# Analysis of SyriaTel performance in the Telecommunication Industry

# Business Understanding

The telecommunication industry is faced with one of the fiercest competitions globally. Customers are in need of the cheapest, reliable and safe communication platforms.This study focuses on SyriaTel, a telecommunications company in Syria.Among the challenges facing this company include;Intense Competition,Service Quality Issues (Network Coverage and Reliability),Economic and Political Instability, Changing Customer Expectations,Pricing and Plan Flexibility,Customer Satisfaction and Perception,Regulatory Environment (Government Regulations),Inability to Predict Churn Patterns (Data Analysis Challenges and Lack of Insight into Customer Behavior. This study attempts to guide the mangement of SyriaTel on what areas to improve on in order to bring the company back to profitability.

# Business Problem

Syria Tel intends to turnaround their profitability. The management wants to esbablish roote causes of the challenges and how to address them. The business environment is competetive and the country is rocked with civil wars. The company is hopeful to navigate all these with a proper data analysis and recommendation. This study therefore focusses on customer behaviour with relation to the cost of call and messages, the duration of call and whether the costs should vary between days and nights.

# Data sources

SyriaTel Customer Churn Provides detailed data on various aspects of analysis including; account length, area code,phone number, international plan, voice mail plan,number of vmail messages, total day minutes, total day calls, total day charge, total eve calls, total eve charge, total night minutes, total night calls, total night charge and so on.

# Objectives

The objective of this study is to guide SyriaTel, based on analysis of the above data, how to respond to the changing market and political landscape in Syria.

# Data Understanding

In [35]:
```
# Importing libraries
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
import warnings
from sklearn.linear_model import LogisticRegression
from sklearn.ensemble import RandomForestClassifier
from sklearn.svm import SVC
from sklearn.metrics import accuracy_score, precision_score, recall_score, f1_score, roc_auc_score, confusion_matrix
from sklearn.model_selection import cross_val_score
from sklearn.metrics import roc_curve, auc


warnings.filterwarnings('ignore')
```

In [36]:
```
df= pd.read_csv('archive (1).zip')
df
```

Out[36]:

| | state | account length | area code | phone number | international plan | voice mail plan | number vmail messages | total day minutes | total day calls | total day charge | ... | total eve calls | total eve charge | total night minutes | tota nigh call |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **0** | KS | 128 | 415 | 382-4657 | no | yes | 25 | 265.1 | 110 | 45.07 | ... | 99 | 16.78 | 244.7 | 91 |
| **1** | OH | 107 | 415 | 371-7191 | no | yes | 26 | 161.6 | 123 | 27.47 | ... | 103 | 16.62 | 254.4 | 103 |
| **2** | NJ | 137 | 415 | 358-1921 | no | no | 0 | 243.4 | 114 | 41.38 | ... | 110 | 10.30 | 162.6 | 104 |
| **3** | OH | 84 | 408 | 375-9999 | yes | no | 0 | 299.4 | 71 | 50.90 | ... | 88 | 5.26 | 196.9 | 89 |
| **4** | OK | 75 | 415 | 330-6626 | yes | no | 0 | 166.7 | 113 | 28.34 | ... | 122 | 12.61 | 186.9 | 121 |
| **...** | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **3328** | AZ | 192 | 415 | 414-4276 | no | yes | 36 | 156.2 | 77 | 26.55 | ... | 126 | 18.32 | 279.1 | 83 |
| **3329** | WV | 68 | 415 | 370-3271 | no | no | 0 | 231.1 | 57 | 39.29 | ... | 55 | 13.04 | 191.3 | 123 |
| **3330** | RI | 28 | 510 | 328-8230 | no | no | 0 | 180.8 | 109 | 30.74 | ... | 58 | 24.55 | 191.9 | 91 |
| **3331** | CT | 184 | 510 | 364-6381 | yes | no | 0 | 213.8 | 105 | 36.35 | ... | 84 | 13.57 | 139.2 | 137 |
| **3332** | TN | 74 | 415 | 400-4344 | no | yes | 25 | 234.4 | 113 | 39.85 | ... | 82 | 22.60 | 241.4 | 77 |

3333 rows × 21 columns

In [37]:

```
df.head
```

Out[37]:

```
<bound method NDFrame.head of      state  account length  area code phone number international plan  \
0       KS             128        415     382-4657                 no   
1       OH             107        415     371-7191                 no   
2       NJ             137        415     358-1921                 no   
3       OH              84        408     375-9999                yes   
4       OK              75        415     330-6626                yes   
...    ...             ...        ...          ...                ...   
3328    AZ             192        415     414-4276                 no   
3329    WV              68        415     370-3271                 no   
3330    RI              28        510     328-8230                 no   
3331    CT             184        510     364-6381                yes   
3332    TN              74        415     400-4344                 no   

     voice mail plan  number vmail messages  total day minutes  \
0                yes                     25              265.1   
1                yes                     26              161.6   
2                 no                      0              243.4   
3                 no                      0              299.4   
4                 no                      0              166.7   
...              ...                    ...                ...   
3328             yes                     36              156.2   
3329              no                      0              231.1   
3330              no                      0              180.8   
3331              no                      0              213.8   
3332             yes                     25              234.4   

      total day calls  total day charge  ...  total eve calls  \
0                 110             45.07  ...               99   
1                 123             27.47  ...              103   
2                 114             41.38  ...              110   
3                  71             50.90  ...               88   
4                 113             28.34  ...              122   
...               ...               ...  ...              ...   
3328               77             26.55  ...              126   
3329               57             39.29  ...               55   
3330              109             30.74  ...               58   
3331              105             36.35  ...               84   
3332              113             39.85  ...               82   

      total eve charge  total night minutes  total night calls  \
0                16.78                244.7                 91   
1                16.62                254.4                103   
```

```
2               10.30               162.6               104
3                5.26               196.9                89
4               12.61               186.9               121
...               ...                 ...               ...
3328            18.32               279.1                83
3329            13.04               191.3               123
3330            24.55               191.9                91
3331            13.57               139.2               137
3332            22.60               241.4                77

      total night charge  total intl minutes  total intl calls  \
0                  11.01                10.0                 3
1                  11.45                13.7                 3
2                   7.32                12.2                 5
3                   8.86                 6.6                 7
4                   8.41                10.1                 3
...                  ...                 ...               ...
3328               12.56                 9.9                 6
3329                8.61                 9.6                 4
3330                8.64                14.1                 6
3331                6.26                 5.0                10
3332               10.86                13.7                 4

      total intl charge  customer service calls  churn
0                  2.70                       1  False
1                  3.70                       1  False
2                  3.29                       0  False
3                  1.78                       2  False
4                  2.73                       3  False
...                 ...                     ...    ...
3328               2.67                       2  False
3329               2.59                       3  False
3330               3.81                       2  False
3331               1.35                       2  False
3332               3.70                       0  False

[3333 rows x 21 columns]>
```

In [38]:
```
df.describe()
```

Out[38]:

| | account length | area code | number vmail messages | total day minutes | total day calls | total day charge | total eve minutes | total eve calls | total eve charge | t |
|---|---|---|---|---|---|---|---|---|---|---|
| **count** | 3333.000000 | 3333.000000 | 3333.000000 | 3333.000000 | 3333.000000 | 3333.000000 | 3333.000000 | 3333.000000 | 3333.000000 | 33 |
| **mean** | 101.064806 | 437.182418 | 8.099010 | 179.775098 | 100.435644 | 30.562307 | 200.980348 | 100.114311 | 17.083540 | 2 |
| **std** | 39.822106 | 42.371290 | 13.688365 | 54.467389 | 20.069084 | 9.259435 | 50.713844 | 19.922625 | 4.310668 | |
| **min** | 1.000000 | 408.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | |
| **25%** | 74.000000 | 408.000000 | 0.000000 | 143.700000 | 87.000000 | 24.430000 | 166.600000 | 87.000000 | 14.160000 | 1 |
| **50%** | 101.000000 | 415.000000 | 0.000000 | 179.400000 | 101.000000 | 30.500000 | 201.400000 | 100.000000 | 17.120000 | 2 |
| **75%** | 127.000000 | 510.000000 | 20.000000 | 216.400000 | 114.000000 | 36.790000 | 235.300000 | 114.000000 | 20.000000 | 2 |
| **max** | 243.000000 | 510.000000 | 51.000000 | 350.800000 | 165.000000 | 59.640000 | 363.700000 | 170.000000 | 30.910000 | 3 |

In [39]:

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 3333 entries, 0 to 3332
Data columns (total 21 columns):
 #   Column                  Non-Null Count  Dtype  
---  ------                  --------------  -----  
 0   state                   3333 non-null   object 
 1   account length          3333 non-null   int64  
 2   area code               3333 non-null   int64  
 3   phone number            3333 non-null   object 
 4   international plan      3333 non-null   object 
 5   voice mail plan         3333 non-null   object 
 6   number vmail messages   3333 non-null   int64  
 7   total day minutes       3333 non-null   float64
 8   total day calls         3333 non-null   int64  
 9   total day charge        3333 non-null   float64
 10  total eve minutes       3333 non-null   float64
 11  total eve calls         3333 non-null   int64  
 12  total eve charge        3333 non-null   float64
 13  total night minutes     3333 non-null   float64
 14  total night calls       3333 non-null   int64  
 15  total night charge      3333 non-null   float64
 16  total intl minutes      3333 non-null   float64
 17  total intl calls        3333 non-null   int64  
 18  total intl charge       3333 non-null   float64
 19  customer service calls  3333 non-null   int64  
 20  churn                   3333 non-null   bool   
dtypes: bool(1), float64(8), int64(8), object(4)
memory usage: 524.2+ KB
```

# Data cleaning

Handling NAs

In [40]:
```
# CHeck NAs
df.isna().mean()*100
```

Out[40]:
```
state                     0.0
account length            0.0
area code                 0.0
phone number              0.0
international plan        0.0
voice mail plan           0.0
number vmail messages     0.0
total day minutes         0.0
total day calls           0.0
total day charge          0.0
total eve minutes         0.0
total eve calls           0.0
total eve charge          0.0
total night minutes       0.0
total night calls         0.0
total night charge        0.0
total intl minutes        0.0
total intl calls          0.0
total intl charge         0.0
customer service calls    0.0
churn                     0.0
dtype: float64
```

In [41]:
```
# Drop NAs
df.dropna(inplace =True)
df.isna().sum()
```

Out[41]:
```
state                     0
account length            0
area code                 0
phone number              0
international plan        0
voice mail plan           0
number vmail messages     0
total day minutes         0
total day calls           0
total day charge          0
total eve minutes         0
total eve calls           0
total eve charge          0
total night minutes       0
total night calls         0
total night charge        0
total intl minutes        0
total intl calls          0
total intl charge         0
customer service calls    0
churn                     0
dtype: int64
```

Handling duplicates

In [42]:
```
df[df.duplicated()].count()
```

Out[42]:
```
state                     0
account length            0
area code                 0
phone number              0
international plan        0
voice mail plan           0
number vmail messages     0
total day minutes         0
total day calls           0
total day charge          0
total eve minutes         0
total eve calls           0
total eve charge          0
total night minutes       0
total night calls         0
total night charge        0
total intl minutes        0
total intl calls          0
total intl charge         0
customer service calls    0
churn                     0
dtype: int64
```

In [43]:
```
df.drop_duplicates(inplace = True)
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 3333 entries, 0 to 3332
Data columns (total 21 columns):
 #   Column                  Non-Null Count  Dtype  
---  ------                  --------------  -----  
 0   state                   3333 non-null   object 
 1   account length          3333 non-null   int64  
 2   area code               3333 non-null   int64  
 3   phone number            3333 non-null   object 
 4   international plan      3333 non-null   object 
 5   voice mail plan         3333 non-null   object 
 6   number vmail messages   3333 non-null   int64  
 7   total day minutes       3333 non-null   float64
 8   total day calls         3333 non-null   int64  
 9   total day charge        3333 non-null   float64
 10  total eve minutes       3333 non-null   float64
 11  total eve calls         3333 non-null   int64  
 12  total eve charge        3333 non-null   float64
 13  total night minutes     3333 non-null   float64
 14  total night calls       3333 non-null   int64  
 15  total night charge      3333 non-null   float64
 16  total intl minutes      3333 non-null   float64
 17  total intl calls        3333 non-null   int64  
 18  total intl charge       3333 non-null   float64
 19  customer service calls  3333 non-null   int64  
 20  churn                   3333 non-null   bool   
dtypes: bool(1), float64(8), int64(8), object(4)
memory usage: 524.2+ KB
```

In [44]:

```
df[df.duplicated(subset='area code')].count()
```

Out[44]:
```
state                     3330
account length            3330
area code                 3330
phone number              3330
international plan        3330
voice mail plan           3330
number vmail messages     3330
total day minutes         3330
total day calls           3330
total day charge          3330
total eve minutes         3330
total eve calls           3330
total eve charge          3330
total night minutes       3330
total night calls         3330
total night charge        3330
total intl minutes        3330
total intl calls          3330
total intl charge         3330
customer service calls    3330
churn                     3330
dtype: int64
```

In [45]:
```
for i in df.columns:
  print(f' Unique values for {i}')
  print(f' N-unique values for {i} is {df[i].nunique()}')
  print(list(df[i].unique())) # sort to identify duplicates within column
  print('')
```

