, 99654.0, 146861.0, 120329.0,
146968.0, 187238.0, 157704.0, 68474.0, 230292.0, 85372.0, 114164.0, 193054.0,
210023.0, 207949.0, 164440.0, 193245.0, 56775.0, 100655.0, 245700.0, 177623.0,
59660.0, 275239.0, 68959.0, 163550.0, 181456.0, 83553.0, 95757.0, 168525.0,
247739.0, 113221.0, 62924.0, 258279.0, 155072.0, 66133.0, 71391.0, 131541.0,
167095.0, 208166.0, 159241.0, 75901.0, 195893.0, 80578.0, 217389.0, 241683.0,
106906.0, 172961.0, 38884.0, 71733.0, 215176.0, 62708.0, 122385.0, 223061.0,
35240.0, 72355.0, 174350.0, 283735.0, 243397.0, 109989.0, 179901.0, 64236.0,
119440.0, 71135.0, 117637.0, 110468.0, 192163.0, 180317.0, 81016.0, 254132.0,
50223.0, 174918.0, 56141.0, 153440.0, 80185.0, 57669.0, 147430.0, 190389.0,
63766.0, 231007.0, 158830.0, 129466.0, 61292.0, 115438.0, 116825.0, 128813.0,
74638.0, 38281.0, 66891.0, 270878.0, 189363.0, 64165.0, 176942.0, 54035.0,
110540.0, 142045.0, 165484.0, 53485.0, 37170.0, 130695.0, 153349.0, 124266.0,
164648.0, 134399.0, 144038.0, 138939.0, 229950.0, 176469.0, 161826.0, 154008.0,
219364.0, 52664.0, 274632.0, 125732.0, 107500.0, 105525.0, 56155.0, 115648.0,
147270.0, 55926.0, 155151.0, 47697.0, 47602.0, 143250.0, 194069.0, 62290.0,
135941.0, 243500.0, 124553.0, 55765.0, 58983.0, 127846.0, 135417.0, 203700.0,
177855.0, 128520.0, 203736.0, 149321.0, 93961.0, 180563.0, 91601.0, 113848.0,
217480.0, 71883.0, 148254.0, 73217.0, 55432.0, 147533.0, 47631.0, 43926.0,
53405.0, 72019.0, 172507.0, 70731.0, 64717.0, 73654.0, 141088.0, 144295.0,
144191.0, 148593.0, 112411.0, 99404.0, 183033.0, 44386.0, 295061.0, 40605.0,
171354.0, 161058.0, 289479.0, 218156.0, 183743.0, 209092.0, 169021.0, 37334.0,
66723.0, 179174.0, 119396.0, 158801.0, 96657.0, 256074.0, 173646.0, 102925.0,
96521.0, 124498.0, 219607.0, 50859.0, 50201.0, 137137.0, 68120.0, 217313.0,
97506.0, 166817.0, 138906.0, 215979.0, 139474.0, 63307.0, 145232.0, 124271.0,

212215.0, 96098.0, 262538.0, 235558.0, 134599.0, 261863.0, 192175.0, 123526.0, 111500.0, 242126.0, 147245.0, 40786.0, 110600.0, 188682.0, 133983.0, 55312.0, 143061.0, 166372.0, 192196.0, 135013.0, 65424.0, 85485.0, 138014.0, 114376.0, 139678.0, 155022.0, 288979.0, 125103.0, 251023.0, 296480.0, 115354.0, 102748.0, 224871.0, 116619.0, 47461.0, 74726.0, 95498.0, 146023.0, 271208.0, 42349.0, 174215.0, 224416.0, 282712.0, 80664.0, 59214.0, 137879.0, 256958.0, 149343.0, 141102.0, 163878.0, 142489.0, 234074.0, 160734.0, 174876.0, 290163.0, 48390.0, 41055.0, 126902.0, 114667.0, 243976.0, 205180.0, 207215.0, 232179.0, 53788.0, 91796.0, 56118.0, 142190.0, 181380.0, 46994.0, 67141.0, 266041.0, 36723.0, 267684.0, 213864.0, 67150.0, 40702.0, 181849.0, 58155.0, 139859.0, 126687.0, 297250.0, 123306.0, 78605.0, 193660.0, 166603.0, 103049.0, 135489.0, 75285.0, 211871.0, 100346.0, 94594.0, 121047.0, 155457.0, 142265.0, 183867.0, 37085.0, 180324.0, 63760.0, 61295.0, 70175.0, 84219.0, 47963.0, 119057.0, 202993.0, 52206.0, 133615.0, 117062.0, 139633.0, 175579.0, 213686.0, 107706.0, 211863.0, 143508.0, 74290.0, 182259.0, 156358.0, 155106.0, 153226.0, 175457.0, 53157.0, 120231.0, 73810.0, 286138.0, 64733.0, 64488.0, 149788.0, 137054.0, 113030.0, 171802.0, 84951.0, 192086.0, 38264.0, 98618.0, 36287.0, 42374.0, 47419.0, 245991.0, 54905.0, 81356.0, 118160.0, 222833.0, 281521.0, 189610.0, 44361.0, 103084.0, 227411.0, 109819.0, 62686.0, 130588.0, 39373.0, 40475.0, 286676.0, 260347.0, 93247.0, 149066.0, 207328.0, 82755.0, 199463.0, 217163.0, 79465.0, 40313.0, 208578.0, 144725.0, 85993.0, 74177.0, 122104.0, 147912.0, 177652.0, 61762.0, 265023.0, 71301.0, 131344.0, 51448.0, 142916.0, 270845.0, 277566.0, 219258.0, 110975.0, 119284.0, 121102.0, 64790.0, 82291.0, 130861.0, 165993.0, 130096.0, 59594.0, 152580.0, 149808.0, 149290.0, 123678.0, 97332.0, 256536.0, 141762.0, 44166.0, 295943.0, 242171.0, 73405.0, 132474.0, 105230.0, 174193.0, 99230.0, 198786.0, 103136.0, 205107.0, 289138.0, 209074.0, 285219.0, 200787.0, 50164.0, 80719.0, 115781.0, 74414.0, 38291.0, 167192.0, 263637.0, 232263.0, 261724.0, 158531.0, 52754.0, 216949.0, 149591.0, 45258.0, 117645.0, 129617.0, 40699.0, 105389.0, 37670.0, 59108.0, 122343.0, 67262.0, 162683.0, 54171.0, 161281.0, 142949.0, 78320.0, 195702.0, 232764.0, 252092.0, 139624.0, 116226.0, 74721.0, 186383.0, 212649.0, 44740.0, 80246.0, 178512.0, 166806.0, 69855.0, 123481.0, 173897.0, 71345.0, 187108.0, 127594.0, 150728.0, 153429.0, 209710.0, 152109.0, 298978.0, 200415.0, 73649.0, 119573.0, 218313.0, 58557.0, 259804.0, 205064.0, 201510.0, 226716.0, 38019.0, 60167.0, 87845.0, 291392.0, 130616.0, 72435.0, 65595.0, 50777.0, 64797.0, 243399.0, 70861.0, 196472.0, 254824.0, 90103.0, 115066.0, 55319.0, 191846.0, 68783.0, 109398.0, 134251.0, 43066.0, 136188.0, 37671.0, 222018.0, 44167.0, 126639.0, 72185.0, 205549.0, 71932.0, 256196.0, 253221.0, 72965.0, 68623.0, 39202.0, 217125.0, 208159.0, 43927.0, 98807.0, 72810.0, 171567.0, 71830.0, 59858.0, 149714.0, 192158.0, 39114.0, 179253.0, 171969.0, 192975.0, 211007.0, 43580.0, 124313.0, 103630.0, 141828.0, 118544.0, 214161.0, 142074.0, 72282.0, 36920.0, 54337.0, 42426.0, 167677.0, 121195.0, 205817.0, 201125.0, 215285.0, 73741.0, 190839.0, 192226.0, 72438.0, 69370.0, 141264.0, 145744.0, 177661.0, 128788.0, 63015.0, 60868.0, 66948.0, 58261.0]
Cardholder_Average_Spend: [36369.65, 89179.12, 106668.6, 173155.52, 52713.09, 80393.44, 84215.74, 45671.98, 29653.72, 22530.16, 59005.49, 114795.35, 37604.47, 55435.8, 32709.92, 91645.94, 17095.23, 43600.78, 25541.32, 15010.84, 119433.17, 26684.14, 174459.39, 40237.57, 27362.31, 34856.0, 43816.13, 40468.63,

nan, 149542.17, 52722.29, 52810.01, 13681.1, 51803.38, 77139.6, 24985.96, 85765.51, 91993.39, 41311.31, 103955.84, 129105.54, 21367.47, 159364.5, 66200.54, 20325.7, 83711.76, 68810.0, 34399.41, 145755.09, 29666.79, 52759.44, 54165.3, 16215.11, 18879.64, 70013.3, 66086.12, 69329.13, 101475.72, 57246.72, 39993.74, 37545.89, 85113.39, 81029.51, 91218.7, 28845.04, 59785.2, 89673.77, 15497.48, 45427.54, 22859.01, 46653.12, 21184.07, 29991.45, 31594.7, 59592.68, 77795.12, 90685.83, 42509.38, 72954.33, 91121.26, 37893.76, 84102.68, 126920.17, 13087.41, 43176.0, 41305.85, 23402.86, 40886.03, 131297.22, 87887.24, 141330.54, 125742.35, 44640.87, 36476.87, 39776.33, 14092.56, 15376.4, 62669.78, 42253.46, 39630.98, 176814.28, 62680.18, 43397.37, 21371.49, 111888.99, 24397.69, 50854.07, 140209.05, 133224.15, 113133.57, 40595.87, 120160.55, 53881.56, 190272.55, 69693.11, 111816.59, 52170.74, 24807.53, 41245.44, 197053.39, 60892.67, 48085.55, 37610.51, 180842.52, 41774.86, 32431.87, 41836.78, 54921.2, 193419.45, 25628.9, 55355.32, 61334.67, 61695.18, 31797.86, 20718.64, 74764.0, 117196.21, 24635.49, 35909.99, 21342.72, 33616.93, 74601.17, 143980.56, 51352.91, 33035.64, 48162.26, 65814.18, 170282.15, 35906.22, 114100.15, 131307.66, 27732.43, 28675.21, 125441.18, 30671.16, 104904.82, 48816.28, 98775.92, 16547.66, 26611.74, 42197.26, 22369.5, 73907.22, 54833.88, 113343.66, 105433.83, 21533.3, 158781.55, 80265.64, 142675.34, 54191.79, 135923.07, 16717.09, 102577.88, 29492.17, 56278.33, 32435.07, 103473.32, 54763.3, 21968.03, 44470.42, 47713.86, 108252.41, 110604.19, 38210.49, 61293.17, 84778.38, 47181.67, 42381.48, 44918.85, 115221.26, 39104.82, 95907.78, 64016.1, 42806.16, 115423.6, 31210.26, 27179.69, 106688.06, 31944.06, 140885.42, 58739.75, 155313.86, 48430.84, 23136.0, 11670.96, 43898.6, 40567.73, 69379.73, 146080.92, 39597.17, 86912.31, 29794.77, 69384.61, 24269.07, 54025.63, 43571.63, 43737.19, 49669.13, 47709.27, 53837.0, 93680.97, 24312.25, 53108.36, 32386.11, 21042.67, 34994.07, 45242.66, 19590.22, 128007.69, 82832.24, 43423.61, 43968.76, 18135.68, 60346.32, 34443.41, 90843.81, 141363.17, 72165.41, 68701.99, 51243.88, 163193.61, 93502.23, 35274.69, 133224.26, 120318.36, 48358.77, 65794.91, 15216.47, 23601.0, 27128.03, 57832.68, 35162.9, 38819.4, 101159.33, 69162.97, 75904.68, 143235.65, 98170.12, 38977.0, 91017.73, 111800.02, 73276.27, 77980.44, 82515.67, 75141.83, 49025.2, 37282.56, 149845.0, 30868.43, 73114.66, 41160.77, 52195.06, 39932.12, 75041.22, 63223.61, 47895.44, 42041.38, 34627.89, 42468.83, 75107.24, 59387.78, 46715.89, 14709.36, 23885.16, 36860.97, 16249.73, 99605.76, 36397.72, 45056.19, 86855.55, 50069.58, 15556.69, 48732.75, 90479.39, 40243.39, 24661.86, 43414.99, 47826.05, 77806.71, 26361.69, 39814.31, 49980.59, 80293.29, 40696.31, 14957.69, 36717.09, 48451.62, 90125.85, 40901.43, 154913.94, 45407.69, 26976.4, 22426.51, 17281.64, 39531.32, 68186.81, 111008.59, 51885.56, 37467.59, 14882.56, 71413.06, 91601.08, 24024.52, 35303.17, 31048.77, 174066.07, 21930.21, 30869.01, 66055.57, 108365.39, 17646.99, 60447.23, 60247.91, 34818.15, 63020.18, 65750.0, 32554.72, 179238.85, 28527.52, 15856.79, 43590.56, 74758.97, 48990.16, 36893.84, 130951.1, 34566.78, 118995.97, 132253.85, 49620.34, 36142.19, 65748.0, 112590.26, 58933.6, 93119.86, 20451.71, 43567.1, 74566.78, 47300.53, 24300.46, 194186.6, 172275.57, 62815.91, 49267.92, 54478.46, 24605.92, 84608.39, 28315.62, 24631.0, 59673.38, 63278.62, 37240.29, 55824.47, 34081.74, 136009.87, 36265.41, 48861.37, 81808.52, 86110.75, 64246.7, 165228.21, 60658.44, 45467.73, 111806.98, 68345.37, 20519.1, 88305.94, 48268.78, 90164.87, 97870.4, 51615.57, 105768.78, 45241.11, 134008.17, 13500.35, 114198.41, 62728.38, 32322.42, 72682.96,