```
 Unique values for state
 N-unique values for state is 51
['KS', 'OH', 'NJ', 'OK', 'AL', 'MA', 'MO', 'LA', 'WV', 'IN', 'RI', 'IA', 'MT', 'NY', 'ID', 'VT', 'VA', 'TX', 'FL', 'C
O', 'AZ', 'SC', 'NE', 'WY', 'HI', 'IL', 'NH', 'GA', 'AK', 'MD', 'AR', 'WI', 'OR', 'MI', 'DE', 'UT', 'CA', 'MN', 'SD',
'NC', 'WA', 'NM', 'NV', 'DC', 'KY', 'ME', 'MS', 'TN', 'PA', 'CT', 'ND']

 Unique values for account length
 N-unique values for account length is 212
[128, 107, 137, 84, 75, 118, 121, 147, 117, 141, 65, 74, 168, 95, 62, 161, 85, 93, 76, 73, 77, 130, 111, 132, 174, 57
, 54, 20, 49, 142, 172, 12, 72, 36, 78, 136, 149, 98, 135, 34, 160, 64, 59, 119, 97, 52, 60, 10, 96, 87, 81, 68, 125,
116, 38, 40, 43, 113, 126, 150, 138, 162, 90, 50, 82, 144, 46, 70, 55, 106, 94, 155, 80, 104, 99, 120, 108, 122, 157,
103, 63, 112, 41, 193, 61, 92, 131, 163, 91, 127, 110, 140, 83, 145, 56, 151, 139, 6, 115, 146, 185, 148, 32, 25, 179
, 67, 19, 170, 164, 51, 208, 53, 105, 66, 86, 35, 88, 123, 45, 100, 215, 22, 33, 114, 24, 101, 143, 48, 71, 167, 89,
199, 166, 158, 196, 209, 16, 39, 173, 129, 44, 79, 31, 124, 37, 159, 194, 154, 21, 133, 224, 58, 11, 109, 102, 165, 1
8, 30, 176, 47, 190, 152, 26, 69, 186, 171, 28, 153, 169, 13, 27, 3, 42, 189, 156, 134, 243, 23, 1, 205, 200, 5, 9, 1
78, 181, 182, 217, 177, 210, 29, 180, 2, 17, 7, 212, 232, 192, 195, 197, 225, 184, 191, 201, 15, 183, 202, 8, 175, 4,
188, 204, 221]

 Unique values for area code
 N-unique values for area code is 3
[415, 408, 510]

 Unique values for phone number
 N-unique values for phone number is 3333
['382-4657', '371-7191', '358-1921', '375-9999', '330-6626', '391-8027', '355-9993', '329-9001', '335-4719', '330-817
3', '329-6603', '344-9403', '363-1107', '394-8006', '366-9238', '351-7269', '350-8884', '386-2923', '356-2992', '37
3-2782', '396-5800', '393-7984', '358-1958', '350-2565', '343-4696', '331-3698', '357-3817', '418-6412', '353-2630',
'410-7789', '416-8428', '370-3359', '383-1121', '360-1596', '395-2854', '362-1407', '341-9764', '353-3305', '402-138
1', '332-9891', '372-9976', '383-6029', '353-7289', '390-7274', '352-1237', '353-3061', '363-5450', '364-1995', '39
8-1294', '405-7146', '413-4957', '420-5645', '349-4396', '404-3211', '353-3759', '363-5947', '340-5121', '370-7574',
'403-9733', '355-7251', '359-5893', '405-3371', '344-5117', '332-8160', '359-4081', '352-8305', '329-9847', '365-901
1', '338-9472', '374-8042', '359-1231', '413-7170', '415-2935', '399-4246', '362-5889', '350-8921', '374-5353', '36
0-1171', '355-8887', '333-1967', '354-4577', '331-7425', '419-2637', '411-1530', '395-3026', '388-6441', '402-1251',
'412-9997', '346-7302', '358-9095', '400-9770', '334-1275', '340-4953', '400-9510', '387-6103', '366-4467', '370-345
0', '327-3954', '355-6291', '362-9748', '379-6506', '347-7741', '354-3783', '401-7594', '397-4976', '334-2577', '40
0-3637', '383-4361', '371-4306', '403-4298', '409-3786', '337-4697', '383-1509', '359-9794', '407-7035', '363-1069',
'391-4652', '355-6837', '409-1244', '328-3266', '352-7072', '370-7550', '369-5526', '329-4391', '408-4195', '354-444
5', '335-4858', '414-8718', '409-5939', '331-4902', '353-6870', '355-2909', '390-6101', '400-3446', '411-5859', '38
7-2919', '374-8525', '379-5592', '345-8237', '422-6690', '346-2359', '374-3534', '381-4756', '390-2805', '390-2390',
'419-9097', '386-7281', '380-3561', '390-8760', '366-6730', '395-5285', '354-3436', '336-7600', '383-6293', '362-459
6', '401-3926', '370-9116', '328-6289', '350-9994', '351-4616', '360-5779', '417-4885', '406-4710', '409-8743', '33
5-4584', '361-9845', '366-5699', '329-9364', '390-7434', '404-9680', '338-9398', '394-2445', '381-2709', '397-5060',
```

'415-2393', '377-1765', '409-2111', '401-3170', '405-5681', '411-4582', '355-5009', '372-3750', '405-2888', '361-333
7', '350-1639', '333-3221', '422-1471', '399-7865', '373-4819', '338-6981', '418-4365', '359-5461', '375-3586', '40
7-8376', '408-6496', '385-7688', '332-6934', '378-3625', '353-7292', '399-6786', '358-3261', '377-9932', '397-4030',
'367-1062', '341-8467', '339-9453', '344-3388', '375-8013', '408-4142', '386-3671', '411-2284', '346-7795', '333-560
9', '405-1842', '366-6345', '337-9345', '328-6770', '380-7321', '375-1476', '356-1567', '422-6685', '336-1090', '34
3-2095', '345-3934', '338-8050', '388-9568', '402-6591', '403-6419', '386-9790', '378-5692', '360-3324', '410-3719',
'352-4221', '327-6179', '359-6196', '374-9107', '357-4078', '366-5780', '393-9619', '355-9295', '400-5751', '338-102
7', '405-8867', '336-5616', '335-1697', '331-5138', '385-8240', '348-1359', '354-7339', '349-1687', '380-2558', '36
5-2153', '345-6043', '349-2808', '411-1715', '385-2488', '377-7177', '342-1099', '386-4170', '413-1269', '396-4460',
'334-2730', '340-3182', '377-8608', '417-3676', '417-6774', '411-9554', '420-3192', '389-1475', '343-7734', '410-339
0', '344-6495', '331-6229', '337-7501', '339-9631', '369-4384', '416-3915', '339-3049', '361-7998', '355-4842', '38
7-6440', '369-2625', '389-7073', '370-8463', '362-7318', '412-1194', '355-9508', '352-8202', '335-5882', '352-6976',
'393-6733', '335-1838', '355-6930', '387-5860', '343-2605', '350-6759', '371-1514', '346-9317', '398-4313', '412-439
9', '330-1835', '416-1676', '329-7347', '360-6868', '405-6641', '393-2373', '419-1714', '336-3819', '341-3464', '41
3-5310', '366-7912', '399-8845', '368-2583', '360-6309', '359-5890', '332-2462', '381-9196', '329-3222', '363-5819',
'413-9269', '330-7483', '403-7775', '360-2479', '394-3791', '384-2632', '359-8466', '331-8909', '359-5160', '330-983
3', '362-2314', '338-8478', '387-5453', '380-3437', '365-8779', '407-2750', '396-8265', '397-4304', '333-2611', '40
9-8814', '336-5406', '343-6940', '361-9923', '350-6639', '376-4300', '349-6567', '333-7749', '408-6089', '375-2165',
'400-6999', '420-7823', '366-5241', '413-3412', '406-2752', '337-8078', '402-1942', '371-7917', '343-6374', '385-873
0', '393-7892', '407-6748', '341-4463', '351-2587', '421-9752', '356-4001', '328-9869', '343-5709', '334-1872', '35
0-1040', '369-3214', '385-6778', '383-7689', '385-5722', '357-1909', '364-3567', '422-4241', '370-2957', '329-6562',
'363-3515', '374-7787', '345-2931', '373-5732', '348-7437', '332-9460', '355-6531', '336-9390', '346-8581', '363-882
4', '353-3351', '360-4320', '417-6252', '393-4949', '401-3156', '338-6283', '352-9017', '405-5305', '376-9249', '33
9-7139', '328-6011', '378-1303', '402-5155', '333-5430', '365-9696', '410-4023', '411-7649', '338-4065', '421-9401',
'343-9658', '332-5521', '349-4369', '351-4288', '422-5874', '396-2324', '416-5662', '363-9663', '410-9477', '352-441
8', '361-6563', '417-4404', '372-8048', '356-3646', '351-9604', '355-9581', '396-5189', '356-9187', '394-5537', '40
8-2712', '404-4486', '355-1113', '411-4674', '376-4519', '365-5979', '382-2879', '420-1383', '411-7390', '383-8848',
'387-9301', '399-3164', '385-8997', '352-6573', '408-3384', '419-6033', '336-2090', '343-7242', '376-1713', '381-587
8', '390-5470', '414-4803', '382-5478', '333-7637', '341-1647', '411-4232', '339-2616', '327-3850', '328-7209', '40
5-6189', '418-6737', '366-2212', '356-1420', '343-1323', '361-8239', '384-1621', '360-3525', '392-3813', '337-6898',
'366-8036', '352-8327', '334-9505', '336-5702', '392-2381', '369-6880', '416-8697', '345-3451', '379-2514', '418-665
1', '421-3528', '329-9046', '406-3890', '403-8904', '393-4086', '400-1367', '377-9473', '396-3068', '331-9293', '34
7-1914', '395-1962', '401-5485', '355-6560', '363-3911', '345-1998', '361-5277', '376-7145', '375-2975', '376-8573',
'366-7360', '347-7898', '390-7328', '356-5491', '373-3251', '343-1965', '378-8019', '386-1548', '397-1649', '366-724
7', '402-9691', '334-9806', '378-7733', '407-2248', '405-3916', '407-2081', '397-9148', '415-4857', '354-7314', '34
6-5611', '349-4703', '411-7778', '421-1469', '420-5990', '389-4780', '357-2735', '409-4791', '380-5286', '394-8402',
'392-1616', '364-1969', '390-4152', '367-7039', '391-6607', '379-6652', '384-1833', '403-2455', '391-1348', '408-417
4', '366-4334', '406-5059', '373-6784', '408-3532', '350-8680', '398-9870', '343-3356', '415-4609', '404-5387', '41
5-8151', '416-2778', '393-3300', '391-7661', '339-4317', '418-6455', '378-3508', '390-9359', '364-2495', '364-7719',
'421-1189', '419-8987', '402-9980', '376-5908', '400-3150', '336-1749', '420-1259', '339-7541', '378-9029', '342-751
4', '422-4956', '389-8606', '406-7261', '417-7973', '390-2891', '385-7387', '362-2776', '329-1955', '344-3160', '40
6-2454', '335-3913', '355-7705', '410-7108', '419-1674', '351-7369', '349-9566', '333-3421', '393-8199', '388-4879',

```
'353-6007', '416-1557', '356-7217', '350-2012', '420-9838', '373-6379', '355-7293', '406-4588', '345-1524', '375-849
3', '361-2924', '359-6163', '411-8140', '381-9049', '344-4478', '360-2690', '410-7383', '356-1889', '341-2360', '37
0-3021', '336-4656', '386-2810', '350-1354', '346-5707', '405-8370', '373-2053', '369-5222', '347-7420', '392-6856',
'371-5556', '334-5337', '334-8817', '339-1405', '380-7742', '329-6191', '340-3075', '416-5849', '334-7443', '394-912
1', '383-1657', '347-4112', '362-8280', '402-9982', '392-8905', '392-5512', '351-6384', '348-8015', '374-6966', '32
8-2236', '372-6497', '417-8617', '361-9621', '421-2723', '327-9341', '383-5474', '328-8147', '373-5438', '333-9253',
'347-9421', '419-3167', '414-4162', '416-5341', '368-8600', '336-6085', '377-1479', '360-2107', '405-9384', '420-517
9', '331-3174', '411-5958', '333-8180', '357-2679', '396-2867', '341-9443', '341-4103', '416-8701', '397-6109', '39
2-5587', '392-9342', '368-2845', '405-4920', '348-7484', '338-5207', '418-7846', '358-8729', '349-1943', '368-8283',
'345-1419', '358-8025', '383-8695', '370-7565', '401-6162', '386-5303', '351-6552', '345-5338', '330-2849', '364-680
1', '375-3003', '383-8878', '384-2372', '377-7107', '361-1581', '417-7888', '383-8364', '396-2335', '408-4530', '40
8-6621', '393-7522', '338-7120', '357-4265', '398-8801', '346-2347', '343-2741', '420-8242', '402-7746', '332-1494',
'388-6223', '404-9539', '341-7332', '338-7886', '332-5596', '348-9945', '407-1896', '398-9408', '369-8005', '346-253
0', '400-5984', '351-1007', '345-5980', '368-8964', '358-1912', '379-3132', '340-9910', '396-2719', '369-6204', '42
0-9971', '410-3782', '404-4481', '383-9255', '418-9385', '360-9676', '327-3587', '385-4715', '414-2695', '331-5999',
'337-7739', '388-6658', '405-6943', '382-4084', '352-8249', '353-8363', '416-2825', '342-6696', '338-9210', '328-176
8', '406-5870', '398-3834', '330-7754', '414-9054', '350-2832', '414-9027', '337-1225', '394-6577', '359-6995', '37
7-7561', '380-6631', '390-8876', '413-2201', '374-2073', '417-1272', '358-1129', '394-1211', '327-1319', '399-4413',
'393-9985', '401-8377', '331-3202', '358-5953', '380-7624', '416-5261', '417-5067', '345-6515', '406-1349', '360-903
8', '348-3444', '370-2892', '383-4061', '391-7937', '389-4083', '410-9633', '418-9502', '339-6637', '356-3403', '37
1-9457', '391-8087', '392-6420', '399-4094', '378-4013', '386-6306', '359-3618', '340-8875', '330-2693', '403-7627',
'342-3678', '344-9943', '390-5686', '358-5826', '393-7826', '335-9786', '368-9860', '416-9522', '416-7307', '397-678
9', '335-9501', '388-1250', '386-1374', '346-8112', '364-9040', '366-3944', '331-9861', '330-2881', '402-9558', '34
1-3180', '371-8598', '398-8385', '333-4154', '330-3589', '417-1477', '327-5525', '363-8244', '419-9104', '363-1560',
'341-4075', '366-9074', '367-1424', '341-1191', '342-9480', '355-9360', '343-1538', '335-2331', '335-7257', '332-213
7', '352-2998', '346-6941', '400-2203', '421-2955', '331-6629', '343-6314', '414-6638', '350-5883', '409-4447', '37
6-4856', '335-1874', '397-6255', '381-5047', '403-6850', '375-3658', '341-2603', '342-5062', '354-1558', '351-9537',
'401-1252', '366-9538', '364-7622', '393-9918', '376-4484', '410-6791', '343-2392', '408-4323', '395-1718', '354-949
2', '367-8168', '340-3500', '369-4962', '334-8967', '402-2377', '366-3917', '333-3531', '333-8954', '374-9203', '33
4-3289', '353-7822', '350-1422', '385-8406', '380-7277', '352-1798', '385-7922', '353-7730', '337-7163', '348-5567',
'420-9575', '366-3358', '359-9972', '387-3332', '354-6960', '405-3335', '379-4257', '355-4992', '383-6373', '382-799
3', '422-5865', '410-9961', '343-9946', '357-7060', '355-9541', '378-4145', '386-2317', '335-8146', '377-2235', '38
6-9141', '416-5623', '327-3053', '395-6195', '397-8772', '346-7656', '343-2350', '372-4722', '399-8615', '379-8248',
'414-6219', '387-1343', '370-5527', '393-8736', '402-7626', '370-2688', '418-9036', '417-2035', '355-3602', '393-402
7', '418-5141', '406-1247', '402-3892', '332-2965', '377-1218', '355-2464', '404-4611', '373-2339', '410-3503', '41
0-4739', '365-3562', '387-7641', '385-9744', '398-5006', '408-3977', '334-2729', '334-7685', '350-9228', '407-5774',
'413-4039', '343-2077', '336-5661', '355-4143', '366-5918', '368-7555', '408-2119', '329-2789', '334-1508', '337-150
6', '396-8400', '349-2654', '417-2716', '402-1725', '403-3229', '353-6056', '399-9802', '366-7069', '332-5949', '39
3-6376', '354-7025', '351-6585', '330-5462', '407-2292', '340-3011', '345-9153', '379-5503', '389-6790', '408-3610',
'375-8238', '378-5633', '389-9120', '380-2758', '402-2728', '354-9062', '417-2054', '353-1941', '328-1522', '408-452
9', '417-5320', '370-9755', '372-4835', '334-6605', '399-5564', '392-2887', '328-2110', '383-5976', '332-6181', '33
0-5255', '413-5190', '394-7447', '353-7096', '395-6002', '372-9816', '400-7253', '344-7470', '378-8572', '345-9140',
```

```
'340-5460', '369-8024', '395-8595', '359-4587', '375-5439', '361-3779', '375-8934', '395-4757', '421-7205', '379-880
5', '348-2150', '417-9128', '351-4226', '330-6630', '387-9137', '372-3987', '408-5183', '412-9357', '402-3599', '37
9-5211', '405-9217', '340-9200', '339-9026', '343-4772', '345-2108', '401-4650', '400-3945', '338-3781', '342-6316',
'336-5920', '332-1060', '418-3426', '408-6326', '334-6142', '336-6128', '406-6708', '388-8670', '363-5853', '383-654
4', '378-2940', '338-7683', '329-2786', '369-9465', '337-3769', '400-6257', '411-6663', '384-3101', '339-5329', '38
8-9944', '403-1769', '390-1612', '421-7214', '338-6962', '333-9826', '411-8549', '381-9234', '387-9855', '371-6990',
'417-3046', '385-7082', '365-5886', '373-5196', '327-6194', '381-4565', '357-9832', '396-4845', '378-6772', '353-429
6', '362-8331', '362-4685', '383-1431', '332-2258', '375-8304', '340-5580', '362-1490', '336-4281', '361-1315', '34
2-5906', '405-7904', '349-4762', '385-3263', '405-9496', '396-6775', '393-6475', '379-7779', '408-8650', '400-3497',
'407-9244', '406-8809', '358-1778', '337-4339', '344-7197', '333-7631', '372-6623', '363-2602', '387-7757', '397-538
1', '406-4604', '376-9513', '360-1852', '421-7270', '371-9482', '337-4101', '420-2796', '366-4225', '398-4567', '38
8-4571', '360-8666', '333-3704', '383-2566', '406-5584', '344-4691', '347-9737', '333-7961', '364-2439', '411-8043',
'332-5084', '413-4831', '343-4806', '401-8735', '391-8626', '327-5817', '381-4712', '335-3320', '415-8780', '362-114
6', '352-7413', '387-6716', '352-1127', '368-1288', '403-5279', '397-9333', '411-7353', '383-2537', '330-4419', '39
0-7930', '362-5111', '358-6796', '409-7494', '400-1636', '389-2747', '415-2176', '377-8067', '362-7835', '361-5225',
'333-3447', '341-3044', '350-7306', '353-8849', '402-3476', '338-6018', '409-3520', '357-1085', '353-3285', '409-988
5', '388-7701', '385-8184', '345-2863', '353-6300', '389-5649', '378-8137', '340-4627', '352-6833', '420-2000', '36
8-5437', '418-8170', '403-9417', '330-6165', '412-4185', '409-4734', '348-9828', '418-8850', '330-8351', '347-7773',
'392-6841', '354-2189', '349-9060', '334-1311', '415-3120', '387-5891', '368-8026', '332-9446', '393-5284', '376-167
7', '392-2268', '396-4311', '363-4005', '344-9966', '337-7377', '373-7037', '356-7580', '390-3401', '350-9313', '42
0-9009', '415-2641', '392-4929', '346-5068', '389-2631', '368-3808', '406-8599', '386-7456', '357-4936', '397-7411',
'353-6218', '369-5942', '416-8543', '358-4576', '352-5118', '408-2621', '353-3994', '367-4277', '354-3237', '394-850
4', '370-4139', '382-6135', '359-5718', '385-3111', '353-4880', '343-7019', '419-6133', '350-7344', '397-6064', '36
3-6896', '416-9021', '408-3269', '408-9463', '340-7062', '417-4309', '421-2659', '383-2017', '411-6294', '332-9525',
'401-5012', '368-8835', '351-1382', '359-7694', '419-5505', '341-4570', '366-6991', '377-7399', '377-9092', '373-668
1', '417-7736', '393-2812', '398-3176', '334-8694', '369-5449', '380-5246', '390-3873', '354-4568', '339-6968', '37
9-5933', '365-5682', '382-8518', '356-8449', '333-3460', '375-8596', '384-5907', '373-2903', '361-7702', '388-5850',
'405-6298', '368-2074', '328-5050', '395-5783', '420-7301', '328-2478', '381-2460', '390-9811', '373-5670', '351-701
6', '394-9934', '422-8268', '373-7690', '366-9781', '404-5427', '389-9783', '351-7005', '348-2009', '340-4236', '34
8-1528', '365-5039', '411-1810', '364-7644', '335-9066', '362-7581', '346-1095', '357-9136', '390-7863', '344-2416',
'373-1448', '360-7076', '413-2241', '343-3961', '375-4107', '414-7410', '351-2535', '416-9615', '377-1293', '388-647
9', '390-2755', '340-5930', '401-3622', '382-1104', '355-9324', '393-4843', '401-4052', '385-1830', '348-7409', '36
1-4910', '415-6578', '395-5015', '369-6012', '394-4520', '380-5873', '372-5384', '419-1863', '352-5697', '373-4274',
'382-4024', '395-9215', '331-9149', '347-3958', '389-2540', '399-3083', '420-8308', '384-7724', '389-2114', '335-441
4', '370-5361', '374-5965', '420-6414', '392-2708', '352-7234', '337-9878', '350-7288', '415-8448', '392-6331', '39
2-3315', '382-5401', '389-7012', '411-4714', '343-3846', '370-4395', '422-4394', '405-1780', '393-2220', '355-8299',
'379-8681', '409-7034', '358-1922', '346-1629', '347-1870', '374-9576', '380-1096', '396-5790', '356-5244', '341-141
2', '387-7371', '392-2555', '403-9167', '338-6550', '357-5801', '403-1953', '357-6039', '388-9653', '359-2915', '38
1-4562', '406-2213', '330-6436', '332-4289', '386-3596', '337-3740', '414-1496', '349-7291', '385-1985', '329-7102',
'394-2553', '339-1330', '398-1959', '408-7015', '384-9254', '355-9475', '334-1337', '359-1441', '391-5442', '374-155
1', '399-6233', '337-4749', '403-5552', '405-3097', '364-9240', '404-9348', '336-1462', '364-8981', '412-7606', '38
0-6342', '418-3017', '367-3648', '341-5892', '334-4678', '366-6751', '397-8512', '367-9495', '379-2991', '356-4832',
```

```
'413-4040', '366-4444', '394-3806', '368-5647', '412-1076', '413-7655', '371-2316', '420-3346', '367-3971', '417-581
3', '421-8535', '375-1721', '331-8484', '366-5829', '367-7906', '412-2520', '386-9177', '420-6780', '401-1454', '37
9-2508', '353-3492', '406-4840', '391-7982', '379-9821', '398-7414', '338-8566', '397-3058', '389-8096', '393-6840',
'360-7404', '411-5740', '412-3726', '372-7326', '338-9873', '383-4322', '401-7654', '410-5455', '419-4310', '367-205
6', '363-6695', '374-6217', '337-9569', '350-9720', '380-4080', '333-7460', '378-3722', '353-9339', '386-6535', '40
3-5575', '331-5962', '390-9627', '406-4560', '359-6931', '331-7342', '367-2227', '335-8836', '398-6703', '370-8379',
'335-3880', '375-8761', '367-1398', '395-7857', '398-8745', '386-3717', '330-1175', '418-6752', '349-6464', '366-733
1', '361-8288', '377-6635', '408-1513', '370-7546', '389-4278', '379-3012', '355-3620', '413-7743', '372-2296', '33
3-9728', '415-6110', '340-9803', '400-7002', '395-7435', '336-7143', '352-2175', '346-6352', '405-7467', '379-8526',
'410-5713', '408-5916', '370-5626', '408-1331', '419-9688', '343-5219', '401-5586', '377-9178', '345-5639', '336-348
8', '414-6426', '335-5591', '421-9144', '422-7728', '344-3466', '398-7978', '346-8368', '392-2722', '393-3274', '33
9-4636', '349-7138', '363-3295', '407-9830', '333-8822', '419-6418', '351-8955', '338-1840', '336-6997', '408-6266',
'332-4291', '355-7895', '348-2916', '339-8132', '374-1684', '362-7604', '389-3206', '336-2829', '403-8916', '384-113
5', '390-2320', '398-8578', '393-9424', '417-6330', '340-6339', '380-6571', '368-6488', '363-2193', '328-1206', '38
5-3540', '337-7167', '372-8405', '377-1273', '380-7816', '402-6744', '400-2181', '366-1613', '347-8205', '328-2982',
'384-8723', '341-7686', '353-6038', '416-8827', '418-8450', '385-7861', '393-3507', '372-5262', '411-3095', '331-591
9', '402-1556', '349-7362', '339-2734', '330-4914', '371-2500', '335-3681', '405-1132', '399-9239', '350-7227', '38
4-6654', '376-4271', '391-8124', '393-2524', '384-4385', '377-8266', '345-1243', '394-8086', '348-9145', '376-5201',
'356-2093', '353-2080', '397-7500', '414-5786', '388-4282', '415-5132', '352-4541', '373-5928', '406-7737', '332-760
7', '359-7788', '384-1549', '352-8508', '404-1002', '414-2905', '380-9849', '387-6498', '360-6024', '352-5815', '36
6-2273', '414-9119', '409-8796', '337-2442', '404-1931', '367-9765', '378-7299', '410-5192', '405-1108', '392-1734',
'395-6030', '330-5168', '334-3142', '362-9983', '414-2606', '402-4501', '387-2604', '400-3343', '353-2450', '406-203
2', '409-4462', '392-5941', '334-9182', '346-3445', '368-9507', '382-3966', '334-5844', '362-9411', '390-3565', '41
7-4810', '384-3389', '414-9717', '357-1700', '376-7207', '368-7706', '346-4216', '370-9533', '372-1493', '387-6031',
'366-6248', '369-3756', '363-1719', '402-6666', '408-9779', '407-2441', '384-5027', '380-3161', '360-8135', '399-542
6', '385-2564', '337-8618', '354-8491', '394-6278', '405-2276', '376-1000', '397-1659', '379-3953', '418-6512', '39
2-5296', '355-3814', '375-2098', '372-7990', '356-4558', '398-5788', '390-4003', '332-8103', '406-9926', '418-2402',
'384-3299', '378-9090', '350-6473', '379-4583', '411-5078', '347-4982', '341-9274', '353-7461', '371-7366', '395-792
3', '351-8398', '329-2204', '407-7507', '405-8075', '390-9698', '403-4917', '391-6709', '389-5988', '372-1534', '39
5-6369', '400-3197', '377-4169', '384-5343', '338-4472', '332-2126', '349-2157', '393-4823', '385-2683', '345-8350',
'334-4506', '332-3544', '380-5102', '395-6149', '398-8122', '334-4438', '384-7459', '368-3931', '353-1352', '348-572
5', '365-2008', '393-3635', '380-8727', '381-2376', '365-8114', '415-5008', '392-8318', '401-4007', '338-7709', '37
4-1981', '333-5101', '345-3734', '384-5004', '341-9396', '408-6302', '348-7193', '417-4063', '375-6911', '358-3604',
'339-7485', '368-3078', '418-7055', '386-9981', '366-2541', '335-3110', '400-7809', '404-3106', '333-2337', '353-648
2', '397-8162', '380-6722', '329-2918', '348-8022', '388-4459', '358-3114', '343-9654', '401-9909', '404-9978', '39
7-8011', '341-8719', '408-1242', '406-7726', '351-2773', '368-6174', '334-5029', '413-1789', '414-1246', '330-4978',
'386-1631', '363-1208', '334-5263', '361-4137', '374-8187', '370-1525', '355-3801', '392-5605', '363-1366', '358-527
4', '376-9607', '374-1213', '421-8537', '351-5576', '407-7258', '405-4420', '340-2855', '342-8002', '355-6826', '40
2-3886', '336-5900', '339-7684', '390-2433', '360-7246', '335-6508', '348-6720', '406-6400', '390-7370', '390-5055',
'405-7542', '364-4927', '329-3458', '331-3842', '343-4147', '335-2274', '343-3227', '336-6907', '331-1391', '360-164
3', '410-2518', '344-4970', '408-1486', '396-1648', '391-2022', '420-6465', '398-2628', '409-5519', '391-8554', '39
5-1693', '393-3194', '328-3402', '411-4781', '401-2581', '385-1214', '348-6853', '341-8412', '330-8142', '361-1404',
```