68730.46, 16993.18, 57798.2, 91664.01, 111421.39, 59980.14, 19929.5, 119537.74,
63656.72, 21832.24, 56473.33, 53192.03, 51389.94, 66377.15, 93617.67, 104669.24,
36254.8, 29848.01, 122202.13, 26012.86, 106318.65, 43634.11, 37461.0, 45576.83,
115927.24, 48636.21, 42013.25, 32920.16, 40366.54, 64317.41, 56477.92,
186540.86, 44125.55, 37712.71, 31151.06, 39526.27, 21837.15, 54841.47,
111643.92, 60434.06, 32948.06, 131774.89, 113105.88, 55509.28, 109268.38,
59517.1, 67573.85, 74471.1, 37804.29, 21652.95, 103553.3, 108095.93, 79354.81,
139849.93, 41467.91, 67351.62, 21533.45, 38179.76, 37276.96, 63473.26, 79277.19,
37710.94, 91353.64, 80896.63, 22081.16, 63581.4, 66680.69, 57608.4, 69479.39,
22009.95, 80696.86, 21594.68, 40684.48, 126985.93, 24452.37, 24646.72, 52474.84,
30349.58, 19778.71, 37146.18, 82026.1, 59873.7, 67755.14, 62000.18, 23438.91,
53394.14, 114323.25, 110847.6, 22870.6, 40494.76, 93928.81, 94095.81, 70970.35,
54162.98, 41485.63, 31759.76, 110436.99, 75449.28, 178742.27, 118870.43,
43556.12, 30694.81, 140856.66, 68393.06, 24839.05, 41390.45, 103400.63,
176048.37, 135631.63, 45580.73, 71362.41, 32982.34, 38213.32, 97112.18, 80603.8,
46743.37, 83592.38, 108765.48, 146868.12, 63941.29, 55266.84, 34023.38,
79028.97, 78905.0, 38551.26, 32514.28, 22749.83, 27707.5, 46767.98, 35826.81,
119054.08, 151032.34, 61812.11, 74321.8, 33739.28, 26702.13, 37398.81, 29316.49,
19751.49, 61890.59, 16196.45, 79604.84, 52578.52, 33619.11, 52107.94, 60828.88,
68323.47, 67704.26, 37905.85, 123903.89, 28441.65, 124188.67, 43392.0,
120413.91, 81576.95, 30641.67, 98066.06, 46577.19, 42590.48, 32442.53, 48708.2,
82294.56, 27994.27, 52962.35, 84461.53, 17832.79, 98787.09, 40380.88, 16301.12,
41355.87, 49854.87, 20542.75, 25097.49, 57373.23, 123832.97, 33418.57, 33448.01,
59364.56, 149078.0, 30395.29, 39474.95, 110125.25, 77662.77, 47909.9, 148714.51,
36173.0, 101059.13, 36689.45, 37044.22, 38325.21, 37696.72, 114127.93, 64104.85,
41096.02, 21570.79, 37491.42, 37538.58, 71592.19, 76098.64, 82547.9, 53968.69,
46820.72, 26018.91, 37737.61, 63629.18, 34142.68, 68947.41, 27286.74, 32203.41,
17638.01, 92764.75, 71175.82, 166900.19, 70827.38, 37403.93, 47286.32,
112096.57, 33821.11, 81275.41, 14155.84, 73291.88, 54315.27, 35917.66, 37364.49,
105769.58, 102791.57, 23658.66, 97493.35, 46548.76, 38130.94, 44710.61,
54609.23, 159052.65, 35109.44, 91281.44, 89083.5, 54455.89, 16278.09, 62461.44,
29493.26, 62007.36, 29314.31, 80598.26, 52163.61, 34785.59, 20925.5, 98780.25,
41247.05, 111772.69, 145673.38, 43549.53, 26730.41, 79535.36, 73121.62,
56632.69, 37314.74, 53566.67, 50968.94, 30317.9, 81956.5, 93486.12, 10491.06,
98187.7, 16312.15, 90845.21, 35028.75, 25401.68, 102869.27, 30343.12, 33208.18,
71995.04, 74270.43, 66405.36, 22734.24, 39637.06, 78738.88, 27656.59, 45964.55,
152184.64, 44646.26, 59489.0, 41472.56, 103514.26, 96525.73, 194616.78,
60361.67, 103779.94, 35875.09, 89460.43, 38237.52, 53188.78, 92447.46, 22688.35,
34852.58, 15333.72, 27206.84, 38924.95, 32670.43, 27198.27, 69315.78, 67589.14,
21383.81, 22810.32, 108898.78, 74512.49, 93803.68, 12320.11, 88928.82, 28027.54,
128982.79, 65930.08, 37552.08, 49910.03, 28154.13, 26658.77, 45483.82, 41180.46,
35506.52, 112022.57, 23276.93, 69288.38, 33557.13, 37463.18, 55649.89, 65088.16,
36489.03, 15291.91, 25679.2, 38518.08, 80814.01, 51996.93, 88038.19, 120111.59,
21642.16, 37791.64, 31971.31, 95121.88, 38650.39, 115787.21, 35498.44, 33242.91,
35510.21, 84685.71, 15872.41, 20371.06, 45530.96, 40285.99, 24156.55, 69022.99,
47361.36, 48656.13, 33929.09, 88451.77, 30990.12, 122572.79, 43024.0, 49237.43,
147161.11, 23975.25, 120316.29, 42918.25, 18615.54, 75734.51, 39421.03, 17977.5,
120685.3, 34107.03, 95027.64, 77386.25, 48067.78, 38894.53, 35480.05, 136531.61,

20528.6, 97050.27, 86960.1, 46629.88, 17997.2, 41771.56, 57115.98, 26843.0,
37661.16, 40231.26, 45844.38, 50178.42, 62446.63, 36709.88, 100315.47, 93840.37,
198734.51, 105343.93, 119010.28, 94978.05, 163379.13, 196746.78, 63078.06,
23364.36, 45683.86, 28064.8, 153330.47, 21707.01, 75948.99, 74659.37, 27565.2,
35573.02, 178455.31, 60124.8, 109002.18, 30006.43, 59689.18, 35497.93, 42811.02,
81815.33, 41499.54, 36026.13, 68625.59, 29576.04, 48699.57, 80330.4, 31196.55,
21082.98, 56655.53, 29065.09, 54514.36, 38156.54, 131086.08, 177851.96, 65336.8,
74106.67, 84290.15, 30372.54, 21778.85, 55000.3, 90464.34, 20804.43, 101503.13,
49996.78, 47243.78, 35860.44, 70487.66, 49252.32, 81952.46, 37623.73, 32098.57,
59573.95, 88633.65, 173653.11, 23686.79, 176808.39, 37544.04, 64887.49,
60241.72, 52586.85, 14980.5, 29691.66, 80695.14, 82654.59, 180395.75, 28128.76,
26553.84, 67869.9, 43390.73, 27379.65, 16699.76, 41022.14, 32075.45, 41788.43,
20263.07, 170566.74, 59038.47, 84877.19, 32872.81, 20320.14, 80764.82, 48713.97,
43396.0, 23680.79, 33619.77, 35916.13, 36888.52, 28176.23, 32764.33, 20681.09,
28537.52, 114208.99, 63556.5, 38832.03, 41461.92, 17126.67, 26921.8, 117594.3,
19540.58, 104328.64, 91353.25, 15360.63, 42164.25, 166658.96, 31202.29,
53988.35, 70239.74, 29557.4, 64785.76, 27188.15, 153791.82, 114685.98, 37817.19,
20796.56, 78479.54, 125586.01, 45467.83, 36024.14, 18330.35, 120114.09,
195793.23, 43928.61, 100252.91, 142997.99, 49616.24, 54657.1, 30995.43,
44638.26, 44717.74, 33987.76, 20650.23, 39870.21, 58587.22, 12506.51, 26776.86,
176823.99, 69646.41, 142156.77, 192106.34, 70264.38, 20549.57, 64176.35,
32227.23, 99292.61, 15793.41, 122019.15, 61221.07, 70580.22, 40263.16, 45502.98,
53040.55, 36280.28, 52818.23, 51117.23, 60533.78, 48026.06, 52588.11, 49548.65,
168070.31, 16229.33, 16584.09, 58089.34, 21618.6, 36252.8, 29073.29, 79411.29,
42177.98, 38411.48, 49859.42, 40129.23, 53155.1, 43987.53, 42177.48, 26514.58,
146367.26, 50518.57, 88151.43, 49809.79, 70900.94, 45181.06, 42266.66, 79136.89,
114168.81, 66115.72, 29676.83, 33226.77, 138777.96, 144596.13, 68825.8,
51542.93, 80515.64, 39343.09, 56815.52, 20529.35, 162190.71, 23958.92, 79481.84,
129734.74, 45692.06, 39574.84, 17865.66, 171206.66, 53694.95, 60490.13,
36886.83, 141769.53, 21612.16, 80075.76, 71023.34, 55365.3, 79682.71, 26098.65,
94130.07, 70559.18, 16301.55, 63381.26, 32363.88, 48645.55, 72075.98, 54344.21,
78600.24, 34679.63, 57656.49, 153799.39, 26400.93, 42669.45, 37457.31, 99997.74,
57302.93, 55300.06, 41998.45, 51837.18, 37622.63, 35309.9, 63051.68, 140802.41,
28430.3, 100004.16, 33483.39, 41964.5, 37069.69, 52154.93, 36985.29, 67827.56,
29397.98, 25192.44, 85279.5, 65841.66, 38825.18, 20564.37, 70230.6, 45535.09,
66977.93, 42595.29, 92023.49, 145141.32, 112420.69, 76490.87, 99953.42,
37334.79, 44208.05, 34048.07, 57393.46, 94720.66, 47981.05, 139626.37, 99437.05,
33207.48, 71356.37, 20222.79, 55017.67, 26865.28, 26628.53, 140449.34, 51199.13,
37098.08, 33973.05, 40166.36, 74567.78, 59695.48, 46695.61, 38145.05, 34278.6,
57571.7, 29172.63, 49223.89, 35899.01, 33049.09, 82832.19, 44873.93, 83921.92,
20281.1, 44268.4, 88478.08, 33345.84, 82307.68, 156233.88, 30424.38, 22963.08,
89241.07, 35359.43, 114624.17, 123906.44, 31144.75, 95099.56, 67914.2, 99592.57,
25903.15, 63275.96, 92476.47, 37954.05, 21808.33, 73374.8, 35283.96, 39732.04,
32610.99, 42859.5, 59163.26, 64126.85, 109095.72, 50778.09, 55480.7, 47438.78,
21776.21, 132747.66, 38831.61, 109874.44, 35442.04, 197335.35, 189415.4,
64337.86, 56689.99, 62671.48, 53006.26, 80754.93, 75159.98, 13302.94, 106055.25,
170443.43, 47749.07, 22962.1, 84643.56, 64696.53, 48929.77, 88272.01, 96539.28,
39235.16, 52541.95, 26297.24, 123029.5, 71592.84, 105717.8, 43181.13, 143840.49,