```
'375-9671', '372-1824', '408-3606', '333-3595', '379-7009', '411-4940', '409-7523', '408-6725', '350-2384', '348-170
6', '415-6145', '373-3731', '341-3349', '399-8859', '377-4518', '341-1594', '418-8770', '332-9118', '386-1418', '39
3-3535', '328-9006', '402-2482', '408-4865', '396-6247', '396-9462', '396-9279', '363-8715', '356-1358', '360-7839',
'364-8774', '348-5038', '365-4728', '351-9037', '397-9184', '398-4538', '382-6827', '408-1340', '333-9511', '358-737
9', '397-1766', '331-2144', '345-7014', '395-1898', '373-8920', '373-8908', '415-1203', '369-7017', '420-8435', '39
5-2579', '405-7850', '394-7710', '342-4122', '340-1876', '383-6095', '413-1061', '343-5347', '376-4861', '417-2265',
'419-7415', '407-2259', '333-2906', '360-7477', '342-5243', '417-3999', '379-1720', '368-3117', '352-5000', '405-767
6', '361-2349', '383-2901', '369-7049', '387-5533', '362-3660', '357-3577', '394-3312', '395-8330', '373-8895', '38
6-4581', '354-8191', '359-7562', '359-4336', '336-9901', '406-3069', '334-6519', '361-8113', '347-9769', '352-9130',
'378-4557', '360-8919', '405-4109', '381-2498', '357-5696', '412-2947', '363-3571', '405-5403', '330-9354', '396-709
1', '398-3004', '400-4020', '356-3448', '335-2019', '332-6633', '359-7648', '412-9190', '368-9007', '384-5632', '35
2-6068', '343-9645', '384-7873', '396-2187', '383-5109', '377-7843', '382-7999', '328-1222', '371-1727', '369-8871',
'335-9726', '357-3709', '422-9964', '366-9211', '384-9033', '382-4932', '404-7518', '353-1954', '391-7166', '370-900
0', '332-3642', '412-3898', '366-5640', '356-2302', '345-9018', '365-6205', '337-1151', '374-4664', '396-9656', '37
7-5043', '401-7359', '375-2184', '367-6005', '364-2166', '414-4741', '403-9719', '371-8452', '392-6239', '410-5250',
'336-1574', '406-8324', '411-7110', '341-9907', '400-8952', '333-9266', '419-4894', '364-9904', '394-3048', '352-626
5', '357-3187', '373-8483', '375-9930', '352-6282', '396-2945', '412-3527', '328-4231', '413-9055', '363-8755', '38
8-8891', '360-1776', '411-3578', '399-7268', '350-1532', '359-2197', '407-9290', '358-6672', '393-4621', '336-7357',
'351-1466', '394-6668', '403-2673', '355-1735', '416-7679', '340-4972', '417-4826', '408-6676', '417-6683', '331-627
0', '404-9754', '364-9425', '339-6477', '362-2787', '405-9233', '416-1845', '385-9657', '420-5652', '415-1141', '33
4-5634', '403-4200', '357-7893', '369-2899', '381-1026', '388-8722', '418-3135', '380-3974', '338-7232', '334-5223',
'340-8323', '337-6851', '344-5973', '335-2261', '343-1458', '415-4875', '381-2726', '395-3852', '358-7914', '332-695
8', '355-1019', '382-9447', '386-8536', '363-3818', '360-6416', '332-8764', '398-4814', '410-5963', '399-6642', '39
0-9986', '391-1793', '352-5542', '386-8118', '394-9825', '382-4952', '387-2698', '417-1360', '408-4836', '374-8329',
'363-8424', '408-8910', '399-3840', '367-8692', '387-4504', '328-2647', '369-7903', '399-6852', '335-4888', '344-226
0', '349-4070', '394-6505', '419-3612', '356-1952', '416-7866', '398-1759', '338-9950', '412-7278', '347-1263', '38
6-5684', '334-4354', '398-5970', '330-3429', '418-4637', '393-7322', '353-5557', '411-5334', '398-8588', '374-7285',
'379-7215', '357-7875', '393-9677', '345-9598', '353-3203', '330-7486', '397-6425', '338-1815', '406-5023', '368-245
8', '400-8375', '387-8201', '346-4360', '412-8811', '413-3990', '345-2448', '394-4512', '400-8538', '412-8769', '39
0-1552', '389-2477', '389-4695', '406-8037', '382-9138', '414-7942', '348-7071', '404-2942', '348-3581', '327-6764',
'405-2831', '416-4351', '419-3196', '411-6211', '391-8369', '416-4464', '347-1814', '386-7337', '375-8505', '407-505
6', '367-8924', '419-5171', '396-7687', '394-4548', '382-6438', '413-2194', '366-2622', '416-7591', '355-2634', '42
2-5350', '329-2388', '381-5273', '421-6694', '342-1702', '381-4029', '335-2967', '416-6594', '388-6026', '367-1024',
'386-7118', '346-2020', '329-9067', '329-6144', '332-1502', '342-8320', '411-5748', '381-9367', '400-1280', '360-579
4', '373-3538', '394-9942', '380-3329', '334-7618', '327-9289', '351-2589', '368-6892', '337-9303', '377-5258', '34
8-5767', '373-3549', '422-8344', '411-2958', '384-2908', '347-6393', '385-7148', '419-2767', '375-1746', '362-7870',
'410-3725', '387-1535', '329-2045', '341-6743', '336-8343', '368-5758', '346-8362', '345-9690', '339-9798', '359-573
1', '373-2091', '367-3439', '367-1681', '420-9973', '351-4025', '393-5897', '384-7216', '384-4595', '329-9667', '34
7-5063', '345-8433', '339-7602', '332-1109', '343-3296', '366-2536', '355-2293', '350-9318', '418-5300', '395-2626',
'402-7372', '337-9710', '363-4967', '400-5389', '416-9162', '414-6541', '392-6647', '343-2465', '338-9171', '405-460
6', '386-9711', '327-8495', '416-5660', '370-3032', '331-8462', '414-4037', '415-2865', '362-2353', '329-5114', '35
1-1389', '375-3668', '375-5414', '360-7079', '344-9302', '418-1775', '401-2468', '346-4984', '351-2928', '365-7774',
```

```
'358-3691', '364-9059', '356-7208', '333-5551', '362-6528', '394-2560', '367-3220', '418-5708', '421-2245', '406-224
2', '347-6994', '413-7468', '389-6082', '415-3689', '379-2503', '396-1106', '379-4372', '336-3738', '380-2600', '34
5-4473', '380-9990', '411-1045', '413-5306', '417-6906', '331-4807', '376-5375', '361-9839', '348-8679', '403-6565',
'346-5287', '413-6769', '370-5042', '397-9486', '364-3286', '420-8897', '378-9506', '399-6259', '335-5806', '401-639
2', '379-9859', '415-4051', '368-5612', '374-5301', '406-5710', '354-7077', '343-3340', '377-8267', '382-2453', '33
3-7449', '366-4287', '415-2285', '381-1328', '344-4022', '415-6601', '351-7309', '363-7802', '408-4870', '378-9478',
'401-4778', '370-9563', '394-6382', '333-5295', '370-2451', '401-6982', '329-8115', '340-3409', '397-5911', '415-612
7', '392-6073', '419-6564', '340-8245', '376-4540', '361-5936', '421-9846', '356-1582', '375-4900', '420-8953', '37
6-4035', '344-5206', '328-7833', '417-4266', '351-6574', '372-8925', '340-5678', '361-6814', '336-7155', '342-8167',
'375-9180', '357-7064', '347-5354', '362-9391', '386-8984', '384-6372', '358-1329', '400-7987', '327-8732', '389-695
5', '396-1800', '349-4979', '361-5864', '418-4658', '330-6208', '416-6628', '349-5617', '397-8051', '413-6346', '39
5-9270', '401-7575', '332-5964', '348-3338', '387-5411', '378-7872', '389-6037', '349-3732', '347-9738', '380-6074',
'338-4307', '339-3636', '328-9315', '402-3634', '348-4316', '375-3826', '360-1406', '356-5475', '363-9969', '350-436
7', '348-1592', '368-9751', '380-6413', '367-9259', '404-8765', '371-6284', '403-9468', '335-3133', '366-4426', '35
4-4752', '406-4768', '367-9257', '342-8348', '410-7611', '341-3270', '416-7452', '356-8982', '340-6908', '348-6659',
'345-2401', '422-5264', '422-1799', '404-2877', '417-7913', '399-2457', '419-3427', '358-2490', '349-3112', '414-542
2', '386-3766', '386-9724', '416-7393', '395-1380', '408-4911', '387-4064', '380-5667', '402-8930', '336-6533', '35
9-9992', '391-1737', '404-2871', '420-6121', '369-4012', '357-2294', '348-9938', '394-3023', '352-5466', '364-5510',
'396-6462', '384-5335', '416-6886', '357-2748', '386-7976', '403-9199', '361-1900', '405-3848', '344-1136', '378-627
6', '343-2592', '396-4410', '397-3943', '347-3821', '400-8069', '346-5349', '345-5089', '410-4613', '356-4706', '34
7-3406', '333-9133', '392-2459', '401-3685', '352-7752', '388-9285', '332-5582', '376-2550', '333-4594', '375-2522',
'388-2240', '420-1782', '384-8890', '371-4788', '360-5636', '373-4264', '352-9836', '342-2013', '354-5689', '335-842
7', '409-6753', '349-1756', '328-8980', '399-2151', '379-9524', '352-9947', '336-1043', '416-7013', '345-4551', '40
5-9864', '350-4297', '350-7114', '400-4244', '417-2608', '372-2990', '353-9998', '330-3008', '384-8629', '404-9504',
'405-8753', '409-9911', '394-4260', '380-9063', '395-4509', '401-6671', '405-7204', '329-5377', '408-9572', '380-987
9', '384-9243', '404-5597', '359-7521', '327-4795', '338-7955', '379-6970', '351-7807', '342-9394', '384-6264', '35
2-4534', '378-4617', '364-9567', '371-5875', '383-6489', '345-7117', '384-3902', '386-2759', '356-1270', '379-1336',
'354-7201', '404-5057', '407-8012', '332-6139', '328-1373', '411-6501', '329-8056', '415-4564', '329-6192', '384-390
4', '373-1028', '369-1220', '359-9369', '415-3016', '414-7090', '350-2250', '383-9355', '417-3257', '336-8010', '35
4-7718', '358-4412', '368-8972', '407-9841', '393-5208', '332-2889', '374-5530', '332-3381', '344-9347', '412-1991',
'393-4528', '347-2378', '385-2699', '383-4319', '352-7915', '375-5547', '337-2348', '342-8702', '393-5802', '384-221
9', '347-6164', '376-9940', '354-4352', '331-8713', '341-3663', '376-4665', '421-9034', '401-5169', '370-8262', '38
7-2041', '356-4146', '372-8883', '336-1880', '347-5843', '370-8023', '417-9814', '387-3422', '365-1664', '367-2436',
'344-6258', '353-8928', '365-7784', '330-2635', '344-3131', '378-4294', '343-9365', '362-5579', '366-7616', '397-287
0', '408-3262', '372-9091', '410-3159', '344-5181', '396-8662', '339-6446', '384-7236', '353-5257', '369-7295', '40
8-5322', '344-9620', '329-8436', '414-6739', '406-1730', '336-9327', '378-7418', '412-6019', '390-4789', '386-9774',
'353-8970', '410-5370', '404-4421', '409-3353', '422-2571', '412-3404', '333-2964', '406-6669', '409-8802', '354-618
3', '354-2434', '389-7620', '338-1724', '399-1750', '354-8914', '409-2983', '329-9689', '337-8950', '374-1836', '35
9-9454', '378-9542', '344-1970', '417-2774', '333-9002', '369-8576', '372-6920', '333-6575', '410-1190', '376-1641',
'329-6731', '393-3976', '388-7355', '412-7791', '368-6111', '401-9420', '352-5750', '417-3702', '353-5714', '409-949
4', '395-1901', '378-8342', '417-6044', '348-1163', '337-4600', '355-5922', '369-5810', '340-8291', '354-7397', '40
7-7464', '386-6411', '397-3746', '410-5236', '409-2412', '400-7280', '332-5820', '373-4483', '347-6717', '380-2929',
```

```
'420-7692', '380-6437', '377-8309', '407-2718', '357-1938', '381-3735', '409-8453', '395-6758', '399-5424', '409-467
1', '374-6525', '406-8665', '342-7716', '417-2221', '376-5213', '348-7448', '328-8179', '389-4602', '413-2238', '40
2-3370', '348-6008', '371-5655', '374-5224', '371-1187', '337-1100', '421-8141', '406-2678', '415-9649', '364-8128',
'356-7817', '404-6357', '398-2138', '378-8029', '386-4215', '367-8156', '382-8079', '354-2985', '373-6922', '397-712
5', '333-6296', '365-6022', '365-1688', '382-4872', '367-6136', '404-3592', '415-2949', '375-8880', '335-6832', '36
1-8367', '408-2002', '347-8659', '376-2922', '382-2182', '408-2089', '369-6890', '347-2951', '420-6324', '402-7650',
'391-2702', '383-3375', '392-2733', '397-9933', '383-9306', '369-1929', '369-4377', '366-9430', '353-7407', '359-742
6', '332-7391', '405-6559', '338-8784', '415-6347', '354-5058', '342-5701', '378-4179', '407-6391', '404-3105', '39
0-9735', '350-4820', '383-8807', '366-8382', '402-9704', '405-2209', '397-3939', '343-2689', '383-9448', '359-6232',
'369-9772', '381-7003', '352-6732', '388-7540', '356-3333', '333-9664', '363-3763', '345-7900', '400-5511', '381-759
7', '404-9775', '389-4608', '403-1742', '328-9797', '359-9223', '336-7696', '369-2214', '411-1325', '410-7553', '37
6-4284', '334-2800', '369-1904', '359-3833', '348-5569', '342-1960', '352-9050', '390-5316', '418-8568', '401-4844',
'376-5471', '409-2917', '369-6308', '357-7385', '405-7119', '405-3309', '384-4938', '377-2725', '405-6398', '355-936
6', '403-1128', '384-9682', '352-5393', '395-1229', '361-9195', '351-6366', '346-4919', '354-9068', '369-2743', '34
3-1347', '336-5495', '376-4292', '391-8677', '350-7273', '400-6454', '422-3052', '365-6756', '406-4158', '383-4641',
'368-5165', '378-2432', '362-4159', '363-7979', '334-9818', '352-5787', '332-3617', '327-9957', '338-7527', '348-871
1', '421-3226', '391-4358', '379-2523', '419-2369', '382-1227', '409-5749', '362-7951', '415-3537', '373-3959', '35
8-1346', '381-8422', '360-9005', '344-5967', '396-6390', '346-5036', '328-7252', '360-1745', '358-2046', '344-6935',
'401-9665', '399-5291', '409-6588', '358-5721', '414-7446', '329-9517', '415-9553', '413-3177', '347-5113', '330-266
2', '330-5824', '411-1261', '329-8788', '333-7869', '399-4800', '402-2072', '403-6187', '355-2872', '386-2970', '38
9-6081', '348-7556', '334-9163', '411-4293', '375-5562', '386-3823', '364-6445', '383-2251', '351-3169', '413-6380',
'380-9674', '345-2319', '377-5441', '358-3692', '400-5831', '357-5995', '391-2159', '398-5954', '385-6175', '334-296
1', '405-4303', '406-4100', '352-4401', '347-1473', '347-2016', '388-8948', '402-5509', '367-2598', '370-5001', '33
2-3693', '403-9766', '363-2407', '395-9214', '351-8894', '406-5003', '398-1332', '363-8033', '333-1012', '391-6260',
'336-1353', '365-5629', '349-4397', '380-3910', '354-7820', '338-9952', '405-1821', '329-8669', '328-8808', '409-301
8', '421-5994', '354-4448', '352-5081', '401-7803', '420-6052', '352-6084', '388-8583', '415-3158', '402-9304', '34
1-1916', '381-2745', '402-5014', '399-8846', '328-9267', '348-7224', '336-2190', '376-4705', '381-4076', '348-8464',
'412-7020', '386-8432', '337-1802', '366-1084', '352-4182', '368-5628', '333-8996', '353-2557', '356-8621', '354-694
2', '377-9829', '348-4660', '410-5199', '397-6542', '333-4492', '405-9573', '359-7255', '419-5501', '404-4809', '34
4-6334', '400-1899', '346-5053', '398-2148', '347-7675', '411-8956', '390-3761', '377-3876', '345-2476', '337-7879',
'361-7283', '372-4868', '346-8863', '390-5267', '392-1547', '340-8177', '383-4802', '378-8567', '406-7844', '402-917
3', '352-3440', '363-1413', '394-8861', '358-4036', '392-4680', '354-2762', '371-5811', '387-2014', '411-6598', '35
5-9356', '406-4720', '356-7239', '328-8747', '388-9464', '406-2866', '333-5729', '391-1499', '386-8690', '391-2231',
'332-2275', '340-4028', '363-3486', '418-3181', '351-3316', '369-3626', '353-2763', '358-7165', '353-3223', '338-904
4', '341-7296', '398-4431', '408-5601', '328-5188', '329-4474', '357-4573', '341-7112', '400-3147', '378-1936', '34
7-1640', '374-9531', '380-4374', '380-9409', '387-1116', '400-7509', '403-6225', '382-8274', '354-5764', '387-6912',
'384-3413', '367-3950', '396-4254', '333-3010', '393-1891', '336-9053', '353-3372', '386-8943', '376-9716', '370-867
6', '360-2329', '360-1320', '329-8638', '385-1118', '408-8269', '391-2334', '373-8900', '382-3512', '420-4089', '40
6-8465', '386-6114', '413-9328', '335-7144', '414-5177', '350-5993', '370-1465', '385-2370', '358-9146', '357-8515',
'406-8995', '344-3145', '341-9890', '365-4387', '375-3341', '418-3096', '378-3879', '344-1362', '419-3937', '348-496
1', '329-1410', '332-9896', '407-8575', '387-2799', '373-9108', '345-3947', '356-7511', '343-4516', '408-6305', '33
8-7305', '401-3077', '401-6977', '385-1464', '417-5034', '420-7066', '394-8256', '362-5044', '350-2075', '343-5372',
```

```
'377-9520', '391-6773', '403-4442', '379-5885', '399-1021', '342-4004', '382-7659', '342-1004', '398-5851', '396-486
9', '422-8333', '367-9127', '420-3028', '357-6348', '386-1131', '349-8391', '421-1484', '414-2663', '327-6989', '40
5-5513', '345-9168', '417-5146', '339-2792', '345-8397', '344-6404', '417-9455', '343-1009', '365-3493', '376-7043',
'348-5728', '357-5784', '417-9844', '333-7225', '382-4943', '345-4589', '404-6337', '412-1470', '394-9220', '364-536
2', '372-9852', '394-9984', '402-1668', '339-5659', '341-7279', '371-3236', '343-5679', '347-4626', '344-8498', '34
9-3005', '371-3498', '367-4853', '422-3454', '403-8915', '371-2418', '411-2977', '389-8163', '417-4456', '351-1894',
'386-6408', '370-9592', '397-9251', '395-6913', '332-3804', '421-1326', '415-8200', '371-9414', '347-3895', '342-585
4', '379-7192', '394-5753', '390-6932', '394-3171', '394-5202', '348-3777', '407-3949', '363-4779', '340-2239', '35
9-3423', '382-9297', '330-9294', '362-8763', '403-4816', '371-2155', '334-1339', '341-7412', '375-4770', '406-7643',
'415-8164', '354-3545', '377-3139', '418-7478', '385-6952', '381-8593', '365-9371', '401-7335', '364-5126', '385-715
7', '385-4766', '390-1760', '365-8831', '353-4002', '367-5923', '393-9548', '362-2356', '365-2341', '388-8797', '40
0-4713', '420-3042', '396-4171', '389-8417', '339-4068', '341-4873', '336-2322', '402-1607', '379-3037', '382-1399',
'394-5489', '387-6065', '327-6087', '341-8667', '338-9612', '364-1134', '413-4811', '354-4333', '382-2026', '368-328
7', '367-8298', '391-1783', '393-8762', '385-1423', '406-7670', '339-5423', '366-8939', '353-2391', '372-4203', '38
5-5688', '397-7453', '366-9015', '356-1654', '337-3932', '350-1126', '416-3649', '349-1726', '405-1589', '366-7560',
'333-9643', '355-6422', '329-5400', '383-6356', '377-7276', '337-1586', '336-9273', '415-5476', '332-2650', '418-825
7', '407-3121', '381-2413', '378-1144', '359-5091', '378-6986', '386-6580', '419-9713', '382-6153', '332-1690', '34
8-9383', '420-3857', '405-2653', '417-9278', '352-5663', '370-8786', '415-6333', '391-6558', '396-4234', '345-6961',
'346-5992', '402-3908', '350-2340', '410-2015', '380-3311', '399-7029', '337-3868', '354-8088', '416-9723', '337-440
3', '416-1536', '386-3796', '340-4989', '340-6221', '363-3469', '345-3787', '362-3107', '345-1994', '377-5417', '36
9-8574', '344-6847', '391-7528', '393-6053', '392-6286', '365-9079', '399-3089', '365-2192', '394-3051', '357-2429',
'421-6268', '401-5915', '348-6057', '349-3843', '396-5561', '370-9622', '371-9602', '351-2815', '369-8703', '355-284
0', '372-1115', '337-2986', '404-3238', '397-4968', '327-1058', '419-9509', '349-7282', '382-5743', '358-2694', '37
8-1884', '330-1627', '392-5716', '384-6132', '359-2740', '338-6714', '347-9968', '343-3399', '334-6129', '377-4975',
'405-3533', '337-9326', '338-6556', '354-3040', '396-1278', '354-6810', '403-6237', '411-6823', '338-1400', '412-624
5', '377-3417', '343-2597', '388-8282', '416-8394', '343-6643', '330-4364', '414-1537', '408-1913', '406-5532', '41
7-7722', '367-5226', '344-5766', '405-1370', '368-9073', '373-7974', '371-4633', '336-4960', '405-5083', '392-1105',
'378-2397', '331-4184', '376-2408', '345-3614', '370-9296', '402-5076', '401-7334', '409-3428', '362-2067', '352-227
0', '404-5840', '360-3126', '364-8731', '388-4331', '335-7324', '362-8886', '410-4882', '371-1139', '391-5516', '38
0-3186', '347-9995', '340-9013', '362-8378', '418-8969', '417-1488', '358-9898', '373-7308', '330-7137', '406-8445',
'404-5283', '398-3632', '399-5763', '340-9449', '363-1123', '361-2170', '406-6304', '392-5090', '373-7713', '392-137
6', '390-6388', '379-7290', '397-9928', '378-6924', '411-5677', '400-2738', '409-1856', '362-5899', '377-1164', '36
8-8555', '347-6812', '348-3830', '414-4276', '370-3271', '328-8230', '364-6381', '400-4344']

 Unique values for international plan
 N-unique values for international plan is 2
['no', 'yes']

 Unique values for voice mail plan
 N-unique values for voice mail plan is 2
['yes', 'no']
```

```
 Unique values for number vmail messages
 N-unique values for number vmail messages is 46
[25, 26, 0, 24, 37, 27, 33, 39, 30, 41, 28, 34, 46, 29, 35, 21, 32, 42, 36, 22, 23, 43, 31, 38, 40, 48, 18, 17, 45, 1
6, 20, 14, 19, 51, 15, 11, 12, 47, 8, 44, 49, 4, 10, 13, 50, 9]