135926.21, 20657.28, 66615.23, 109117.37, 46500.97, 97895.72, 66393.36, 143683.64, 109113.96, 21863.08, 104040.31, 68839.25, 145410.08, 24539.7, 25322.48, 32306.07, 26084.06, 53757.54, 42013.34, 77732.59, 93326.77, 18768.29, 36714.94, 43448.94, 44319.9, 39815.6, 26721.12, 73167.82, 45260.08, 38707.65, 36337.96, 23004.17, 15459.68, 10957.71, 47033.77, 44884.0, 50247.78, 80984.7, 25950.92, 13800.44, 37618.85, 137245.08, 46071.87, 37109.15, 24953.97, 43359.52, 24204.75, 23807.22, 17566.81, 34348.52, 36597.46, 33651.48, 24323.44, 42719.0, 40922.14, 104643.88, 70704.68, 27606.06, 34543.52, 186602.19, 47467.65, 23369.91, 40179.56, 74518.11, 30411.59, 13695.49, 34383.53, 24089.67, 18809.78, 85843.5, 44127.98, 25980.9, 27726.21, 37055.26, 179503.76, 28756.35, 44999.7, 33862.51, 40574.05, 71176.11, 71500.35, 80249.17, 184947.47, 165094.38, 74672.83, 30862.47, 153886.32, 74068.38, 53739.07, 48041.93, 171705.71, 88844.33, 135082.92, 53203.35, 30247.69, 121366.9, 36795.34, 95233.49, 140162.83, 21652.49, 69377.9, 44314.86, 130298.43, 26514.76, 41292.21, 58319.19, 45839.97, 40440.29, 36637.47, 16515.37, 35862.7, 129358.72, 146708.8, 133545.35, 48034.45, 69677.78, 24187.95, 39669.75, 58723.59, 38029.59, 48676.42, 52156.23, 124499.69, 14416.53, 28724.99, 35644.06, 77813.58, 53855.42, 33396.87, 19962.66, 106681.39, 37439.35, 94328.11, 116008.08, 52384.64, 23447.93, 149107.28, 58643.19, 135550.01, 78983.04, 56539.97, 44132.95, 47762.63, 42644.24, 31735.43, 63607.37, 46288.52, 88285.73, 18987.38, 65185.82, 42497.86, 45311.73, 115241.99, 37527.23, 20391.79, 44885.86, 23968.23, 51868.9, 54949.44, 39278.45, 85701.38, 29082.95, 46354.62, 36358.64, 78536.68, 68768.08, 121433.94, 31103.53, 98352.41, 27509.03, 116272.46, 19409.23, 46079.3, 80989.12, 48088.3, 101835.36, 84661.64, 151208.92, 53697.45, 14047.87, 29395.96, 20317.25, 58885.09, 37283.93, 15548.36, 128394.12, 85816.78, 27980.94, 41519.72, 21347.9, 57167.57, 30963.91, 13019.17, 114468.22, 47668.48, 57549.97, 91405.47, 185603.39, 75673.97, 60161.98, 70136.37, 21225.42, 19851.13, 45291.43, 39365.47, 54854.43, 27230.22, 25698.28, 72490.88, 135552.5, 21247.59, 87082.49, 103478.78, 57007.53, 77422.63, 33698.89, 57482.2, 97451.87, 44812.29, 26567.7, 41613.57, 72154.3, 44936.91, 140826.66, 79371.78, 114198.81, 83455.28, 52719.83, 27053.48, 32400.4, 20086.69, 66646.41, 46352.7, 29583.27, 88997.11, 94932.7, 141412.69, 24086.5, 27848.7, 43081.18, 11716.05, 28785.68, 56159.42, 143989.12, 27679.54, 17067.9, 46056.87, 11583.63, 48090.07, 59676.22, 30185.97, 56329.56, 50331.9, 67597.0, 39956.54, 75037.95, 29531.16, 121884.8, 24304.35, 36693.34, 33729.77, 21357.02, 177082.8, 64993.72, 82426.99, 124437.36, 26063.54, 46022.66, 121466.42, 21314.75, 98451.66, 46475.59, 82968.64, 32152.96, 81911.52, 20131.38, 89110.34, 25594.28, 119631.08, 20472.22, 49139.97, 23623.66, 26605.91, 24350.31, 71823.73, 55617.09, 56081.98, 61064.57, 138889.52, 66338.34, 32361.78, 43229.61, 145720.85, 41525.67, 99766.88, 116843.41, 80257.93, 36732.84, 31629.53, 55981.85, 167003.95, 172661.08, 92197.65, 36816.11, 37546.41, 71899.12, 19995.31, 61785.71, 53168.83, 134289.83, 29571.14, 27220.07, 197776.95, 25562.37, 23244.14, 20650.9, 63135.96, 39282.91, 30926.91, 37251.26, 135141.77, 11622.12, 49630.42, 41104.03, 25206.38, 35346.97, 56474.03, 123923.17, 147573.62, 28534.73, 29987.19, 32808.85, 107937.14, 26701.13, 180509.22, 33887.45, 87105.14, 90232.92, 126087.77, 79575.89, 179168.45, 133899.2, 129663.11, 35938.85, 34189.93, 121980.1, 93955.07, 72316.24, 74340.56, 134341.17, 29741.05, 109991.55, 26432.12, 50850.49, 26381.5, 47163.38, 67759.79, 20539.67, 40248.42, 162154.7, 45212.99, 74472.69, 25073.0, 181228.71, 54743.64, 79481.06, 19347.93, 104890.17, 19248.07, 26155.08, 193910.21, 69848.16, 41480.54, 130214.71, 46112.63, 16595.51, 89819.47, 16529.61, 26784.26, 31295.86, 89420.31, 14297.41, 41036.71, 80462.22, 84598.35, 54642.19, 41143.39, 42259.66, 42913.72, 54758.89, 147451.97, 20790.92, 30911.21, 23965.97, 55852.55, 22688.54, 22882.8, 37832.49, 16694.33, 50088.24, 59246.11, 33861.11, 40854.45, 25351.09, 66095.04, 32376.07, 28235.27, 137288.17, 14840.16, 90790.2, 141519.42, 73259.41, 41750.69, 69555.01, 189521.32, 89142.06, 95647.32, 53657.11, 21277.02, 117200.07, 148907.86, 91648.97, 144021.59, 75211.71, 97877.67, 75075.41, 71899.41, 27777.44, 148816.66, 31608.26, 80722.13, 23673.61, 79998.62, 27442.37, 32545.51, 77974.9, 18501.1, 70285.33, 68413.76, 39024.41, 141418.24, 67072.67, 45170.97, 26119.66, 46224.17, 24926.43, 103747.92, 29476.72, 27745.12, 84014.07, 36604.18, 97805.04, 19593.89, 156689.54, 79775.58, 86222.7, 45367.17, 33858.1, 88256.92, 48865.18, 43830.66, 47317.72, 101180.51, 46194.24, 130272.74, 19547.42, 69656.87, 29669.78, 74833.55, 20716.74, 26395.42, 46489.53, 40606.67, 84729.39, 16168.87, 81477.12, 21695.92, 180188.73, 35275.89, 115689.25, 17201.86, 131912.55, 44214.84, 155383.59, 27545.91, 103570.15, 88009.48, 27884.24, 16270.13, 82257.12, 26169.33, 30524.82, 47610.2, 112151.27, 27167.39, 58463.0, 108391.99, 54527.41, 87114.79, 42761.4, 27201.55, 98560.06, 39867.97, 117299.1, 35221.68, 31924.39, 71900.53, 23190.63, 51632.72, 120457.16, 71726.82, 19685.29, 60390.53, 18163.62, 122737.57, 101092.7, 54548.66, 79629.8, 75060.98, 127524.31, 38622.31, 18072.52, 30469.63, 59110.21, 17706.04, 42177.81, 92458.54, 25559.19, 72443.52, 70964.0, 20917.81, 75017.6, 29337.88, 29841.47, 31436.68, 144174.42, 146075.42, 75360.22, 82169.89, 82230.26, 33038.48, 85696.52, 36924.45, 35637.87, 131678.49, 96906.95, 34581.62, 27431.32, 38143.7, 80731.88, 84350.09, 30514.42, 77175.46, 18462.53, 87009.7, 118382.84, 86729.8, 14408.06, 47813.05, 37070.64, 125595.76, 44116.6, 44265.95, 103306.56, 60728.44, 149691.63, 90405.86, 34009.68, 35949.5, 78472.95, 26967.34, 100142.16, 20616.94, 58885.13, 81547.57, 23635.03, 115858.36, 72518.39, 47232.45, 52390.42, 87747.35, 131904.34, 43728.04, 141237.59, 64624.59, 41458.29, 24694.98, 39562.26, 87272.64, 16780.09, 106840.49, 158535.29, 60026.41, 167171.41, 148332.32, 146837.0, 79636.71, 67701.93, 37348.55, 32258.04, 127835.61, 16385.99, 45384.19, 39055.99, 86780.66, 46457.34, 41223.12, 125151.42, 37122.09, 73270.16, 35575.1, 109116.63, 80146.18, 43649.08, 56947.06, 38706.62, 122092.86, 47460.32, 59007.92, 79355.99, 60149.84, 77569.51, 12368.78, 68222.95, 54666.19, 78422.2, 122800.48, 38949.88, 37936.44, 136302.6, 25258.83, 136897.12, 47188.9, 43124.43, 37507.25, 26225.6, 18135.15, 23103.8, 78989.26, 94699.28, 21900.01, 49687.0, 149080.83, 106843.44, 64231.6, 40283.01, 152288.5, 103771.39, 67350.4, 37233.35, 74907.83, 36144.11, 46449.53, 18374.99, 64148.55, 58578.61, 33224.24, 37899.35, 44468.04, 24607.39, 118744.57, 118412.1, 163848.39, 47060.93, 41779.15, 65386.35, 52352.44, 57139.81, 33566.78, 100297.78, 56976.34, 11525.5, 58405.96, 41108.98, 90175.6, 63293.24, 28133.66, 86519.06, 57567.59, 52586.25, 48895.12, 26334.7, 49775.6, 133878.82, 24421.68, 16557.79, 33515.85, 123497.47, 193927.27, 44129.51, 28964.52, 168002.01, 40752.99, 170008.03, 31291.91, 33125.49, 27124.84, 96975.67, 92319.46, 16551.5, 34118.03, 49626.88, 115552.99, 66776.86, 16760.86, 64595.24, 41570.51, 25507.65, 68082.46, 81712.78, 70660.63, 26274.39, 86358.89, 114376.16, 49823.6, 26734.13, 86565.89, 37242.8, 32041.73, 75196.97, 28362.33, 38682.92, 23901.81, 117550.68, 63608.89, 25782.06, 62566.62, 97366.88, 166248.31, 52577.58, 70682.89, 168240.41, 44104.96, 30811.68, 55551.13, 31927.51, 49561.22, 48375.09, 77838.2, 22481.61, 34577.78, 22872.12, 85922.66, 25407.21, 31253.95, 28085.74, 123464.27, 68181.9, 78471.95, 34172.19, 61625.35, 50895.13, 68255.34, 67326.14, 22050.74, 13661.74, 118302.39, 72051.28, 44714.09, 12657.88, 41444.26, 57899.7, 24663.31, 124158.84, 93997.24, 78303.0, 130865.97, 14953.63, 28339.79, 107342.78, 56669.88, 46964.53, 30346.0, 17537.58, 47848.98, 30495.36, 28126.55, 27214.63, 55691.59, 21146.04, 74203.95, 27372.35, 137798.84, 115625.62, 118401.09, 73526.43, 48684.59, 59269.34, 25656.63, 139864.39, 135070.56, 20568.57, 37852.83, 39051.85, 89172.48, 149328.78, 31296.29, 21579.15, 83126.22, 59622.3, 23423.37, 36906.24, 125373.36, 33862.8, 23932.52, 57496.63, 18315.49, 70294.66, 44862.29, 38734.95, 27224.37, 55352.41, 42406.66, 61890.39, 45792.6, 196855.08, 47337.78, 29749.53, 88414.51, 42837.87, 45074.02, 36162.73, 57925.79, 10953.58, 49256.28, 34246.69, 172064.39, 56573.33, 175785.74, 30723.31, 95620.64, 83471.85, 37694.66, 25026.36, 33186.24, 42427.77, 124220.33, 69773.03, 35475.4, 21517.21, 31740.1, 92323.38, 97965.46, 39061.66, 47670.23, 21310.28, 92779.06, 53621.67, 62998.62, 45790.3, 44227.65, 28710.22, 45737.57, 197193.11, 38991.61, 53081.84, 79523.72, 37179.29, 14918.52, 22862.63, 36105.9, 81289.67, 137062.15, 36032.1, 53240.9, 70738.75, 127262.59, 45069.19, 26626.08, 90216.82, 28927.26, 78689.44, 86339.35, 31206.26, 45762.07, 50295.43, 44991.25, 37747.58, 94494.15, 50812.44, 14258.38, 124529.09, 46461.77, 38978.24, 177010.64, 142387.74, 113929.58, 42063.23, 35493.08, 127397.12, 40414.64, 63034.78, 44328.26, 44994.57, 68020.29, 47784.13, 78281.56, 27107.15, 91048.63, 20404.51, 40997.32, 149679.61, 20070.43, 43885.51, 19895.63, 44462.99, 39580.1, 106973.12, 32169.01, 55557.74, 28913.3, 49282.47, 46167.44, 16469.21, 20415.73, 16876.9, 21460.31, 37237.06, 49958.64, 74044.9, 38361.54, 21886.12, 31505.25, 61879.0, 43502.02, 60875.77, 52258.24, 134473.26, 82064.36, 152916.9, 122721.48, 164325.86, 50348.37, 47996.34, 80624.71, 75707.61, 59524.16, 103211.37, 103733.42, 83472.53, 123239.44, 134399.25, 104515.85, 163933.14, 46877.26, 93008.09, 56765.63, 29280.96, 99233.85, 45439.65, 46526.16, 33060.83, 54947.4, 37281.47, 50284.78, 20891.61, 103976.51, 29199.07, 84267.44, 87330.16, 13461.13, 121447.12, 153032.63, 37938.05, 29818.63, 116720.2, 100679.61, 51521.01, 91930.76, 46933.09, 28886.17, 20931.19, 19409.79, 121000.43, 11654.32, 48635.84, 181670.16, 46384.46, 40275.75, 19672.12, 49884.09, 23454.14, 53744.5, 118295.27, 85365.81, 113934.69, 96086.08, 13285.36, 23986.42, 27658.04, 81626.88, 31143.42, 28910.18, 42991.88, 99990.93, 19540.92, 40461.16, 17985.07, 40738.57, 21375.15, 64362.73, 102826.28, 48659.38, 95596.98, 79324.15, 27296.59, 57473.89, 96997.92, 109302.88, 74340.63, 76181.28, 66866.73, 99662.56, 21166.86, 40814.37, 116829.77, 115735.66, 109705.76, 28231.55, 137708.95, 37917.39, 77589.45, 155566.55, 29596.58, 22846.23, 31642.24, 50412.23, 53637.58, 98578.23, 40497.54, 50458.44, 146287.66, 22380.85, 93438.16, 26929.87, 54005.45, 24642.92, 21562.33, 32236.49, 34005.31, 75688.34, 52389.93, 94025.85, 30536.89, 25386.1, 64302.99, 80726.94, 26139.54, 41506.45, 85175.48, 118215.9, 23268.82, 67315.15, 41273.9, 33121.05, 112515.03, 88735.21, 37435.96, 40151.23, 13079.45, 20605.91, 65766.59, 35854.67, 47237.07, 31086.1, 83695.41, 30173.98, 38028.16, 26248.55, 46510.23, 45615.72, 65603.44, 31366.39, 78282.06, 45932.43, 47476.09, 48209.2, 38660.05, 128042.88, 84585.35, 186992.05, 17461.19, 29378.89, 41222.18, 38416.33, 30555.43, 62152.98, 32643.98, 30217.69, 49162.91, 72520.16, 93425.82, 87026.33, 124775.54, 114564.57, 25417.76, 34312.64, 103632.66, 23529.56, 36188.77, 187554.0, 148866.27, 26269.94, 49015.97, 90694.63, 23983.56, 116074.37, 92518.12, 70350.65, 73049.6, 34609.82, 21849.05, 40039.17, 32662.92, 44945.68, 38704.07, 44045.54, 36290.5, 33637.62, 114860.86, 121316.27, 71817.89, 100101.6, 44385.35, 19192.06, 43030.55, 70734.74, 43785.77, 84820.68, 26146.05, 37104.15, 101872.44, 25987.09, 110562.05, 38108.69, 160324.24, 40618.07, 24546.9, 23933.33, 78210.61, 61522.84, 21141.06, 37973.59, 27164.28, 39409.96, 48222.1, 29784.77, 124014.45, 26893.37, 163477.75, 41693.69, 167409.37, 60632.23, 34386.03, 41468.7, 32212.18, 74484.72, 58770.61, 21722.04, 166487.1, 95521.82, 61695.15, 53230.9, 27408.96, 31482.07, 34748.84, 44644.62, 49547.24, 62969.44, 47587.66, 18075.2, 23527.81, 111582.89, 103331.03, 53218.45, 56630.95, 35491.41, 128420.58, 35164.05, 38549.27, 73427.69, 34340.94, 21028.45, 32039.98, 18934.82, 47175.0, 50217.15, 92281.67, 111985.97, 24069.42, 38521.64, 31621.54, 44917.89, 53855.76, 81412.76, 35436.77, 75825.88, 35928.73, 66436.62, 44859.75, 76961.14, 30438.84, 35179.51, 98044.84, 125550.27, 38828.27, 61432.0, 26420.67, 33335.1, 29482.17, 25372.4, 127710.89, 43689.27, 30402.45, 44777.34, 68442.49, 43170.98, 20398.85, 85524.26, 72075.37, 98910.04, 112173.35, 45388.46, 18321.05, 85569.89, 108305.83, 24683.21, 46110.54, 68332.59, 138207.0, 21266.3, 113248.56, 56777.46, 108451.53, 26879.94, 123680.08, 27251.06, 30047.83, 39496.17, 33550.34, 42107.56, 33966.97, 67260.25, 84999.08, 165311.63, 54859.28, 98544.35, 59319.62, 31729.43, 89127.05, 54667.21, 127763.77, 155776.16, 32746.02, 24015.2, 43674.68, 28416.38, 22574.51, 102902.78, 121633.7, 73069.41, 98441.77, 47229.02, 18028.21, 97252.42, 38735.1, 57569.98, 42027.97, 14905.77, 136085.11, 54400.7, 24365.29, 76273.45, 90017.38, 67555.17, 47711.15, 41718.69, 42015.11, 30676.7, 111056.74, 13885.24, 59559.88, 145961.13, 32879.99, 78359.97, 22131.77, 77160.44, 42200.05, 113692.21, 24213.37, 136863.89, 27312.11, 43345.58, 115895.35, 63910.34, 111132.39, 74945.59, 32412.6, 67558.2, 15179.16, 199830.37, 57863.75, 38653.73, 79240.34, 99507.66, 80060.45, 93503.11, 33935.64, 132270.38, 145506.16, 23857.78, 87784.41, 49511.26, 71493.14, 59731.48, 20369.2, 43644.62, 52159.14, 42171.05, 10956.9, 79967.71, 20765.94, 84904.92, 95703.17, 111362.94, 100862.92, 99067.03, 24706.05, 127523.93, 133655.7, 62641.26, 63605.17, 27338.82, 32180.41, 34006.04, 92900.09, 26890.49, 119006.72, 43394.63, 27937.53, 66061.67, 34357.74, 88876.39, 28239.96, 40895.73, 15123.32, 52924.71, 35539.25, 73624.62, 32058.42, 42846.02, 25219.87, 26669.46, 89465.47, 106843.93, 72525.78, 55492.27, 110519.99, 147196.58, 23376.57, 53432.88, 14506.59, 15512.11, 35232.42, 49947.21, 30670.81, 54458.83, 59210.97, 10612.42, 31277.85, 31291.14, 31122.12, 36145.67, 61310.25, 29940.02, 28622.73, 45102.07, 55755.98, 98562.27, 20558.85, 33213.06, 23495.07, 26663.59, 124525.5, 77224.97, 43231.51, 136229.49, 53438.33, 107502.96, 122841.7, 73392.14, 44814.12, 68810.68, 46443.64, 33580.74, 66654.88, 20349.05, 23207.32, 28046.28, 44323.61, 18569.32, 44132.5, 42607.76, 89202.76, 34105.64, 32066.18, 25536.18, 119085.1, 12723.53, 48738.69, 29857.57, 33398.23, 57451.96, 82623.19, 51933.22, 85854.63, 25507.25, 41021.06, 27596.17, 27556.35, 24741.61, 165704.0, 20807.72, 25629.98, 143493.58, 73123.88, 55429.49, 98028.49, 17397.35, 52700.54, 37821.67, 85389.32, 42913.23, 38000.33, 39959.02, 25825.23, 87023.08, 22296.46, 36339.75, 35409.1, 34204.68, 27979.04, 74834.07, 46343.97, 56477.24, 93365.59, 30222.61, 66762.61, 35998.02, 79613.85, 89918.99, 35766.13, 34608.47, 66673.93, 11866.21, 76050.24, 141702.48, 80265.54, 33726.38, 29682.33, 63112.19, 55658.63, 72406.09, 94855.55, 168349.12, 39586.23, 29943.84, 179149.77, 16544.61, 49907.97, 30520.01, 18000.27, 12504.17, 164192.02, 29362.61, 38833.29, 76366.04, 39651.6, 69530.25, 40701.1, 120155.03, 111242.01,

20747.74, 70153.72, 128243.69, 135996.47, 131696.07, 36894.6, 31753.24,
61910.06, 57225.78, 40631.71, 37827.38, 47517.72, 25338.27, 75537.15, 38294.08,
100891.21, 146427.93, 33778.57, 64531.27, 34011.97, 100004.82, 159353.47,
66974.09, 187712.92, 81037.69, 81819.26, 61345.66, 108299.36, 39526.94,
76950.91, 45391.81, 38529.77, 26671.93, 27399.81, 57687.75, 73021.04, 44839.36,
139283.05, 82191.16, 26014.67, 37690.17, 56894.74, 109524.77, 125410.99,
22482.99, 68658.49, 52986.2, 41670.22, 33937.37, 65860.02, 39877.02, 27605.91,
35851.74, 71793.95, 55901.41, 89306.05, 43317.28, 123044.26, 130617.1,
163677.32, 49219.43, 65434.22, 25026.06, 25202.45, 40542.06, 56275.78, 25439.61,
80984.53, 53529.24, 53651.78, 38856.29, 29291.19, 92550.03, 58600.37, 49980.18,
18959.37, 40677.62, 20204.57, 188221.5, 33480.42, 32070.41, 34060.35, 152569.01,
149630.26, 118496.97, 67638.35, 44267.14, 65110.29, 38399.19, 40519.36,
56420.57, 78055.17, 107255.64, 30042.01, 83450.96, 45184.12, 49018.62, 25954.42,
44848.23, 128434.01, 97359.28, 43494.14, 99832.24, 43113.09, 141904.68,
29645.32, 23219.19, 71347.29, 32017.76, 71425.93, 35490.36, 76087.19, 95892.5,
51973.04, 156851.59, 58108.54, 75960.8, 14152.37, 31300.99, 59020.94, 38798.93,
130181.62, 106987.73, 49026.34, 67823.2, 132180.96, 19987.03, 189470.72,
105493.96, 48420.42, 14997.33, 34113.07, 49360.47, 18824.01, 35385.91, 35796.01,
193910.94, 69346.24, 77597.56, 49883.04, 15834.55, 114337.27, 21498.09, 49391.7,
38845.78, 129906.02, 28085.02, 17122.29, 81569.47, 37652.09, 81464.47, 80081.14,
37476.13, 43001.78, 72452.3, 80192.75, 67457.42, 43705.55, 84524.37, 82104.6,
34860.15, 28509.85, 49840.83, 67304.67, 24442.67, 47801.85, 39784.23, 21474.69,
37512.11, 59314.16, 47046.51, 31778.6, 74308.76, 17624.29, 72029.31, 86583.28,
14695.28, 22995.71, 63722.34, 45067.27, 139328.37, 183213.28, 30041.79,
79425.55, 136884.24, 63154.17, 47438.9, 102172.14, 20402.15, 39112.73, 28185.81,
28742.63, 22457.97, 80315.15, 134501.9, 19769.39, 138290.23, 32970.53,
104829.84, 82488.89, 71811.63, 97232.79, 50850.46, 56864.93, 59856.26,
178631.64, 43396.89, 33557.43, 125213.24, 63364.14, 85628.37, 16291.38,
90405.25, 24806.02, 37260.75, 26351.54, 100741.05, 68252.43, 78289.87, 55741.29,
161302.71, 49179.41, 127765.17, 45429.43, 18731.25, 173357.02, 40406.68,
137115.09, 14934.42, 34837.52, 45974.78, 23673.43, 17911.3, 37214.75, 22125.05,
44458.44, 46853.74, 32278.28, 46659.98, 17293.73, 75128.09, 145009.55, 26274.43,
106165.33, 87693.83, 129984.37, 123782.97, 38421.58, 30740.67, 39706.43,
38330.66, 31789.67, 126263.56, 34472.0, 47513.86, 94224.06, 29546.76, 103126.28,
60393.63, 56168.9, 20083.71, 21729.58, 117658.81, 92914.3, 49821.89, 56087.0,
42685.21, 39887.67, 48070.83, 27970.26, 18378.33, 39456.15, 133518.81, 79129.69,
199184.63, 20939.95, 85833.34, 36003.82, 89990.33, 77854.13, 63219.67,
102929.38, 46163.4, 55264.2, 116361.76, 71771.1, 21299.59, 20258.27, 77626.42,
55888.65, 36932.32, 44149.82, 49960.27, 160023.0, 48330.52, 81443.97, 21733.23,
79298.24, 58371.56, 195748.84, 72850.77, 20478.54, 34004.21, 19079.62, 46347.75,
79897.51, 23688.7, 55730.97, 94866.43, 13983.39, 46936.55, 116934.69, 85205.27,
18714.63, 148306.28, 121869.1, 65376.54, 23193.14, 31216.84, 71707.74,
125155.52, 55669.65, 73200.09, 34649.98, 67624.76, 28072.88, 27896.41, 22884.31,
46959.67, 26052.98, 10523.68, 93956.01, 132909.15, 47173.28, 41899.17, 20020.71,
143074.98, 45328.4, 134240.91, 67426.0, 92423.28, 118226.47, 63281.31,
187794.11, 82498.94, 23668.51, 66226.97, 15877.42, 76088.44, 147429.4, 67448.17,
26077.57, 62304.31, 18794.98, 131063.14, 33429.81, 37773.27, 127903.62,
101067.04, 16930.08, 71460.28, 35788.4, 80854.29, 24654.41, 70526.9, 28501.32,

62492.87, 21125.9, 73023.06, 105896.13, 48318.51, 25754.12, 28882.01, 36061.01, 31672.92, 14088.57, 41216.99, 152449.19, 17748.79, 83794.13, 38238.59, 112828.33, 32806.54, 36820.43, 87504.33, 34970.71, 25073.79, 148768.74, 76787.01, 63559.18, 38594.24, 18042.38, 16705.3, 36298.01, 49599.08, 41160.87, 48005.57, 57847.63, 31853.89, 81411.3, 39721.24, 74163.67, 21074.31, 79000.77, 49733.66, 15439.05, 33704.53, 149578.01, 16135.07, 30121.86, 23619.22, 30299.01, 64130.24, 26798.27, 38163.87, 66081.3, 35892.58, 37846.39, 46019.36, 126698.19, 79771.74, 32789.64, 21254.62, 92418.3, 40212.54, 11400.17, 24258.73, 51006.35, 38219.69, 41131.39, 50278.04, 34987.18, 52326.45, 56264.58, 15978.24, 112380.58, 88765.72, 53298.44, 64968.78, 25887.85, 47331.83, 32102.65, 55330.4, 25377.21, 35052.01, 135609.23, 30791.9, 41815.33, 79618.92, 21720.51, 95995.69, 22222.76, 39656.55, 46138.66, 66329.76, 25215.4, 25926.8, 27979.03, 66068.91, 85490.13, 65360.38, 104991.05, 15820.44, 132165.06, 48943.33, 49827.26, 47423.51, 34293.15, 173527.39, 23944.84, 20544.1, 38636.48, 25956.24, 22627.38, 67393.83, 41413.41, 28481.35, 106395.32, 37065.28, 20909.68, 153846.24, 17302.79, 41075.73, 94478.57, 43198.44, 24747.33, 50881.11, 35479.77, 130658.21, 62081.74, 14380.48, 137012.19, 84972.73, 27612.9, 16593.81, 32384.88, 21863.57, 77251.08, 140701.42, 97527.44, 121527.25, 32474.64, 34955.03, 33650.8, 101734.2, 79888.97, 59218.12, 143046.44, 129895.98, 38837.21, 37856.17, 51977.88, 42582.44, 57207.31, 98119.43, 49816.87, 99128.17, 23838.09, 68905.86, 25949.84, 58683.12, 134841.93, 42060.69, 22434.39, 32525.59, 50432.49, 45928.43, 21966.12, 10282.41, 28339.37, 70796.28, 30264.59, 19599.56, 70832.99, 25652.85, 35808.53, 49009.04, 131585.34, 17548.4, 57997.37, 14733.81, 36092.01, 42700.15, 74380.65, 47424.23, 31123.12, 147139.15, 137684.89, 25403.47, 45418.2, 37815.33, 25303.13, 40265.85, 24881.23, 57283.58, 30114.46, 48140.13, 47990.95, 44426.48, 44306.47, 29443.17, 61254.42, 30669.69, 121256.37, 62642.77, 32555.97, 158825.13, 29108.39, 44861.44, 65916.98, 42404.81, 127718.13, 28644.73, 70664.28, 60368.1, 74075.01, 16025.36, 100170.5, 19936.65, 83799.14, 124278.99, 15634.78, 87297.42, 38809.91, 75998.39, 54619.77, 20537.76, 19104.39, 134294.74, 144223.94, 51529.72, 73287.37, 32224.96, 23798.35, 110082.85, 102478.87, 64071.47, 63371.62, 64480.48, 40047.58, 34017.11, 36770.6, 45593.75, 30571.71, 65023.66, 109057.44, 87525.68, 42855.62, 102488.18, 24838.44, 181463.75, 110399.56, 65140.13, 73529.37, 22258.88, 57052.46, 30284.24, 57599.99, 47305.96, 139542.51, 49682.3, 43283.21, 75844.81, 34427.23, 17058.36, 42059.77, 91881.93, 29717.3, 132358.14, 31394.07, 130409.38, 79351.61, 35976.12, 88104.24, 71057.35, 91392.2, 84528.7, 37486.89, 33393.63, 109631.48, 138496.39, 59870.02, 16914.36, 62977.73, 40499.16, 45382.03, 33486.18, 18172.3, 115949.34, 32809.21, 84826.17, 179815.18, 97701.71, 25534.72, 129403.15, 24911.93, 38150.4, 47205.78, 97631.1, 85381.78, 105414.57, 40824.76, 39167.7, 40090.9, 38574.14, 54790.27, 46104.95, 27760.78, 24097.15, 48702.25, 87221.2, 110541.54, 48096.79, 41221.58, 49279.16, 29825.78, 45233.92, 33132.85, 40682.15, 83016.96, 72672.55, 34466.29, 57834.6, 86427.14, 67943.41, 39947.9, 42820.07, 45519.65, 32708.43, 69890.01, 28055.03, 146615.9, 33816.17, 57981.85, 34449.75, 196267.05, 77006.26, 15848.95, 79776.8, 47383.09, 41543.3, 28707.08, 67290.69, 33610.18, 90075.6, 39310.08, 77492.05, 78298.04, 120122.08, 28203.42, 20870.39, 29443.24, 91518.68, 84856.23, 129941.88, 182945.96, 35480.95, 80286.53, 47712.48, 37799.92, 59052.22, 21304.82, 31292.55, 78329.57, 117545.04, 57424.17, 35473.73, 47983.12, 36788.62, 32552.74, 45866.22, 32082.15, 33651.78, 51560.34, 25734.74, 30763.36, 42842.59, 26920.23, 29479.29,