 Unique values for total day minutes
 N-unique values for total day minutes is 1667
[265.1, 161.6, 243.4, 299.4, 166.7, 223.4, 218.2, 157.0, 184.5, 258.6, 129.1, 187.7, 128.8, 156.6, 120.7, 332.9, 196.
4, 190.7, 189.7, 224.4, 155.1, 62.4, 183.0, 110.4, 81.1, 124.3, 213.0, 134.3, 190.0, 119.3, 84.8, 226.1, 212.0, 249.6
, 176.8, 220.0, 146.3, 130.8, 203.9, 140.4, 126.3, 173.1, 124.8, 85.8, 154.0, 120.9, 211.3, 187.0, 159.1, 133.2, 191.
9, 220.6, 186.1, 160.2, 151.0, 175.5, 126.9, 198.4, 148.8, 229.3, 192.1, 268.6, 193.7, 180.7, 131.2, 148.1, 251.5, 12
5.2, 211.6, 178.9, 241.8, 224.9, 248.6, 203.4, 235.8, 157.1, 300.3, 61.6, 214.1, 170.2, 201.1, 215.4, 165.6, 249.5, 2
10.6, 179.3, 157.9, 214.3, 154.1, 237.9, 143.9, 252.9, 179.1, 278.4, 160.1, 198.2, 212.1, 251.8, 161.2, 178.3, 151.7,
135.0, 170.5, 238.1, 281.4, 117.9, 148.6, 229.8, 165.0, 185.0, 161.0, 126.7, 58.9, 196.8, 162.6, 282.5, 113.7, 239.8,
210.2, 213.8, 170.9, 154.2, 201.4, 70.7, 187.5, 91.7, 214.2, 145.5, 166.3, 231.0, 200.3, 197.0, 129.9, 175.8, 203.1,
183.2, 205.0, 148.5, 192.6, 246.5, 167.1, 231.9, 146.7, 271.5, 181.5, 257.7, 193.8, 102.8, 187.9, 226.0, 260.4, 178.7
, 337.4, 157.6, 183.6, 142.1, 136.3, 217.1, 98.9, 206.3, 243.1, 189.8, 202.0, 170.1, 230.9, 237.1, 182.1, 116.8, 219.
2, 252.6, 147.1, 202.1, 173.5, 232.1, 197.1, 58.2, 115.6, 259.9, 158.7, 271.6, 160.6, 232.4, 133.8, 176.9, 209.9, 137
.5, 289.5, 198.1, 149.7, 326.5, 292.9, 83.0, 145.7, 182.3, 218.0, 140.6, 152.7, 106.7, 243.8, 194.4, 213.9, 217.2, 24
1.1, 203.5, 155.2, 167.6, 226.7, 151.4, 180.0, 250.2, 223.0, 166.0, 136.1, 149.3, 65.4, 213.4, 206.9, 186.2, 280.2, 1
96.6, 312.0, 199.0, 168.8, 134.4, 202.6, 74.5, 83.6, 192.2, 220.2, 135.1, 253.4, 225.0, 198.5, 110.3, 60.0, 214.8, 18
1.8, 157.4, 207.9, 207.0, 119.0, 143.7, 165.9, 138.6, 84.7, 62.6, 164.9, 134.5, 143.3, 168.3, 262.4, 206.2, 225.8, 13
8.3, 94.4, 160.0, 206.6, 134.7, 214.4, 192.8, 151.1, 221.4, 218.9, 192.7, 204.4, 172.3, 211.7, 221.6, 197.9, 147.5, 2
06.4, 205.9, 207.6, 303.9, 230.6, 99.5, 177.1, 172.7, 204.2, 85.7, 215.5, 171.7, 266.6, 170.4, 158.0, 92.0, 234.0, 27
2.1, 296.4, 227.2, 248.7, 236.3, 205.6, 94.1, 60.4, 121.0, 117.8, 223.5, 176.3, 138.7, 86.3, 58.8, 68.7, 239.2, 198.3
, 205.2, 272.6, 128.3, 169.6, 201.3, 214.7, 169.2, 194.1, 233.8, 225.1, 183.9, 221.8, 64.6, 154.6, 260.2, 155.9, 107.
0, 182.5, 220.1, 152.2, 236.2, 166.1, 244.6, 134.2, 150.1, 257.1, 124.4, 141.7, 230.0, 162.3, 350.8, 193.3, 78.2, 83.
4, 195.6, 201.8, 164.8, 179.2, 214.0, 205.7, 165.5, 221.0, 242.1, 151.6, 176.2, 196.0, 159.5, 230.2, 210.5, 102.0, 12
6.0, 168.4, 105.6, 206.5, 229.6, 278.3, 234.4, 167.3, 221.1, 145.8, 222.8, 183.4, 264.3, 146.0, 127.3, 178.8, 97.2, 2
59.8, 256.5, 169.5, 239.7, 171.5, 239.9, 142.3, 184.1, 203.8, 248.8, 192.9, 122.4, 104.9, 173.2, 119.4, 250.3, 155.0,
288.7, 240.4, 190.3, 278.0, 153.5, 273.4, 155.3, 133.1, 246.8, 165.4, 59.5, 286.7, 117.3, 127.9, 225.5, 149.0, 198.9,
256.4, 264.8, 98.2, 159.8, 190.6, 184.0, 261.8, 147.9, 106.4, 133.7, 193.5, 178.2, 226.2, 70.9, 240.3, 75.0, 69.1, 96
.6, 214.6, 258.1, 149.8, 190.4, 181.4, 155.7, 149.9, 222.3, 149.4, 242.9, 150.4, 208.9, 130.7, 119.6, 273.6, 156.1, 1
77.5, 175.2, 114.3, 251.4, 216.9, 159.3, 143.1, 186.6, 170.8, 124.0, 172.8, 217.4, 265.9, 93.6, 168.2, 202.9, 261.4,
73.3, 253.7, 45.0, 231.3, 47.4, 227.4, 40.9, 68.5, 163.5, 163.0, 213.7, 310.4, 48.4, 171.2, 166.5, 216.6, 107.8, 141.
3, 237.5, 234.5, 103.1, 129.5, 279.8, 136.8, 100.1, 224.5, 288.1, 148.7, 194.6, 194.5, 174.1, 131.8, 146.8, 200.7, 14
5.6, 229.4, 211.0, 121.5, 216.0, 293.0, 74.3, 62.3, 228.6, 228.1, 309.9, 201.9, 183.8, 186.7, 209.4, 223.2, 164.2, 15
0.5, 234.2, 55.3, 89.7, 80.2, 125.7, 207.2, 157.5, 160.4, 159.0, 102.6, 159.7, 202.8, 57.5, 169.9, 335.5, 139.5, 187.
8, 146.2, 231.8, 156.4, 220.7, 172.0, 128.2, 130.2, 195.4, 293.3, 191.3, 209.6, 215.7, 161.4, 144.2, 256.2, 112.7, 29
9.5, 194.8, 100.8, 82.5, 146.4, 177.9, 150.7, 180.1, 265.3, 128.6, 161.5, 165.3, 195.0, 205.5, 235.6, 192.0, 261.7, 2
35.5, 263.8, 175.6, 242.5, 138.1, 264.7, 282.3, 211.2, 205.3, 252.0, 231.2, 200.1, 266.7, 118.1, 175.3, 125.1, 241.9,
241.2, 222.4, 189.5, 123.1, 256.7, 30.9, 187.4, 315.6, 277.5, 147.2, 185.8, 155.4, 97.6, 206.0, 216.8, 103.3, 139.4,
```

```
191.2, 221.7, 62.9, 215.6, 94.7, 203.2, 195.3, 114.4, 175.9, 249.9, 210.7, 87.2, 137.4, 224.8, 261.2, 196.5, 271.2, 3
00.4, 57.1, 162.1, 145.0, 34.0, 193.4, 191.7, 161.3, 150.6, 184.6, 121.1, 109.6, 167.5, 115.8, 276.6, 179.4, 187.3, 2
01.2, 189.6, 186.8, 187.6, 244.9, 187.1, 170.7, 161.1, 169.4, 254.4, 127.7, 219.1, 273.5, 161.9, 241.7, 62.8, 281.1,
228.2, 209.8, 265.6, 214.9, 110.5, 137.8, 112.8, 180.4, 153.7, 261.3, 246.2, 191.0, 208.3, 253.0, 202.3, 174.4, 127.1
, 143.5, 186.9, 194.0, 234.8, 123.7, 173.9, 130.9, 314.6, 227.9, 95.5, 185.3, 105.8, 178.0, 172.1, 169.3, 119.1, 194.
2, 198.8, 167.7, 202.2, 322.5, 216.2, 76.4, 72.7, 210.4, 127.2, 219.5, 99.3, 224.7, 176.6, 283.9, 180.6, 125.9, 237.6
, 274.3, 199.6, 217.7, 212.7, 256.3, 267.9, 163.6, 180.9, 105.0, 271.4, 206.7, 166.8, 204.9, 127.0, 267.4, 281.0, 270
.8, 124.1, 162.8, 254.8, 254.9, 107.7, 158.8, 182.9, 178.4, 110.9, 166.9, 244.8, 120.8, 215.9, 140.1, 139.8, 321.6, 1
66.6, 260.0, 190.2, 82.2, 163.8, 267.8, 287.3, 101.2, 109.1, 110.1, 111.0, 144.8, 135.4, 84.2, 209.1, 130.1, 136.7, 6
7.7, 200.4, 125.8, 226.3, 120.5, 91.1, 167.9, 257.4, 237.2, 103.0, 153.8, 205.1, 175.7, 154.4, 209.7, 150.0, 199.2, 2
17.6, 175.4, 152.0, 174.9, 176.4, 160.9, 228.7, 144.0, 135.9, 334.3, 130.5, 105.4, 188.9, 111.8, 212.4, 346.8, 113.9,
171.4, 275.4, 197.2, 116.1, 217.3, 207.7, 277.3, 125.3, 216.7, 97.4, 246.4, 143.4, 156.2, 114.8, 232.5, 143.6, 176.7,
263.4, 167.8, 142.5, 133.0, 95.0, 198.6, 142.6, 111.9, 122.8, 189.3, 93.5, 158.6, 243.2, 220.9, 144.4, 212.3, 147.0,
96.2, 12.5, 178.1, 123.0, 208.0, 193.0, 174.5, 116.7, 93.8, 239.5, 167.4, 143.2, 232.8, 162.0, 25.9, 322.3, 191.5, 29
1.1, 208.8, 255.9, 252.7, 132.1, 217.0, 101.9, 211.5, 153.4, 185.2, 104.6, 245.2, 274.4, 98.4, 279.9, 187.2, 276.2, 2
17.8, 190.5, 179.9, 235.9, 144.6, 189.0, 101.0, 165.1, 189.1, 131.5, 166.4, 87.7, 35.1, 246.6, 78.5, 251.6, 270.3, 17
7.3, 262.2, 173.6, 106.6, 209.5, 95.4, 131.6, 112.2, 172.5, 194.3, 307.1, 118.2, 155.5, 125.6, 199.3, 222.2, 92.8, 19
3.2, 113.2, 166.2, 207.8, 245.4, 287.1, 192.3, 141.9, 220.5, 156.0, 235.1, 188.4, 247.8, 221.2, 118.5, 83.5, 183.3, 2
36.8, 134.0, 191.4, 174.8, 275.2, 174.0, 107.9, 221.3, 141.1, 178.6, 139.0, 181.6, 84.9, 217.9, 270.9, 243.0, 150.9,
219.9, 168.0, 256.8, 182.8, 117.6, 145.4, 169.1, 186.4, 76.1, 260.8, 211.8, 162.7, 121.7, 67.4, 229.7, 176.0, 247.7,
115.4, 139.6, 217.5, 196.3, 253.2, 98.0, 249.4, 129.6, 87.6, 203.6, 213.6, 266.3, 115.0, 270.5, 61.9, 189.2, 171.6, 7
8.6, 200.9, 185.1, 254.3, 185.4, 197.8, 153.1, 96.8, 247.0, 321.3, 243.7, 236.9, 148.2, 254.7, 284.4, 0.0, 151.8, 141
.4, 285.7, 58.4, 90.4, 147.7, 302.7, 169.7, 124.2, 132.9, 245.0, 89.5, 186.0, 223.9, 179.5, 112.0, 245.7, 142.8, 202.
4, 236.1, 51.9, 81.3, 115.7, 157.2, 269.7, 132.0, 82.6, 125.5, 82.3, 183.1, 165.7, 176.1, 177.6, 83.2, 235.0, 105.7,
160.3, 95.9, 140.7, 119.7, 99.9, 250.9, 200.6, 198.0, 164.5, 112.6, 226.4, 152.6, 274.9, 195.7, 204.3, 222.5, 174.3,
219.7, 144.9, 236.5, 109.5, 81.6, 133.4, 137.1, 39.5, 199.5, 156.8, 132.4, 63.2, 181.1, 117.5, 218.7, 207.3, 273.3, 2
66.1, 104.7, 168.6, 174.7, 87.0, 204.5, 226.5, 234.1, 133.3, 133.9, 72.8, 196.1, 219.6, 222.9, 115.9, 154.7, 136.4, 2
72.4, 210.0, 153.9, 252.4, 152.4, 237.4, 197.3, 199.1, 233.7, 207.1, 139.7, 177.2, 169.8, 159.9, 115.1, 92.2, 243.9,
117.1, 223.3, 154.8, 46.5, 242.2, 259.4, 69.4, 156.5, 61.2, 102.3, 219.4, 137.2, 271.1, 103.4, 52.2, 235.7, 103.7, 14
8.4, 191.1, 218.5, 97.5, 128.7, 236.6, 85.9, 141.2, 216.4, 118.7, 209.2, 244.3, 197.4, 185.6, 137.6, 273.9, 242.3, 25
4.1, 115.5, 132.7, 236.4, 179.8, 119.2, 224.0, 19.5, 184.8, 122.5, 226.9, 204.8, 158.1, 225.2, 159.4, 54.8, 283.1, 29
1.8, 222.7, 68.4, 273.0, 225.3, 283.2, 131.4, 105.9, 247.3, 193.1, 241.0, 134.8, 163.1, 329.8, 131.9, 99.7, 37.8, 94.
8, 269.0, 268.3, 198.7, 201.7, 293.7, 120.3, 278.5, 273.8, 131.1, 197.7, 129.7, 200.0, 152.8, 268.4, 188.5, 170.6, 75
.3, 131.7, 101.4, 107.5, 157.7, 286.4, 173.0, 268.7, 255.3, 41.9, 239.4, 113.1, 182.7, 202.7, 190.8, 132.6, 122.0, 91
.5, 153.6, 244.7, 172.4, 157.3, 135.8, 160.7, 202.5, 191.6, 138.9, 286.6, 164.6, 141.6, 163.2, 254.2, 109.7, 277.0, 1
39.2, 121.6, 270.4, 203.3, 215.1, 301.7, 152.3, 208.7, 190.1, 54.2, 230.3, 240.8, 276.1, 179.7, 165.8, 144.1, 199.8,
171.8, 245.8, 195.1, 81.9, 239.0, 152.5, 295.4, 272.7, 236.7, 111.4, 153.0, 218.8, 205.4, 225.4, 275.8, 142.9, 210.3,
225.7, 80.3, 231.7, 188.8, 163.7, 70.8, 101.7, 258.4, 242.4, 188.0, 250.6, 260.1, 281.3, 128.5, 172.2, 230.4, 129.3,
238.0, 211.1, 212.8, 191.8, 108.0, 174.6, 150.3, 157.8, 237.8, 204.0, 118.0, 272.5, 118.9, 7.9, 150.2, 144.5, 220.8,
216.3, 266.0, 96.7, 82.7, 204.6, 253.1, 130.0, 261.9, 240.2, 154.5, 328.1, 145.9, 139.1, 240.1, 83.8, 269.8, 88.1, 18
4.2, 149.2, 204.7, 213.2, 269.6, 140.2, 136.2, 88.5, 215.3, 269.2, 160.5, 228.9, 224.2, 148.3, 138.5, 109.0, 210.8, 1
42.4, 193.6, 192.4, 233.2, 126.1, 290.4, 60.6, 298.1, 222.1, 136.6, 289.8, 260.9, 196.2, 172.9, 249.8, 268.8, 106.1,
```