75297.73, 37367.23, 76302.29, 19970.36, 134698.41, 23426.47, 52042.03, 76680.72,
25176.53, 134827.36, 47628.42, 74078.09, 37349.66, 36330.14, 113934.84,
84199.74, 26477.83, 39204.86, 46987.55, 28044.12, 36970.77, 79397.35, 29541.06,
75418.71, 51852.6, 65876.03, 24017.79, 19112.92, 58347.88, 40979.27, 93796.8,
33337.29, 18157.85, 46223.31, 21512.53, 84693.78, 57721.47, 30326.45, 34829.67,
27806.09, 19700.98, 73193.4, 28985.61, 32404.73, 44616.78, 51465.76, 23231.49,
96175.41, 26431.38, 34651.72, 46292.62, 31660.45, 75510.91, 27492.29, 66311.78,
88056.1, 122527.27, 57086.2, 38040.47, 18965.88, 46228.9, 67289.68, 65246.95,
56745.52, 37257.87, 15314.73, 46996.72, 107698.6, 44059.05, 36007.5, 80730.04,
28767.29, 32265.72, 37873.59, 56549.1, 20646.21, 16985.35, 40424.56, 93541.53,
22197.25, 156024.68, 94222.14, 48699.54, 35508.41, 83865.31, 33894.24,
190616.24, 97797.94, 51824.15, 53846.43, 34086.78, 17071.29, 67102.6, 70840.62,
100253.54, 14011.88, 109551.2, 92609.05, 23244.7, 190570.95, 138363.68,
128889.96, 17844.4, 25225.65, 118476.37, 115137.35, 49903.24, 62062.55,
36590.11, 105127.84, 111035.21, 66760.84, 75796.37, 74240.6, 12193.43, 19913.64,
89610.02, 85438.55, 86922.69, 107064.96, 84323.86, 54059.99, 40368.82, 46890.15,
62189.86, 50880.42, 46875.72, 63668.41, 42243.11, 104051.06, 84040.43,
151022.18, 45972.42, 40121.58, 18265.57, 21945.19, 92477.65, 65687.37,
112283.21, 32523.17, 36442.12, 47094.22, 40382.22, 50115.39, 96313.47, 45027.07,
71247.36, 19934.65, 105432.12, 89689.09, 33435.3, 13847.81, 24564.68, 41114.63,
36493.34, 49582.51, 90778.61, 61499.75, 72900.55, 25188.13, 62702.03, 190251.16,
45549.11, 31277.56, 45777.47, 31739.4, 143021.87, 168169.76, 82777.44, 16609.97,
43963.65, 91378.77, 42817.43, 22436.24, 35533.84, 71366.18, 63717.2, 57130.53,
89910.38, 25398.86, 34372.12, 180967.84, 129459.67, 72429.3, 20243.06, 90155.59,
107212.64, 15775.99, 51128.38, 24082.61, 28861.94, 60817.33, 69531.49, 62113.65,
30874.39, 29386.34, 54635.73, 28978.35, 57944.46, 26294.69, 60771.14, 78159.14,
60787.16, 66988.74, 53981.54, 50337.42, 70413.85, 51989.18, 48308.89, 50910.7,
42966.87, 38967.54, 50181.97, 128293.71, 29001.3, 56801.51, 78215.79, 18927.56,
106335.52, 147281.6, 88350.35, 26257.86, 13489.89, 141084.39, 135145.06,
18225.91, 45335.26, 36769.24, 53986.88, 39377.84, 126548.67, 196531.3, 69040.41,
38749.31, 40341.64, 15622.52, 36859.53, 42490.23, 55690.98, 68139.38, 72158.63,
165436.39, 62029.08, 176140.29, 39593.39, 75182.95, 15229.34, 24437.25,
91618.52, 82955.85, 98181.07, 69579.75, 23874.63, 24333.9, 12686.12, 178082.14,
78970.07, 49694.51, 51651.29, 13220.0, 21284.87, 34919.78, 65045.6, 38830.47,
48380.01, 144865.13, 84883.68, 33744.41, 68150.13, 187185.72, 32540.37,
99530.35, 32831.35, 142926.39, 138562.23, 48556.56, 34454.13, 68006.33,
116193.81, 82046.03, 113707.25, 45203.22, 59615.81, 34775.54, 18253.6, 174523.4,
65462.18, 41123.05, 41644.29, 24939.74, 81385.67, 38803.11, 62896.17, 49054.93,
92013.43, 78185.44, 183108.7, 48313.05, 118838.37, 42116.04, 34217.97, 68518.24,
45255.95, 89227.65, 15553.39, 70215.89, 63603.22, 79277.84, 24785.69, 40844.55,
28516.84, 72779.05, 14153.38, 111585.6, 19006.61, 51625.83, 57563.39, 33636.42,
101835.68, 58742.39, 19213.11, 22506.25, 24218.1, 56789.28, 31185.23, 148123.61,
62618.94, 40007.73, 129962.02, 93625.66, 179023.53, 152268.91, 38490.29,
27078.47, 144817.3, 49527.6, 43649.29, 24634.36, 46494.34, 30632.64, 115779.1,
121773.75, 89459.28, 43522.39, 77456.23, 19540.39, 31134.6, 112548.58, 29756.68,
22438.94, 27056.75, 97254.57, 94490.68, 23272.09, 139767.5, 22638.68, 55148.79,
118022.8, 131919.19, 136218.74, 103078.35, 177684.01, 114640.85, 37647.73,
40903.27, 88154.84, 21970.7, 82944.98, 23800.64, 67247.94, 96594.04, 53731.51,

12563.0, 39300.22, 94832.98, 82860.2, 48191.46, 191685.46, 30762.9, 96521.75, 36008.97, 23165.03, 38785.58, 35691.58, 40090.63, 80421.54, 59202.87, 44575.14, 33214.56, 95974.15, 137604.41, 53599.35, 87288.36, 82227.93, 40916.87, 36640.16, 52715.17, 69169.62, 151624.65, 133591.04, 33703.29, 110344.09, 48265.49, 18285.52, 121371.71, 90520.67, 42056.51, 46856.02, 106082.31, 146577.51, 25309.98, 58679.39, 135755.24, 98482.13, 31062.91, 20204.42, 98428.05, 36033.24, 30578.17, 96475.89, 57848.07, 172938.63, 59210.62, 140547.56, 40700.28, 40419.85, 28848.52, 26746.15, 40489.72, 22349.42, 34501.36, 81440.59, 69223.55, 134773.56, 103332.63, 32385.88, 30027.57, 93273.49, 56643.82, 25351.71, 56345.65, 80236.29, 73462.56, 101016.3, 24397.15, 49074.39, 20697.1, 71768.87, 158276.95, 190922.58, 35056.18, 132584.38, 184887.99, 138694.3, 18950.95, 91556.35, 23231.75, 24839.99, 139600.32, 75652.43, 79323.69, 35336.32, 61948.75, 84335.83, 65670.76, 22173.93, 28256.31, 30149.58, 48272.42, 85928.86, 93506.9, 26392.32, 63285.31, 60795.67, 84688.65, 54132.78, 84220.85, 22306.01, 59459.45, 45307.75, 21354.85, 28256.48, 95793.35, 24735.49, 57702.18, 46132.54, 75295.9, 42511.7, 34590.12, 193689.56, 29869.71, 70494.51, 42153.46, 51852.01, 45802.78, 32748.52, 26806.72, 118377.3, 43952.27, 129279.25, 79603.46, 42173.31, 70098.14, 45662.61, 13924.75, 46542.68, 144978.39, 40473.62, 84242.56, 199898.29, 20972.65, 35513.46, 19556.28, 37376.78, 41970.53, 64020.41, 99203.58, 109099.92, 35029.58, 104344.8, 62191.99, 148855.09, 85845.35, 48689.11, 30545.85, 49498.11, 28845.85, 83860.99, 57227.05, 17012.39, 110392.27, 138341.08, 142283.87, 75401.67, 64816.82, 110474.29, 48602.89, 30349.01, 38654.06, 49442.14, 70796.76, 36107.0, 82592.82, 40708.48, 43852.7, 46508.3, 35873.32, 147873.75, 68104.22, 119962.88, 159538.25, 47343.45, 73954.05, 64586.21, 133777.32, 26912.63, 46546.48, 43832.93, 14120.98, 21182.75, 25374.47, 89460.17, 99946.75, 97265.81, 37157.13, 44313.34, 36082.74, 42726.95, 37401.64, 84788.82, 146516.37, 21990.07, 35957.08, 35838.54, 72280.1, 53312.32, 67794.0, 43685.23, 36766.77, 24060.43, 105580.56, 18153.19, 57365.7, 43929.57, 116535.43, 128812.83, 153817.96, 53685.54, 56050.7, 40906.65, 22413.9, 17308.47, 73664.69, 40111.17, 111846.03, 47204.33, 33679.37, 92559.31, 15386.41, 15924.3, 172683.42, 101508.0, 47122.48, 73838.24, 101636.9, 91493.2, 55313.51, 28216.53, 71629.55, 26698.67, 111645.54, 44932.27, 53738.21, 179158.3, 66734.13, 35000.55, 149876.4, 59729.92, 41638.82, 144629.59, 46460.2, 85752.71, 69816.87, 68149.07, 78222.96, 59883.59, 34526.7, 51957.06, 30750.88, 14022.98, 121050.6, 69127.65, 88377.93, 40655.25, 20007.02, 88637.39, 43332.69, 30810.85, 89004.55, 95963.14, 30076.69, 12291.97, 87037.21, 77108.92, 52608.18, 21724.15, 112344.17, 55058.59, 39777.87, 116772.16, 34714.03, 111709.08, 99976.92, 45700.23, 63107.77, 18679.46, 129029.51, 65726.93, 43297.87, 80289.91, 38631.01, 39049.14, 81477.53, 12910.42, 46280.61, 30408.04, 42244.57, 85871.68, 32383.09, 49288.88, 19399.14, 35982.25, 54164.89, 80288.52, 29611.04, 73742.97, 71901.63, 56659.32, 40246.48, 18330.86, 14033.22, 125359.94, 129474.93, 18275.96, 38509.13, 60740.57, 48704.14, 27974.65, 37139.04, 61330.39, 66070.66, 25464.39, 18639.46, 63194.43, 119444.19, 76120.97, 35467.42, 51566.41, 170685.84, 34427.1, 84126.7, 60906.91, 26205.31, 37559.19, 176979.32, 97266.22, 91465.93, 87192.4, 18004.75, 113064.88, 93112.36, 37668.93, 28903.13, 23897.75, 24922.07, 129514.92, 104258.14, 40014.87, 14656.75, 53021.47, 40685.59, 23408.7, 38039.79, 33165.08, 55739.21, 25983.43, 79311.57, 27619.17, 44962.55, 20084.08, 33441.34, 150418.92, 127365.96, 28065.54, 94663.4, 41005.1, 50546.75, 71503.15, 172596.59, 35635.12, 109903.01, 88044.09, 25917.7,

83537.67, 199595.1, 57969.93, 27174.46, 31668.86, 37012.64, 80585.04, 72013.26,
73512.79, 26674.64, 43869.61, 40710.96, 47007.74, 45647.11, 135015.09, 44688.99,
25013.34, 81527.88, 31480.42, 40982.39, 44587.83, 32608.01, 42347.76, 74976.81,
77959.09, 81299.53, 67237.73, 63986.38, 88375.03, 148315.61, 41170.35, 60713.74,
53745.67, 18988.77, 23123.35, 37025.2, 93309.61, 42919.65, 89710.74, 140958.61,
81833.67, 49231.07, 131552.94, 26496.79, 135419.61, 74633.79, 18219.95,
22289.59, 39869.01, 150756.55, 40810.38, 63281.39, 20725.34, 171611.31,
137770.61, 77056.55, 64617.35, 16509.18, 39759.42, 42739.05, 18006.37,
104773.41, 38097.79, 55395.31, 77412.98, 28084.45, 35889.54, 33004.41, 23490.38,
46328.85, 42663.54, 64693.39, 33226.78, 60948.11, 126468.96, 25538.68, 36281.51,
86351.23, 43278.4, 54398.53, 158863.85, 35493.81, 71605.04, 26235.51, 64307.81,
46337.29, 42540.12, 39689.75, 45265.57, 65138.91, 49434.8, 56650.45, 65194.82,
31452.64, 24893.44, 70524.43, 30567.79, 88620.7, 71865.87, 28959.57, 134756.15,
92326.98, 182733.61, 155698.45, 14608.82, 135653.29, 121267.47, 78923.22,
73545.13, 55304.22, 39447.15, 32383.99, 115525.14, 76010.05, 36586.43, 35852.98,
141291.15, 89650.81, 117715.31, 117161.65, 62546.49, 35410.19, 136479.43,
51372.93, 20701.13, 44032.09, 121037.17, 81059.82, 44232.93, 111972.03,
15278.68, 19490.75, 77354.74, 35639.56, 77471.44, 79746.59, 45358.62, 15944.06,
149798.81, 48351.59, 177403.84, 41609.23, 78723.21, 17437.62, 33001.6, 69722.32,
39730.76, 137131.8, 75965.47, 190719.1, 148225.53, 34070.33, 72730.48,
110423.74, 75849.44, 38785.74, 90840.09, 34112.67, 98011.43, 26708.76, 15932.54,
78620.76, 59299.43, 30993.43, 26362.24, 55230.58, 46564.45, 24445.62, 76576.74,
63990.83, 56179.66, 47241.65, 32145.06, 35680.05, 57808.17, 84091.44, 60590.25,
82452.37, 123911.72, 99475.53, 80881.98, 67209.08, 38686.4, 45749.22, 33355.11,
147330.52, 11388.66, 30683.01, 55084.81, 62625.17, 34515.49, 64036.86, 79407.82,
123715.35, 91283.74, 16198.46, 15506.76, 57443.63, 133914.74, 55685.99,
44119.32, 37633.31, 20261.3, 155790.37, 40639.37, 35875.92, 134280.14, 17992.33,
100687.75, 57770.05, 63965.25, 46699.74, 66507.3, 12223.87, 34996.58, 25821.57,
23748.45, 34570.22, 40781.45, 38840.25, 63206.7, 100041.46, 82697.8, 48932.54,
166505.39, 24960.72, 63093.55, 135095.29, 44383.39, 21776.32, 57662.06,
45702.64, 32097.73, 30972.48, 21849.45, 37808.98, 50877.06, 46038.72, 135155.14,
12845.68, 41910.24, 17279.04, 28270.09, 79232.0, 26830.05, 75369.66, 146836.02,
23943.05, 20197.53, 42562.05, 50522.49, 107103.62, 61717.55, 38446.94, 27452.74,
90792.71, 82286.28, 77826.28, 47964.6, 75196.64, 72818.37, 58363.17, 94351.44,
61995.47, 23564.8, 42277.73, 42981.24, 11260.17, 20389.55, 32573.65, 45988.77,
18821.54, 20012.04, 23258.72, 25578.69, 50637.89, 101327.74, 47951.41, 47508.85,
37248.18, 36732.57, 23234.85, 99556.54, 43846.71, 94578.61, 40706.73, 46457.01,
110122.25, 134636.6, 121924.9, 85975.81, 32829.4, 101336.73, 64840.85, 83275.02,
28152.33, 41735.54, 130855.63, 88425.47, 120715.05, 120232.66, 23870.0,
77476.49, 93201.3, 56349.82, 35878.02, 83224.85, 145277.87, 72689.4, 44765.1,
38051.73, 17789.82, 93738.87, 41336.16, 82080.58, 75159.46, 60226.46, 102893.66,
34533.08, 51697.46, 56764.23, 52346.54, 45065.69, 183956.56, 127454.33,
41599.39, 173713.06, 25947.51, 27438.01, 38014.56, 25983.95, 143580.74,
39818.28, 46810.04, 41639.92, 57847.85, 39921.16, 76935.24, 102047.82,
114120.39, 132786.84, 53020.68, 23969.49, 58514.4, 40202.39, 66323.89, 34950.9,
16030.1, 16621.53, 38703.64, 71251.58, 80662.94, 127381.03, 55035.51, 78408.78,
38224.7, 47739.81, 96390.92, 31020.61, 74705.45, 36358.91, 53187.95, 134299.39,
47400.5, 30822.92, 147295.08, 187581.43, 43658.18, 18258.5, 78308.1, 124780.32,

```
119551.81, 89061.08, 83349.25, 98623.04, 101050.2, 78882.11, 83404.89, 52137.39,
131485.65, 44323.8, 74247.0, 53387.85, 77275.75, 81677.7, 88114.19, 22191.46,
34308.83, 15130.18, 32478.05, 102552.53, 33662.74, 65260.29, 32344.61, 30322.17,
54372.99, 22744.55, 45213.75, 45630.44, 20442.46, 17877.17, 14080.98, 91321.89,
114682.29, 19860.66, 120389.99, 53875.01, 96701.09, 65890.81, 98079.75, 45099.6,
31335.22, 150059.29, 30444.74, 14182.04, 36476.6, 147693.78, 56641.28, 21979.63,
37581.5, 133792.46, 22450.42, 29970.97, 27268.36, 12295.48, 19204.64, 25797.17,
95504.67, 41168.07, 66206.49, 23793.29, 79662.39, 27811.75, 74001.03, 91124.67,
70159.23, 36492.15, 99573.77, 42252.44, 55314.6, 63745.78, 40046.31, 86614.07,
29823.19, 88651.12, 29512.97, 31684.86, 92147.64, 22819.91, 47830.55, 59646.77,
49035.6, 26406.19, 93218.14, 38427.06, 67911.2, 69316.5, 47416.63, 59098.34,
31241.3, 91109.65, 10729.51, 16552.93, 38223.6, 128203.54, 45320.08, 41748.97,
56358.79, 78235.79, 191722.84, 41486.27, 37501.32, 42537.47, 38981.27, 21682.4,
35694.81, 59175.04, 15008.87, 29554.91, 92919.67, 30792.07, 35412.25, 112296.24,
74028.24, 56445.6, 42939.12, 17959.62, 141850.87, 89398.17, 22837.81, 120165.42,
63861.18, 98543.6, 77155.81, 37160.92, 57528.0, 26207.42, 47250.07, 54378.49,
22306.4, 178619.64, 34080.62, 76563.94, 48108.99, 31370.03, 65899.17, 42227.84,
17765.47, 46029.72, 25899.64, 22526.51, 18246.96, 101077.04, 91917.66, 87015.72,
26090.37, 20062.04, 140700.91, 65550.81, 32502.63, 71398.89, 109465.62,
50785.68, 85145.7, 79059.46, 67390.75, 45554.39, 184335.58, 33186.54, 44990.97,
20735.97, 72959.6, 81408.12, 67274.31, 145157.2, 68936.39, 130104.34, 68555.59,
85503.1, 175539.56, 30905.23, 77408.85, 17080.49, 89684.51, 32062.93, 170781.87,
199321.51, 194742.86, 155867.61, 93461.62, 44036.23, 41668.66, 44308.08,
38998.97, 16606.31, 30806.28, 54333.33, 31321.32, 24182.5, 12928.93, 70555.99,
48197.69, 43009.49, 31101.35, 175262.33, 77684.09, 138052.81, 34490.59, 93145.1,
78203.84, 93094.29, 31393.0, 111632.49, 99719.27, 26088.74, 62892.11, 82898.52,
47079.15, 110157.14, 29517.71, 92983.35, 38015.29, 63243.14, 175194.54,
82852.47, 104476.74, 53600.83, 66074.77, 33442.68, 139302.9, 145251.29,
60626.79, 35289.83, 77260.43, 61903.82, 32015.84, 93324.09, 21871.18, 193793.39,
198849.02, 157956.44, 119949.46, 27285.77, 31718.47, 27271.26, 57755.2,
134361.69, 48429.79, 47010.89, 23745.0, 21807.9, 58326.84, 31261.32, 87494.91,
44258.0, 24642.27, 85650.01, 16810.45, 25865.87, 33345.92, 35743.79, 139780.41,
33201.53, 34933.36, 94400.56, 131374.2, 44854.0, 35778.9, 42737.47, 61081.63,
20963.37, 40154.44, 29373.08, 21431.89, 36234.26, 17945.3, 132633.15, 142179.93,
60167.58, 30484.48, 34741.24, 64346.08, 88125.83, 43500.77, 42224.25, 47315.47,
75262.93, 43316.16, 147936.2, 62839.27, 183752.1, 32285.98, 61854.45, 19541.42,
80300.59, 60575.91, 45073.6, 40132.47, 61295.17, 50045.95, 41397.18, 29304.58,
26568.15, 96151.33, 46028.15, 149356.19, 132169.1, 126429.88, 34934.3, 38222.23,
63540.01, 75653.37, 27118.58, 44450.27, 60651.31, 36797.05, 39275.4, 34192.55,
19680.39, 33876.96, 32988.22, 39412.26]
Credit_Limit:    [100000.0, 150000.0, 200000.0, 50000.0, nan]
```

[ ]:
```
for col in numerical_cols:
  df[col] = df[col].fillna(df[col].median()) # Median Imputation for Numerical Columns
```

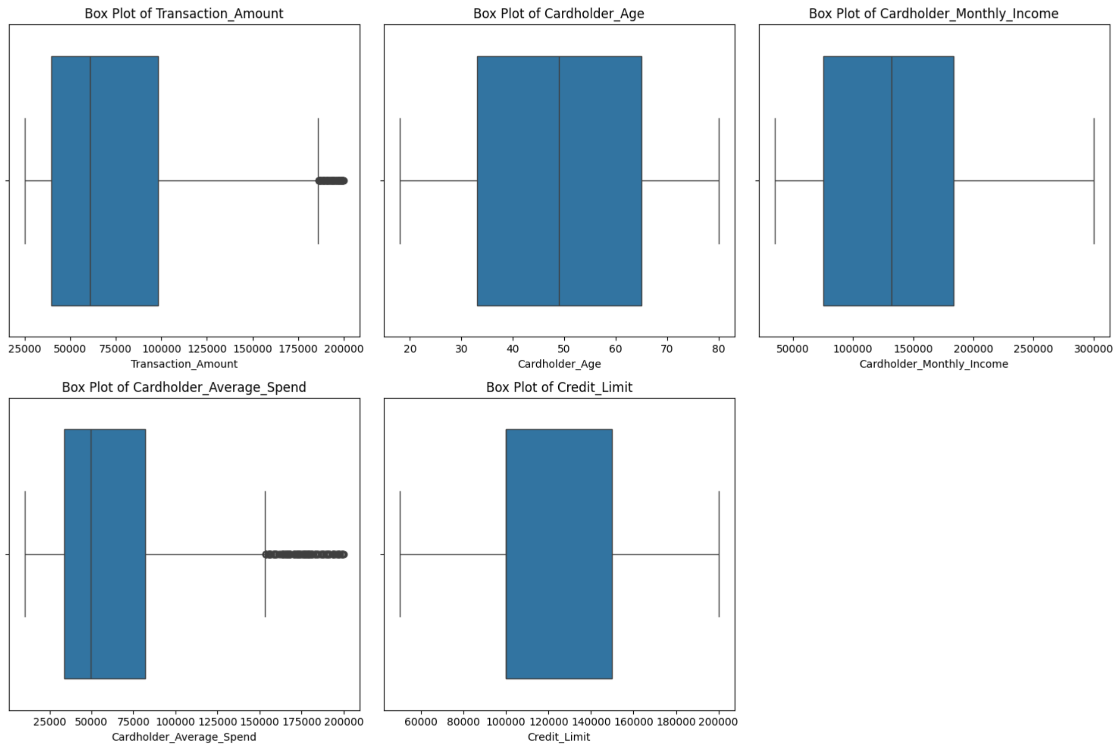
[ ]:
```
df.isna().sum()
```

[ ]:
```
Transaction_ID                0
Card_Type                     0
Merchant_Category             0
Transaction_Amount            0
Transaction_DateTime          0
Location                      0
Region                        0
Cardholder_Age                0
Cardholder_Gender             0
Cardholder_Monthly_Income     0
Cardholder_Average_Spend      0
Credit_Limit                  0
Device_Type                   0
Day_of_Week                   0
Is_Fraudulent                 0
dtype: int64
```

b) Check for outliers in **numerical features** using statistical methods like **Z-score or IQR (Interquartile Range)** and remove them if necessary to ensure data quality.

Remove outliers in numerical features using IQR (Interquartile Range)

[ ]:
```python
# Create box plots for numerical columns
plt.figure(figsize=(15, 10))
for i, col in enumerate(numerical_cols):
    plt.subplot(2, 3, i + 1)  # Adjust the layout as needed
    sns.boxplot(data=df, x=col)
    plt.title(f'Box Plot of {col}')
plt.tight_layout()
plt.show()
```



[ ]:
```
df[['Transaction_Amount', 'Cardholder_Average_Spend']].describe()
```

[ ]:

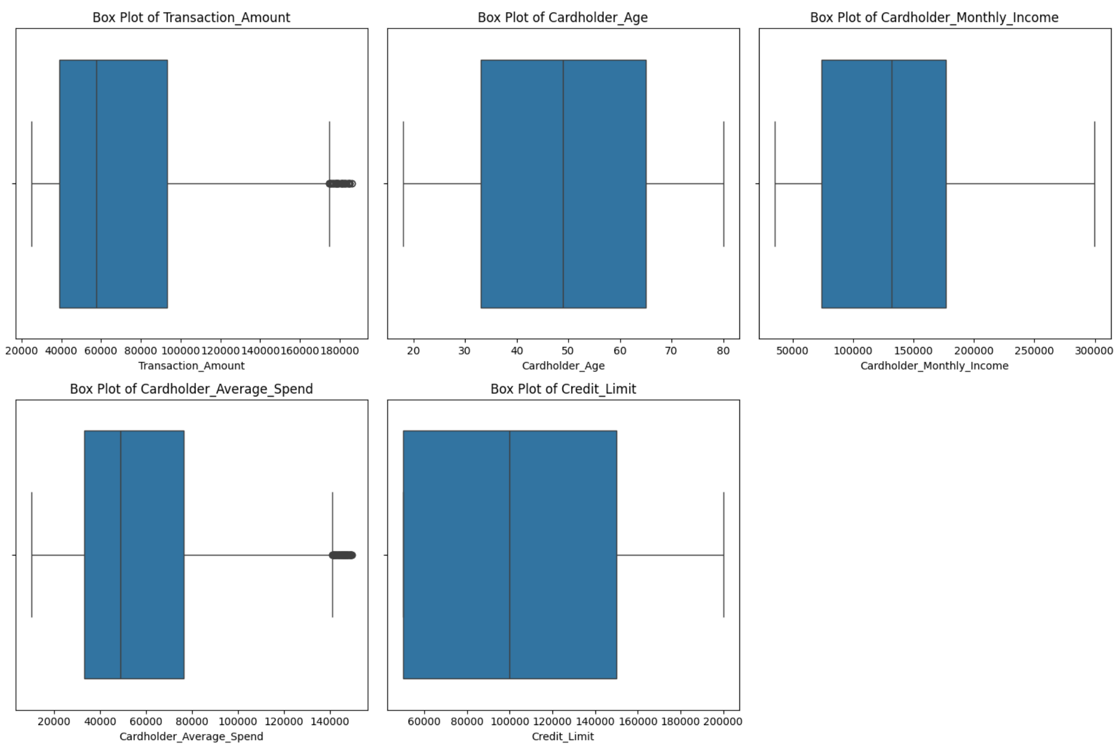
	Transaction_Amount	Cardholder_Average_Spend
count	5000.000000	5000.000000
mean	74651.500800	62496.310986
std	43065.809224	39307.481909
min	25008.000000	10282.410000
25%	39747.000000	33936.937500
50%	60922.000000	49547.945000
75%	98348.750000	81810.222500
max	199923.000000	199898.290000

[ ]:
```
def remove_outliers_iqr(df, col):
  Q1 = df[col].quantile(0.25)
  Q3 = df[col].quantile(0.75)
  IQR = Q3 - Q1
  lower_bound = Q1 - 1.5 * IQR
  upper_bound = Q3 + 1.5 * IQR
  df_filtered = df[(df[col] >= lower_bound) & (df[col] <= upper_bound)]
  return df_filtered

for col in df[['Transaction_Amount', 'Cardholder_Average_Spend']]:
  df = remove_outliers_iqr(df, col)
```

[ ]:
```
df.shape
```

[ ]: (4746, 15)

[ ]:
```
plt.figure(figsize=(15, 10))
for i, col in enumerate(numerical_cols):
  plt.subplot(2, 3, i + 1)  # Adjust the layout as needed
  sns.boxplot(data=df, x=col)
  plt.title(f'Box Plot of {col}')
plt.tight_layout()
plt.show()
```



[ ]:
```
import plotly.figure_factory as ff

hist_data = [df['Transaction_Amount'], df['Cardholder_Average_Spend']]
group_labels = ['Transaction_Amount', 'Cardholder_Average_Spend']

fig = ff.create_distplot(hist_data, group_labels, show_hist=False)
fig.show()
```

c) Assess skewness in numerical features by calculating the skewness score. If any features are highly skewed, consider applying transformations such as **square root or log transformation** to improve their distribution before scaling, if needed.