```
27.0, 196.7, 149.6, 206.1, 199.9, 213.1, 252.3, 111.1, 96.5, 156.9, 123.3, 197.6, 270.0, 47.7, 182.6, 231.5, 251.3, 1
77.4, 47.8, 121.8, 101.1, 92.3, 168.9, 146.5, 190.9, 123.8, 96.0, 93.4, 90.6, 152.9, 257.9, 85.2, 152.1, 278.9, 303.2
, 238.9, 92.7, 137.3, 203.7, 88.8, 137.9, 224.3, 268.1, 267.1, 37.7, 239.3, 134.9, 239.1, 92.6, 17.6, 276.5, 313.8, 2
88.5, 210.9, 64.9, 243.5, 313.2, 75.8, 195.9, 171.9, 228.4, 227.1, 271.7, 245.5, 245.3, 134.1, 92.4, 159.6, 49.9, 116
.9, 270.7, 145.3, 230.7, 151.5, 146.1, 256.0, 200.2, 212.9, 230.5, 253.5, 98.8, 129.0, 86.0, 193.9, 109.4, 195.5, 264
.4, 141.5, 133.5, 273.2, 224.6, 104.0, 116.4, 129.4, 161.8, 147.8, 262.3, 259.7, 51.8, 164.3, 154.3, 122.9, 297.9, 12
5.4, 247.5, 294.9, 126.8, 143.0, 91.9, 86.5, 109.9, 326.3, 110.0, 105.3, 111.7, 81.7, 128.1, 55.6, 232.6, 102.7, 263.
1, 201.5, 251.0, 109.8, 279.5, 173.4, 96.1, 109.2, 183.5, 227.8, 305.2, 197.5, 181.3, 262.9, 160.8, 141.8, 50.6, 252.
1, 230.1, 73.8, 145.1, 135.2, 124.7, 144.3, 235.2, 218.6, 265.2, 184.7, 115.3, 113.0, 294.2, 71.2, 94.9, 215.8, 139.9
, 153.2, 103.5, 182.2, 185.7, 222.6, 108.3, 247.2, 118.4, 317.8, 123.2, 164.1, 345.3, 264.9, 208.4, 162.4, 281.2, 232
.9, 234.7, 240.0, 298.4, 111.6, 207.5, 258.8, 156.7, 150.8, 322.4, 180.5, 274.7, 142.0, 232.7, 288.0, 216.1, 227.0, 2
45.9, 257.3, 301.5, 233.9, 99.6, 116.2, 140.5, 277.9, 308.6, 242.6, 213.5, 240.7, 314.1, 255.1, 49.2, 40.4, 291.2, 18
6.5, 163.3, 295.3, 114.1, 279.1, 255.8, 169.0, 2.6, 181.9, 274.0, 229.9, 139.3, 7.8, 140.0, 237.3, 51.5, 116.0, 106.5
, 218.4, 227.5, 185.9, 111.2, 244.1, 127.4, 54.7, 283.4, 258.0, 90.5, 54.0, 264.0, 220.4, 221.9, 263.7, 61.3, 324.7,
129.2, 257.2, 124.6, 175.1, 78.7, 211.9, 63.7, 237.7, 225.9, 137.0, 220.3, 308.0, 58.0, 90.0, 86.1, 296.0, 146.6, 260
.5, 124.5, 77.6, 138.8, 164.0, 90.7, 108.6, 89.8, 279.3, 210.1, 113.6, 127.8, 99.4, 276.9, 163.4, 287.4, 158.4, 288.8
, 102.1, 177.7, 250.8, 233.3, 180.2, 234.9, 233.5, 135.7, 122.2, 153.3, 122.3, 259.3, 194.9, 44.9, 262.8, 171.1, 178.
5, 203.0, 242.8, 182.0, 118.6, 161.7, 248.9, 158.9, 93.3, 18.9, 130.6, 94.2, 189.4, 222.0, 271.8, 100.0, 305.1, 72.5,
105.2, 86.8, 78.3, 97.1, 291.6, 247.6, 113.3, 146.9, 96.3, 280.4, 173.7, 113.8, 184.4, 223.8, 143.8, 29.9, 276.7, 181
.2, 247.4, 107.2, 294.7, 306.2, 238.8, 251.9, 264.5, 141.0, 140.8, 125.0, 103.2, 138.4, 274.6, 286.2, 268.0, 142.2, 9
7.8, 266.9, 289.1, 180.3, 295.0, 240.9, 107.3, 238.4, 51.1, 227.7, 78.1, 280.0, 224.1, 124.9, 321.1, 231.1, 180.8]

 Unique values for total day calls
 N-unique values for total day calls is 119
[110, 123, 114, 71, 113, 98, 88, 79, 97, 84, 137, 127, 96, 70, 67, 139, 66, 90, 117, 89, 112, 103, 86, 76, 115, 73, 1
09, 95, 105, 121, 118, 94, 80, 128, 64, 106, 102, 85, 82, 77, 120, 133, 135, 108, 57, 83, 129, 91, 92, 74, 93, 101, 1
46, 72, 99, 104, 125, 61, 100, 87, 131, 65, 124, 119, 52, 68, 107, 47, 116, 151, 126, 122, 111, 145, 78, 136, 140, 14
8, 81, 55, 69, 158, 134, 130, 63, 53, 75, 141, 163, 59, 132, 138, 54, 58, 62, 144, 143, 147, 36, 40, 150, 56, 51, 165
, 30, 48, 60, 42, 0, 45, 160, 149, 152, 142, 156, 35, 49, 157, 44]

 Unique values for total day charge
 N-unique values for total day charge is 1667
[45.07, 27.47, 41.38, 50.9, 28.34, 37.98, 37.09, 26.69, 31.37, 43.96, 21.95, 31.91, 21.9, 26.62, 20.52, 56.59, 33.39,
32.42, 32.25, 38.15, 26.37, 10.61, 31.11, 18.77, 13.79, 21.13, 36.21, 22.83, 32.3, 20.28, 14.42, 38.44, 36.04, 42.43,
30.06, 37.4, 24.87, 22.24, 34.66, 23.87, 21.47, 29.43, 21.22, 14.59, 26.18, 20.55, 35.92, 31.79, 27.05, 22.64, 32.62,
37.5, 31.64, 27.23, 25.67, 29.84, 21.57, 33.73, 25.3, 38.98, 32.66, 45.66, 32.93, 30.72, 22.3, 25.18, 42.76, 21.28, 3
5.97, 30.41, 41.11, 38.23, 42.26, 34.58, 40.09, 26.71, 51.05, 10.47, 36.4, 28.93, 34.19, 36.62, 28.15, 42.42, 35.8, 3
0.48, 26.84, 36.43, 26.2, 40.44, 24.46, 42.99, 30.45, 47.33, 27.22, 33.69, 36.06, 42.81, 27.4, 30.31, 25.79, 22.95, 2
8.99, 40.48, 47.84, 20.04, 25.26, 39.07, 28.05, 31.45, 27.37, 21.54, 10.01, 33.46, 27.64, 48.03, 19.33, 40.77, 35.73,
36.35, 29.05, 26.21, 34.24, 12.02, 31.88, 15.59, 36.41, 24.74, 28.27, 39.27, 34.05, 33.49, 22.08, 29.89, 34.53, 31.14
, 34.85, 25.25, 32.74, 41.91, 28.41, 39.42, 24.94, 46.16, 30.86, 43.81, 32.95, 17.48, 31.94, 38.42, 44.27, 30.38, 57.
36, 26.79, 31.21, 24.16, 23.17, 36.91, 16.81, 35.07, 41.33, 32.27, 34.34, 28.92, 39.25, 40.31, 30.96, 19.86, 37.26, 4
```

```
2.94, 25.01, 34.36, 29.5, 39.46, 33.51, 9.89, 19.65, 44.18, 26.98, 46.17, 27.3, 39.51, 22.75, 30.07, 35.68, 23.38, 49
.22, 33.68, 25.45, 55.51, 49.79, 14.11, 24.77, 30.99, 37.06, 23.9, 25.96, 18.14, 41.45, 33.05, 36.36, 36.92, 40.99, 3
4.6, 26.38, 28.49, 38.54, 25.74, 30.6, 42.53, 37.91, 28.22, 23.14, 25.38, 11.12, 36.28, 35.17, 31.65, 47.63, 33.42, 5
3.04, 33.83, 28.7, 22.85, 34.44, 12.67, 14.21, 32.67, 37.43, 22.97, 43.08, 38.25, 33.75, 18.75, 10.2, 36.52, 30.91, 2
6.76, 35.34, 35.19, 20.23, 24.43, 28.2, 23.56, 14.4, 10.64, 28.03, 22.87, 24.36, 28.61, 44.61, 35.05, 38.39, 23.51, 1
6.05, 27.2, 35.12, 22.9, 36.45, 32.78, 25.69, 37.64, 37.21, 32.76, 34.75, 29.29, 35.99, 37.67, 33.64, 25.08, 35.09, 3
5.0, 35.29, 51.66, 39.2, 16.92, 30.11, 29.36, 34.71, 14.57, 36.64, 29.19, 45.32, 28.97, 26.86, 15.64, 39.78, 46.26, 5
0.39, 38.62, 42.28, 40.17, 34.95, 16.0, 10.27, 20.57, 20.03, 38.0, 29.97, 23.58, 14.67, 10.0, 11.68, 40.66, 33.71, 34
.88, 46.34, 21.81, 28.83, 34.22, 36.5, 28.76, 33.0, 39.75, 38.27, 31.26, 37.71, 10.98, 26.28, 44.23, 26.5, 18.19, 31.
03, 37.42, 25.87, 40.15, 28.24, 41.58, 22.81, 25.52, 43.71, 21.15, 24.09, 39.1, 27.59, 59.64, 32.86, 13.29, 14.18, 33
.25, 34.31, 28.02, 30.46, 36.38, 34.97, 28.14, 37.57, 41.16, 25.77, 29.95, 33.32, 27.12, 39.13, 35.79, 17.34, 21.42,
28.63, 17.95, 35.11, 39.03, 47.31, 39.85, 28.44, 37.59, 24.79, 37.88, 31.18, 44.93, 24.82, 21.64, 30.4, 16.52, 44.17,
43.61, 28.82, 40.75, 29.16, 40.78, 24.19, 31.3, 34.65, 42.3, 32.79, 20.81, 17.83, 29.44, 20.3, 42.55, 26.35, 49.08, 4
0.87, 32.35, 47.26, 26.1, 46.48, 26.4, 22.63, 41.96, 28.12, 10.12, 48.74, 19.94, 21.74, 38.34, 25.33, 33.81, 43.59, 4
5.02, 16.69, 27.17, 32.4, 31.28, 44.51, 25.14, 18.09, 22.73, 32.9, 30.29, 38.45, 12.05, 40.85, 12.75, 11.75, 16.42, 3
6.48, 43.88, 25.47, 32.37, 30.84, 26.47, 25.48, 37.79, 25.4, 41.29, 25.57, 35.51, 22.22, 20.33, 46.51, 26.54, 30.18,
29.78, 19.43, 42.74, 36.87, 27.08, 24.33, 31.72, 29.04, 21.08, 29.38, 36.96, 45.2, 15.91, 28.59, 34.49, 44.44, 12.46,
43.13, 7.65, 39.32, 8.06, 38.66, 6.95, 11.65, 27.8, 27.71, 36.33, 52.77, 8.23, 29.1, 28.31, 36.82, 18.33, 24.02, 40.3
8, 39.87, 17.53, 22.02, 47.57, 23.26, 17.02, 38.17, 48.98, 25.28, 33.08, 33.07, 29.6, 22.41, 24.96, 34.12, 24.75, 39.
0, 35.87, 20.66, 36.72, 49.81, 12.63, 10.59, 38.86, 38.78, 52.68, 34.32, 31.25, 31.74, 35.6, 37.94, 27.91, 25.59, 39.
81, 9.4, 15.25, 13.63, 21.37, 35.22, 26.78, 27.27, 27.03, 17.44, 27.15, 34.48, 9.78, 28.88, 57.04, 23.72, 31.93, 24.8
5, 39.41, 26.59, 37.52, 29.24, 21.79, 22.13, 33.22, 49.86, 32.52, 35.63, 36.67, 27.44, 24.51, 43.55, 19.16, 50.92, 33
.12, 17.14, 14.03, 24.89, 30.24, 25.62, 30.62, 45.1, 21.86, 27.46, 28.1, 33.15, 34.94, 40.05, 32.64, 44.49, 40.04, 44
.85, 29.85, 41.23, 23.48, 45.0, 47.99, 35.9, 34.9, 42.84, 39.3, 34.02, 45.34, 20.08, 29.8, 21.27, 41.12, 41.0, 37.81,
32.22, 20.93, 43.64, 5.25, 31.86, 53.65, 47.18, 25.02, 31.59, 26.42, 16.59, 35.02, 36.86, 17.56, 23.7, 32.5, 37.69, 1
0.69, 36.65, 16.1, 34.54, 33.2, 19.45, 29.9, 42.48, 35.82, 14.82, 23.36, 38.22, 44.4, 33.41, 46.1, 51.07, 9.71, 27.56
, 24.65, 5.78, 32.88, 32.59, 27.42, 25.6, 31.38, 20.59, 18.63, 28.48, 19.69, 47.02, 30.5, 31.84, 34.2, 32.23, 31.76,
31.89, 41.63, 31.81, 29.02, 27.39, 28.8, 43.25, 21.71, 37.25, 46.5, 27.52, 41.09, 10.68, 47.79, 38.79, 35.67, 45.15,
36.53, 18.79, 23.43, 19.18, 30.67, 26.13, 44.42, 41.85, 32.47, 35.41, 43.01, 34.39, 29.65, 21.61, 24.4, 31.77, 32.98,
39.92, 21.03, 29.56, 22.25, 53.48, 38.74, 16.24, 31.5, 17.99, 30.26, 29.26, 28.78, 20.25, 33.01, 33.8, 28.51, 34.37,
54.83, 36.75, 12.99, 12.36, 35.77, 21.62, 37.32, 16.88, 38.2, 30.02, 48.26, 30.7, 21.4, 40.39, 46.63, 33.93, 37.01, 3
6.16, 43.57, 45.54, 27.81, 30.75, 17.85, 46.14, 35.14, 28.36, 34.83, 21.59, 45.46, 47.77, 46.04, 21.1, 27.68, 43.32,
43.33, 18.31, 27.0, 31.09, 30.33, 18.85, 28.37, 41.62, 20.54, 36.7, 23.82, 23.77, 54.67, 28.32, 44.2, 32.33, 13.97, 2
7.85, 45.53, 48.84, 17.2, 18.55, 18.72, 18.87, 24.62, 23.02, 14.31, 35.55, 22.12, 23.24, 11.51, 34.07, 21.39, 38.47,
20.49, 15.49, 28.54, 43.76, 40.32, 17.51, 26.15, 34.87, 29.87, 26.25, 35.65, 25.5, 33.86, 36.99, 29.82, 25.84, 29.73,
29.99, 27.35, 38.88, 24.48, 23.1, 56.83, 22.19, 17.92, 32.11, 19.01, 36.11, 58.96, 19.36, 29.14, 46.82, 33.52, 19.74,
36.94, 35.31, 47.14, 21.3, 36.84, 16.56, 41.89, 24.38, 26.55, 19.52, 39.53, 24.41, 30.04, 44.78, 28.53, 24.23, 22.61,
16.15, 33.76, 24.24, 19.02, 20.88, 32.18, 15.9, 26.96, 41.34, 37.55, 24.55, 36.09, 24.99, 16.35, 2.13, 30.28, 20.91,
35.36, 32.81, 29.67, 19.84, 15.95, 40.72, 28.46, 24.34, 39.58, 27.54, 4.4, 54.79, 32.56, 49.49, 35.5, 43.5, 42.96, 22
.46, 36.89, 17.32, 35.96, 26.08, 31.48, 17.78, 41.68, 46.65, 16.73, 47.58, 31.82, 46.95, 37.03, 32.39, 30.58, 40.1, 2
4.58, 32.13, 17.17, 28.07, 32.15, 22.36, 28.29, 14.91, 5.97, 41.92, 13.35, 42.77, 45.95, 30.14, 44.57, 29.51, 18.12,
35.62, 16.22, 22.37, 19.07, 29.33, 33.03, 52.21, 20.09, 26.44, 21.35, 33.88, 37.77, 15.78, 32.84, 19.24, 28.25, 35.33
```