Square root transformation to treat the skewed data

```
[ ]: print('Skewness Score (after outlier removal)\n')
skewness_series = df[['Transaction_Amount', 'Cardholder_Average_Spend']].skew()
skewness_series.rename('Skewness_Score', inplace=True) # Rename the series
skewness_series
```

```
Skewness Score (after outlier removal)
```

```
[ ]: Transaction_Amount          0.935180
Cardholder_Average_Spend    0.950315
Name: Skewness_Score, dtype: float64
```

```
[ ]: hist_data = [df['Transaction_Amount'].apply(lambda x: x**0.5).tolist(),␣
 ↪df['Cardholder_Average_Spend'].apply(lambda x: x**0.5).tolist()]
group_labels = ['Transaction_Amount', 'Cardholder_Average_Spend']

fig = ff.create_distplot(hist_data, group_labels, show_hist=False)
fig.show()
```

```
[ ]: from scipy.stats import skew

# Calculate skewness for the transformed data
skewness_transformed = pd.Series(skew(hist_data[0]),␣
 ↪index=['Transaction_Amount'])
# Use pandas.concat instead of append
skewness_transformed = pd.concat([skewness_transformed, pd.
 ↪Series(skew(hist_data[1]), index=['Cardholder_Average_Spend'])])

print("Skewness after square root transformation:\n")

# Create a DataFrame from the skewness_transformed Series
skewness_df = pd.DataFrame(skewness_transformed,␣
 ↪columns=['Skewness_Score_Transformed'])
skewness_df
```

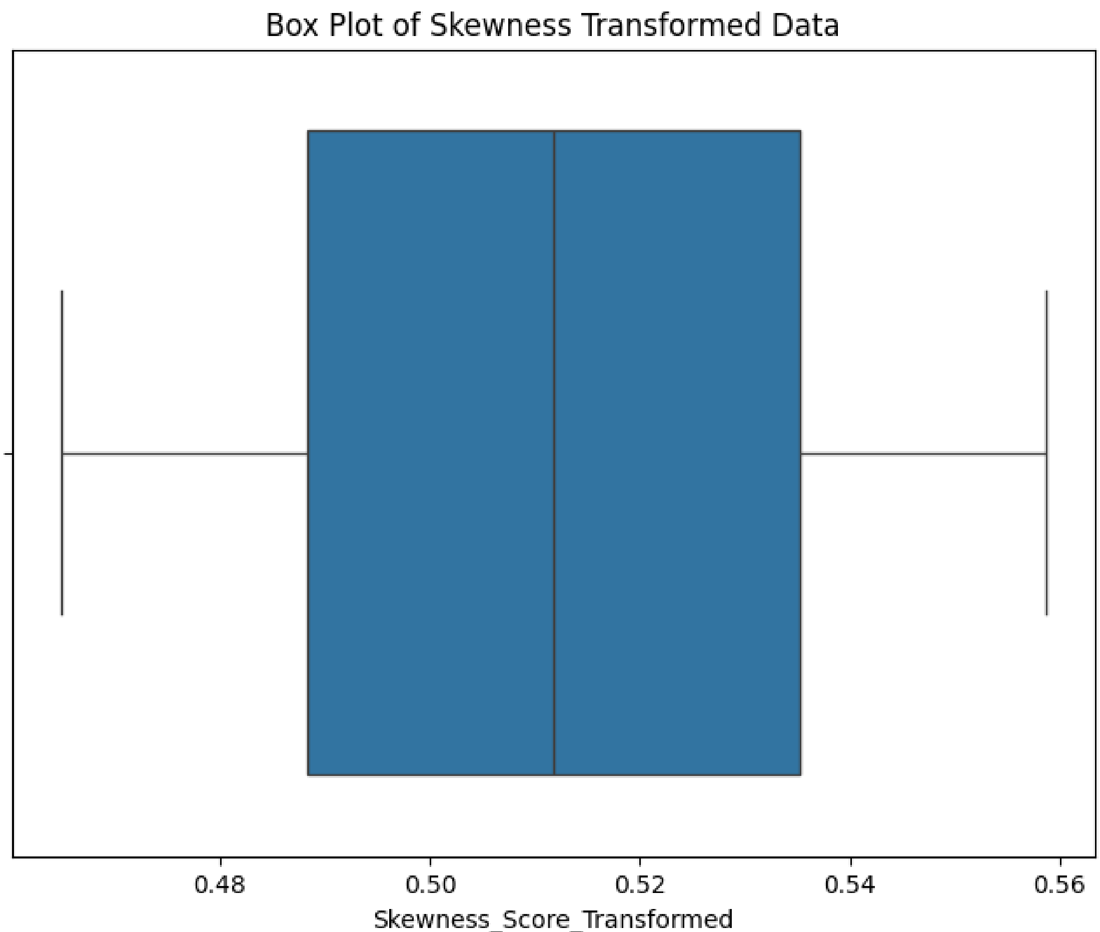
```
Skewness after square root transformation:
```

[ ]:

	Skewness_Score_Transformed
Transaction_Amount	0.558661
Cardholder_Average_Spend	0.464879

```
[ ]: plt.figure(figsize=(8, 6))
sns.boxplot(x=skewness_transformed)
plt.title('Box Plot of Skewness Transformed Data')
plt.xlabel('Skewness_Score_Transformed')
```

```
plt.show()
```



#3) **Feature Engineering: a)** Identify the categorical features in the dataset.

[ ]:
```
df[categorical_cols].info() # the categorical features in the dataset.
```

```
<class 'pandas.core.frame.DataFrame'>
Index: 4746 entries, 0 to 4999
Data columns (total 8 columns):
 #   Column             Non-Null Count  Dtype
---  ------             --------------  -----
 0   Card_Type          4746 non-null   object
 1   Merchant_Category  4746 non-null   object
 2   Location           4746 non-null   object
 3   Region             4746 non-null   object
 4   Cardholder_Gender  4746 non-null   object
 5   Device_Type        4746 non-null   object
 6   Day_of_Week        4746 non-null   object
```

```
 7   Is_Fraudulent      4746 non-null   object
dtypes: object(8)
memory usage: 333.7+ KB
```

b) Encode categorical features to numerical using techniques like one-hot encoding or label encoding techniques to prepare the data for machine learning algorithms.

Label Encoding Technique

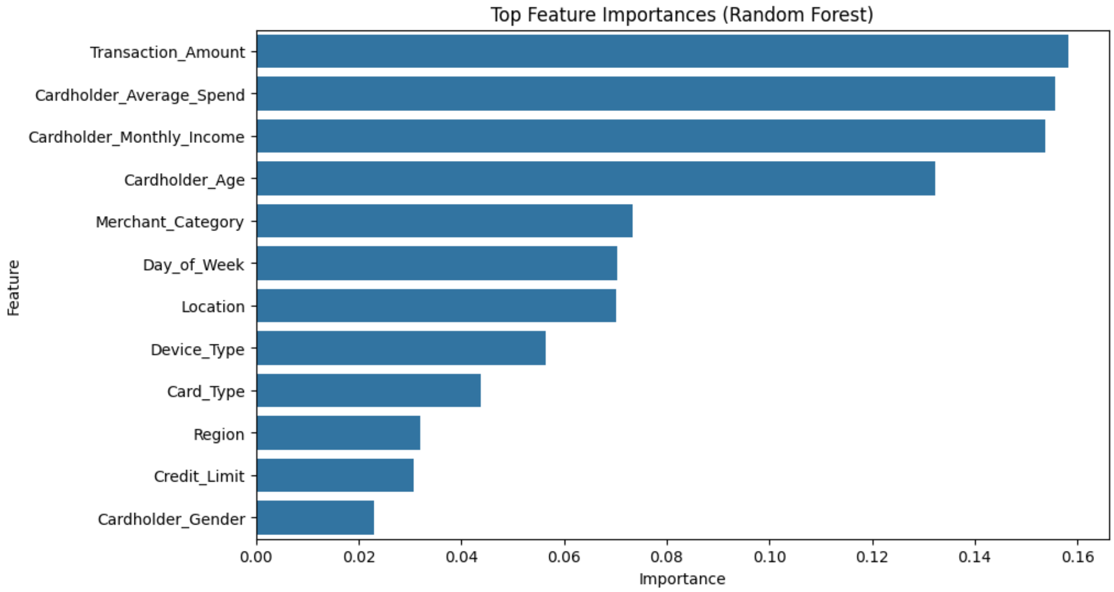
[ ]:
```
from sklearn.preprocessing import LabelEncoder

# Instantiate the LabelEncoder
label_encoders = {col: LabelEncoder() for col in categorical_cols}

# Apply label encoding to each categorical column
for col in categorical_cols:
    df[col] = label_encoders[col].fit_transform(df[col])

df.head()
```

[ ]:
```
  Transaction_ID  Card_Type  Merchant_Category  Transaction_Amount  \
0       W963UK57          1                  7             27214.0
1       V606KV56          0                  5             83956.0
4       K256ZN73          2                  5             81170.0
5       I812SG19          2                  2            131918.0
6       Y182U040          3                  5            139036.0

  Transaction_DateTime  Location  Region  Cardholder_Age  Cardholder_Gender  \
0  2020-01-01 09:43:17        10       0            23.0                  0
1  2020-01-03 16:26:13        12       3            49.0                  1
4  2020-01-04 17:26:47         8       1            37.0                  0
5  2020-01-04 19:55:12         9       3            80.0                  1
6  2020-01-05 16:33:10        12       3            33.0                  1

   Cardholder_Monthly_Income  Cardholder_Average_Spend  Credit_Limit  \
0                    94632.0                  36369.65      100000.0
1                   148118.0                  89179.12      150000.0
4                   174470.0                  52713.09      200000.0
5                   166671.0                  80393.44      150000.0
6                   171991.0                  84215.74      150000.0

   Device_Type  Day_of_Week  Is_Fraudulent
0            4            6              0
1            1            0              0
4            2            2              0
5            3            2              0
6            1            3              1
```

#4) **Feature Selection:** **a)** Select relevant features that have the most impact on predicting fraudulent transactions.

[ ]:
```
# Feature Importance using Random Forest
from sklearn.ensemble import RandomForestClassifier

# Separate features (X) and target variable (y)
X = df.drop(['Transaction_ID','Transaction_DateTime', 'Is_Fraudulent'], axis=1)
y = df['Is_Fraudulent']

# Initialize and train a RandomForestClassifier
rf_classifier = RandomForestClassifier(random_state=42)
rf_classifier.fit(X, y)

# Get feature importances
feature_importances = rf_classifier.feature_importances_

# Create a DataFrame for better visualization
feature_importance_df = pd.DataFrame({'Feature': X.columns, 'Importance':␣
 ↪feature_importances})
feature_importance_df = feature_importance_df.sort_values(by='Importance',␣
 ↪ascending=False)

# Display the top N important features
N = 12
print(feature_importance_df.head(N))

# Visualize feature importances
plt.figure(figsize=(10, 6))
sns.barplot(x='Importance', y='Feature', data=feature_importance_df.head(N))
plt.title('Top Feature Importances (Random Forest)')
plt.xlabel('Importance')
plt.ylabel('Feature')
plt.show()
```

```
                     Feature  Importance
2         Transaction_Amount    0.158237
8     Cardholder_Average_Spend    0.155698
7    Cardholder_Monthly_Income    0.153762
5             Cardholder_Age    0.132412
1          Merchant_Category    0.073389
11               Day_of_Week    0.070344
3                   Location    0.070056
10               Device_Type    0.056362
0                  Card_Type    0.043883
4                     Region    0.031984
9               Credit_Limit    0.030787
6          Cardholder_Gender    0.023085
```



b) Identify and remove redundant or irrelevant features that do not contribute significantly to the prediction task.

[ ]:
```
X.columns # These are my Features X
```

[ ]:
```
Index(['Card_Type', 'Merchant_Category', 'Transaction_Amount', 'Location',
       'Region', 'Cardholder_Age', 'Cardholder_Gender',
       'Cardholder_Monthly_Income', 'Cardholder_Average_Spend', 'Credit_Limit',
       'Device_Type', 'Day_of_Week'],
      dtype='object')
```

By carefully identifying **'Transaction_ID', 'Transaction_DateTime'** are the irrelevant features that do not contribute significantly to the prediction task - **'Is_Fraudulent' (Target - y)**

#5) Split data into training and testing:

a) Divide the dataset into training and testing sets to evaluate the model's performance.

[ ]:
```
from sklearn.model_selection import train_test_split

# 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) # 80% training and 20% test
```

b) Ensure that both sets maintain the same distribution of fraudulent and non-fraudulent transactions to avoid data leakage.

[ ]:
```
# Check the distribution of the target variable in the original dataset
print(df['Is_Fraudulent'].value_counts(normalize=True))

# Use stratify parameter in train_test_split
#X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2,␣
 ↪random_state=42, stratify=y)

# Verify the distribution in the training and testing sets
print("\nTraining set distribution:")
print(y_train.value_counts(normalize=True))
print("\nTesting set distribution:")
print(y_test.value_counts(normalize=True))
```

```
Is_Fraudulent
0    0.733881
1    0.266119
Name: proportion, dtype: float64

Training set distribution:
Is_Fraudulent
0    0.732086
1    0.267914
Name: proportion, dtype: float64

Testing set distribution:
Is_Fraudulent
0    0.741053
1    0.258947
Name: proportion, dtype: float64
```

#6) **Feature Scaling:**

a) Scale numerical features to ensure that they have the same magnitude, preventing some features from dominating others during model training.

b) Common scaling techniques include Min-Max scaling or Standardization (Z-score normalization).

Scaling Techniques - Standardization (Z-score normalization)

[ ]:
```
df[numerical_cols].head()
```

[ ]:
```
   Transaction_Amount  Cardholder_Age  Cardholder_Monthly_Income  \
0             27214.0            23.0                    94632.0
1             83956.0            49.0                   148118.0
4             81170.0            37.0                   174470.0
5            131918.0            80.0                   166671.0
6            139036.0            33.0                   171991.0

   Cardholder_Average_Spend  Credit_Limit
```

```
0                    36369.65      100000.0
1                    89179.12      150000.0
4                    52713.09      200000.0
5                    80393.44      150000.0
6                    84215.74      150000.0
```

[ ]:
```
from sklearn.preprocessing import StandardScaler

# Assuming 'numerical_cols' contains the names of your numerical features
numerical_cols_to_scale = numerical_cols

# Initialize the scaler
scaler = StandardScaler()

# Fit and transform the training data
X_train[numerical_cols_to_scale] = scaler.
 ↪fit_transform(X_train[numerical_cols_to_scale])

# Transform the testing data (using the same scaler fitted on the training data)
X_test[numerical_cols_to_scale] = scaler.
 ↪transform(X_test[numerical_cols_to_scale])
```

[ ]:
```
X_train[numerical_cols_to_scale].head()
```

[ ]:
```
      Transaction_Amount  Cardholder_Age  Cardholder_Monthly_Income  \
2105           -0.459998       -1.559788                   0.042006
1580           -0.366975       -1.504834                   0.000709
2914            0.494112        1.132954                   1.688955
1428            0.759832       -1.669696                  -0.564622
1963           -1.033621       -1.614742                   1.487629

      Cardholder_Average_Spend  Credit_Limit
2105                 -0.131028      0.539524
1580                  0.322019     -0.384262
2914                  0.312686      1.463310
1428                  0.620271     -0.384262
1963                 -1.031694      1.463310
```

[ ]:
```
X_test[numerical_cols_to_scale].head()
```

[ ]:
```
      Transaction_Amount  Cardholder_Age  Cardholder_Monthly_Income  \
1653            0.449958       -0.021078                   1.006224
3327           -0.674770       -0.955295                  -0.096662
572             1.167473       -0.350802                   1.268662
2769           -0.792629        0.033876                  -0.787539
4653            2.369690       -0.350802                   2.499697
```

```
      Cardholder_Average_Spend  Credit_Limit
1653                 -0.240105      1.463310
3327                 -0.001338     -0.384262
572                  -0.240105      1.463310
2769                 -0.719636     -0.384262
4653                  2.162279      1.463310
```

#7) Build the Machine Learning Model:

a) Import the necessary modules and libraries for building and evaluating machine learning models.

```
[ ]: from sklearn.linear_model import LogisticRegression
from sklearn.naive_bayes import GaussianNB
from sklearn.tree import DecisionTreeClassifier
from sklearn.ensemble import RandomForestClassifier
from sklearn.neighbors import KNeighborsClassifier
from sklearn.svm import SVC
from sklearn.metrics import accuracy_score, f1_score, confusion_matrix,␣
 ↪classification_report, roc_curve, auc

import warnings

warnings.filterwarnings("ignore")
```

b) Define a list or **dictionary of classifiers** to be evaluated; including **Logistic Regression, Naive Bayes, Decision Tree, Random Forest, K-Nearest Neighbors, and SVM.** Then, compute the **accuracy score and F1-score** for each **classifier.**

```
[ ]: # Dictionary of classifiers
classifiers = {
    'Logistic Regression': LogisticRegression(),
    'Gaussian Naive Bayes': GaussianNB(),
    'Decision Tree': DecisionTreeClassifier(),
    'Random Forest': RandomForestClassifier(),
    'K-Nearest Neighbors': KNeighborsClassifier(),
    'Support Vector Classifier': SVC()
}

# Initialize an empty dictionary to store the results
results = {}

# Iterate through classifiers
for name, clf in classifiers.items():
  clf.fit(X_train, y_train)
  y_pred = clf.predict(X_test)
  # Calculate metrics
  accuracy = accuracy_score(y_test, y_pred)
  f1 = f1_score(y_test, y_pred)
```

```
    # Store the results
    results[name] = {'Accuracy': accuracy, 'F1 Score': f1}

# Convert the results dictionary to a DataFrame
results_df = pd.DataFrame(results).T
results_df
```

[ ]:

	Accuracy	F1 Score
Logistic Regression	0.741053	0.000000
Gaussian Naive Bayes	0.741053	0.000000
Decision Tree	0.597895	0.253906
Random Forest	0.736842	0.015748
K-Nearest Neighbors	0.680000	0.182796
Support Vector Classifier	0.741053	0.000000

[ ]:

```
# Find the classifier with the highest accuracy
best_classifier_accuracy = results_df['Accuracy'].idxmax()
print(f"The best classifier based on accuracy is: {best_classifier_accuracy}␣
 ↪with the highest accuracy is {round(results_df.loc[best_classifier_accuracy,␣
 ↪'Accuracy'], 6)}")

# Find the classifier with the highest F1-score
best_classifier = results_df['F1 Score'].idxmax()
print(f"\nThe best classifier based on F1-score is: {best_classifier} with the␣
 ↪highest F1-score is {round(results_df.loc[best_classifier, 'F1 Score'], 6)}")
```

```
The best classifier based on accuracy is: Logistic Regression with the highest
accuracy is 0.741053

The best classifier based on F1-score is: Decision Tree with the highest
F1-score is 0.253906
```

c) Select a machine learning algorithm for binary classification with the highest accuracy or F1-score from the above step.

Binary Classification - Logistic Regression with the highest accuracy

[ ]:

```
clf = LogisticRegression(max_iter=500)
clf.fit(X_train, y_train)

y_pred = clf.predict(X_test)
```

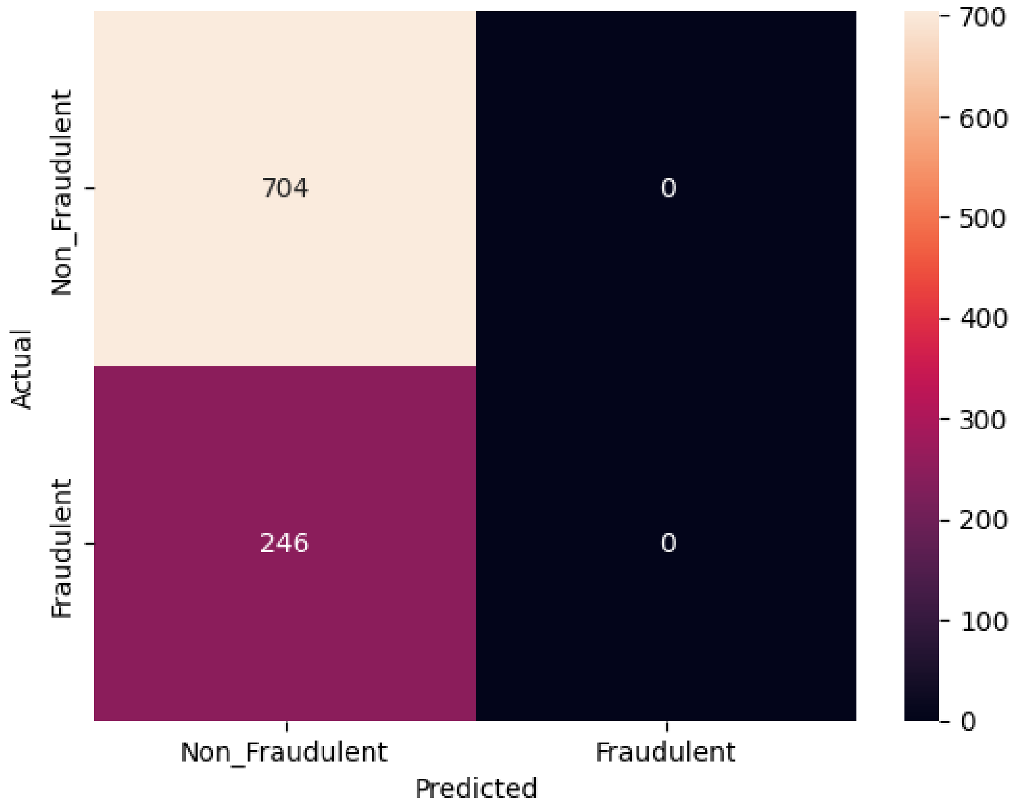
d) Train the selected model using the training dataset and evaluate its performance using appropriate metrics like **confusion matrix, accuracy, precision, recall, and F1-score.**

[ ]:

```
# Confusion Matrix
cm = confusion_matrix(y_test, y_pred)
print("Confusion Matrix:\n", cm)
```

```python
labels = ['Non_Fraudulent', 'Fraudulent']
sns.heatmap(cm, annot=True, fmt='d', xticklabels=labels, yticklabels=labels)
plt.xlabel('Predicted')
plt.ylabel('Actual')
plt.show()

# Classification Report (includes accuracy, precision, recall, F1-score)
print("\nClassification Report:\n", classification_report(y_test, y_pred))
```

```
Confusion Matrix:
 [[704   0]
 [246   0]]
```




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

           0       0.74      1.00      0.85       704
           1       0.00      0.00      0.00       246

    accuracy                           0.74       950
```

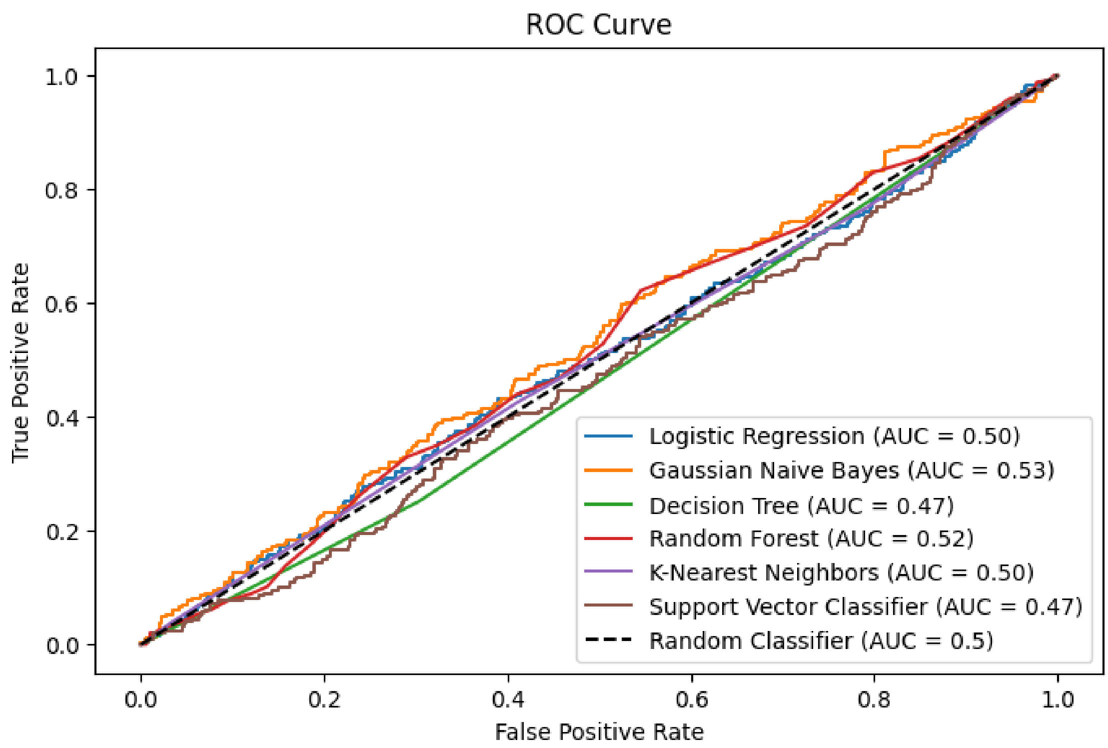
```
   macro avg       0.37      0.50      0.43       950
weighted avg       0.55      0.74      0.63       950
```

[ ]:
```
from sklearn.model_selection import KFold, cross_val_score

# K-fold cross-validation
k = 5  # Number of folds
kf = KFold(n_splits=k, shuffle=True, random_state=4)

# Print header
print(f"{'Classifier':<25} {'Mean Accuracy':<20} {'Mean F1 Score':<20}\n")

# Iterate through classifiers and perform cross-validation
for name, clf in classifiers.items():
    accuracy_scores = cross_val_score(clf, X, y, cv=kf, scoring='accuracy')
    f1_scores = cross_val_score(clf, X, y, cv=kf, scoring='f1_weighted')
    print(f"{name:<25} {accuracy_scores.mean():<20.4f} {f1_scores.mean():<20.
↪4f}")
```

```
Classifier                Mean Accuracy        Mean F1 Score

Logistic Regression       0.7339               0.6213
Gaussian Naive Bayes      0.7339               0.6213
Decision Tree             0.5995               0.6076
Random Forest             0.7318               0.6237
K-Nearest Neighbors       0.6810               0.6344
Support Vector Classifier 0.7339               0.6213
```

e) Validate the model's performance on the testing dataset and interpret the results to assess its effectiveness in detecting fraudulent transactions.

[ ]:
```
plt.figure(figsize=(8, 5))

for name, clf in classifiers.items():
    clf.fit(X_train, y_train)
    y_probs = clf.predict_proba(X_test)[:, 1] if hasattr(clf, "predict_proba")␣
↪else clf.decision_function(X_test)
    fpr, tpr, _ = roc_curve(y_test, y_probs)
    plt.plot(fpr, tpr, label=f'{name} (AUC = {auc(fpr, tpr):.2f})')

plt.plot([0, 1], [0, 1], linestyle='--', color='black', label='Random␣
↪Classifier (AUC = 0.5)') # Plot diagonal line (random model)
plt.title('ROC Curve')
plt.xlabel('False Positive Rate')
plt.ylabel('True Positive Rate')
plt.legend(loc='lower right')
plt.show()
```



#Model Performance Analysis: Credit Card Fraud Detection

0.1 1. Performance Overview

0.1.1 Accuracy:

- Accuracy values (e.g., **73.39% for Logistic Regression, Random Forest**) show the proportion of total correct predictions.
- **Limitation:** In imbalanced datasets, accuracy is unreliable because the majority class (non-fraudulent) dominates predictions.

0.1.2 F1-Score:

- Most models have **F1-scores close to 0** (e.g., **0 for Logistic Regression and Support Vector Classifier**), indicating that the models fail to balance precision and recall for fraudulent transactions.

0.1.3 Confusion Matrix:

- **Non-Fraudulent Transactions (704):** Perfectly classified (all true positives).
- **Fraudulent Transactions (246):** Completely missed (all false negatives).

0.1.4 Classification Report:

- **Precision for Fraudulent Class (1): 0.00** — Models fail to correctly predict any fraudulent transactions.
- **Recall for Fraudulent Class (1): 0.00** — None of the actual fraud cases are detected.
- **Macro Average F1-Score (0.43)** and **Weighted Average F1-Score (0.63)** reflect severe imbalances in prediction.

0.1.5 AUC-ROC:

- AUC scores for most classifiers hover around **0.5**, which is equivalent to random guessing. This confirms that the models are ineffective at distinguishing fraud from non-fraud cases.

0.2 2. Key Observations

1. **Class Imbalance Problem:**
   - The models are biased towards the majority class (non-fraudulent) and fail to generalize for the minority class (fraudulent).
   - Fraudulent transactions have low support (246 cases), leading to poor detection.
2. **Precision-Recall Trade-Off:**
   - Classifiers prioritize maximizing accuracy by predicting the majority class, neglecting the minority class.
   - **F1-score of 0** indicates that none of the models achieve a balance between precision and recall for fraud detection.
3. **Model Limitation:**
   - Without addressing class imbalance and tuning decision thresholds, the models' performance remains inadequate.