```
, 41.72, 48.81, 32.69, 24.12, 37.49, 26.52, 39.97, 32.03, 42.13, 37.6, 20.15, 14.2, 31.16, 40.26, 22.78, 32.54, 29.72
, 46.78, 29.58, 18.34, 37.62, 23.99, 30.36, 23.63, 30.87, 14.43, 37.04, 46.05, 41.31, 25.65, 37.38, 28.56, 43.66, 31.
08, 19.99, 24.72, 28.75, 31.69, 12.94, 44.34, 36.01, 27.66, 20.69, 11.46, 39.05, 29.92, 42.11, 19.62, 23.73, 36.98, 3
3.37, 43.04, 16.66, 42.4, 22.03, 14.89, 34.61, 36.31, 45.27, 19.55, 45.99, 10.52, 32.16, 29.17, 13.36, 34.15, 31.47,
43.23, 31.52, 33.63, 26.03, 16.46, 41.99, 54.62, 41.43, 40.27, 25.19, 43.3, 48.35, 0.0, 25.81, 24.04, 48.57, 9.93, 15
.37, 25.11, 51.46, 28.85, 21.11, 22.59, 41.65, 15.22, 31.62, 38.06, 30.52, 19.04, 41.77, 24.28, 34.41, 40.14, 8.82, 1
3.82, 19.67, 26.72, 45.85, 22.44, 14.04, 21.34, 13.99, 31.13, 28.17, 29.94, 30.19, 14.14, 39.95, 17.97, 27.25, 16.3,
23.92, 20.35, 16.98, 42.65, 34.1, 33.66, 27.97, 19.14, 38.49, 25.94, 46.73, 33.27, 34.73, 37.83, 29.63, 37.35, 24.63,
40.21, 18.62, 13.87, 22.68, 23.31, 6.72, 33.92, 26.66, 22.51, 10.74, 30.79, 19.98, 37.18, 35.24, 46.46, 45.24, 17.8,
28.66, 29.7, 14.79, 34.77, 38.51, 39.8, 22.66, 22.76, 12.38, 33.34, 37.33, 37.89, 19.7, 26.3, 23.19, 46.31, 35.7, 26.
16, 42.91, 25.91, 40.36, 33.54, 33.85, 39.73, 35.21, 23.75, 30.12, 28.87, 27.18, 19.57, 15.67, 41.46, 19.91, 37.96, 2
6.32, 7.91, 41.17, 44.1, 11.8, 26.61, 10.4, 17.39, 37.3, 23.32, 46.09, 17.58, 8.87, 40.07, 17.63, 25.23, 32.49, 37.15
, 16.58, 21.88, 40.22, 14.6, 24.0, 36.79, 20.18, 35.56, 41.53, 33.56, 31.55, 23.39, 46.56, 41.19, 43.2, 19.64, 22.56,
40.19, 30.57, 20.26, 38.08, 3.32, 31.42, 20.83, 38.57, 34.82, 26.88, 38.28, 27.1, 9.32, 48.13, 49.61, 37.86, 11.63, 4
6.41, 38.3, 48.14, 22.34, 18.0, 42.04, 32.83, 40.97, 22.92, 27.73, 56.07, 22.42, 16.95, 6.43, 16.12, 45.73, 45.61, 33
.78, 34.29, 49.93, 20.45, 47.35, 46.55, 22.29, 33.61, 22.05, 34.0, 25.98, 45.63, 32.05, 29.0, 12.8, 22.39, 17.24, 18.
28, 26.81, 48.69, 29.41, 45.68, 43.4, 7.12, 40.7, 19.23, 31.06, 34.46, 32.44, 22.54, 20.74, 15.56, 26.11, 41.6, 29.31
, 26.74, 23.09, 27.32, 34.43, 32.57, 23.61, 48.72, 27.98, 24.07, 27.74, 43.21, 18.65, 47.09, 23.66, 20.67, 45.97, 34.
56, 36.57, 51.29, 25.89, 35.48, 32.32, 9.21, 39.15, 40.94, 46.94, 30.55, 28.19, 24.5, 33.97, 29.21, 41.79, 33.17, 13.
92, 40.63, 25.93, 50.22, 46.36, 40.24, 18.94, 26.01, 37.2, 34.92, 38.32, 46.89, 24.29, 35.75, 38.37, 13.65, 39.39, 32
.1, 27.83, 12.04, 17.29, 43.93, 41.21, 31.96, 42.6, 44.22, 47.82, 21.85, 29.27, 39.17, 21.98, 40.46, 35.89, 36.18, 32
.61, 18.36, 29.68, 25.55, 26.83, 40.43, 34.68, 20.06, 46.33, 20.21, 1.34, 25.53, 24.57, 37.54, 36.77, 45.22, 16.44, 1
4.06, 34.78, 43.03, 22.1, 44.52, 40.83, 26.27, 55.78, 24.8, 23.65, 40.82, 14.25, 45.87, 14.98, 31.31, 25.36, 34.8, 36
.24, 45.83, 23.83, 23.15, 15.05, 36.6, 45.76, 27.29, 38.91, 38.11, 25.21, 23.55, 18.53, 35.84, 24.21, 32.91, 32.71, 3
9.64, 21.44, 49.37, 10.3, 50.68, 37.76, 23.22, 49.27, 44.35, 33.35, 29.39, 42.47, 45.7, 18.04, 4.59, 33.44, 25.43, 35
.04, 33.98, 36.23, 42.89, 18.89, 16.41, 26.67, 20.96, 33.59, 45.9, 8.11, 31.04, 39.36, 42.72, 30.16, 8.13, 20.71, 17.
19, 15.69, 28.71, 24.91, 32.45, 21.05, 16.32, 15.88, 15.4, 25.99, 43.84, 14.48, 25.86, 47.41, 51.54, 40.61, 15.76, 23
.34, 34.63, 15.1, 23.44, 38.13, 45.58, 45.41, 6.41, 40.68, 22.93, 40.65, 15.74, 2.99, 47.01, 53.35, 49.05, 35.85, 11.
03, 41.4, 53.24, 12.89, 33.3, 29.22, 38.83, 38.61, 46.19, 41.74, 41.7, 22.8, 15.71, 27.13, 8.48, 19.87, 46.02, 24.7,
39.22, 25.76, 24.84, 43.52, 34.03, 36.19, 39.19, 43.1, 16.8, 21.93, 14.62, 32.96, 18.6, 33.24, 44.95, 24.06, 22.7, 46
.44, 38.18, 17.68, 19.79, 22.0, 27.51, 25.13, 44.59, 44.15, 8.81, 27.93, 26.23, 20.89, 50.64, 21.32, 42.08, 50.13, 21
.56, 24.31, 15.62, 14.71, 18.68, 55.47, 18.7, 17.9, 18.99, 13.89, 21.78, 9.45, 39.54, 17.46, 44.73, 34.26, 42.67, 18.
67, 47.52, 29.48, 16.34, 18.56, 31.2, 38.73, 51.88, 33.58, 30.82, 44.69, 27.34, 24.11, 8.6, 42.86, 39.12, 12.55, 24.6
7, 22.98, 21.2, 24.53, 39.98, 37.16, 45.08, 31.4, 19.6, 19.21, 50.01, 12.1, 16.13, 36.69, 23.78, 26.04, 17.6, 30.97,
31.57, 37.84, 18.41, 42.02, 20.13, 54.03, 20.94, 27.9, 58.7, 45.03, 35.43, 27.61, 47.8, 39.59, 39.9, 40.8, 50.73, 18.
97, 35.28, 44.0, 26.64, 25.64, 54.81, 30.69, 46.7, 24.14, 39.56, 48.96, 36.74, 38.59, 41.8, 43.74, 51.26, 39.76, 16.9
3, 19.75, 23.89, 47.24, 52.46, 41.24, 36.3, 40.92, 53.4, 43.37, 8.36, 6.87, 49.5, 31.71, 27.76, 50.2, 19.4, 47.45, 43
.49, 28.73, 0.44, 30.92, 46.58, 39.08, 23.68, 1.33, 23.8, 40.34, 8.76, 19.72, 18.11, 37.13, 38.68, 31.6, 18.9, 41.5,
21.66, 9.3, 48.18, 43.86, 15.39, 9.18, 44.88, 37.47, 37.72, 44.83, 10.42, 55.2, 21.96, 43.72, 21.18, 29.77, 13.38, 36
.02, 10.83, 40.41, 38.4, 23.29, 37.45, 52.36, 9.86, 15.3, 14.64, 50.32, 24.92, 44.29, 21.17, 13.19, 23.6, 27.88, 15.4
2, 18.46, 15.27, 47.48, 35.72, 19.31, 21.73, 16.9, 47.07, 27.78, 48.86, 26.93, 49.1, 17.36, 30.21, 42.64, 39.66, 30.6
3, 39.93, 39.7, 23.07, 20.77, 26.06, 20.79, 44.08, 33.13, 7.63, 44.68, 29.09, 30.35, 34.51, 41.28, 30.94, 20.16, 27.4
```

```
9, 42.31, 27.01, 15.86, 3.21, 22.2, 16.01, 32.2, 37.74, 46.21, 17.0, 51.87, 12.33, 17.88, 14.76, 13.31, 16.51, 49.57,
42.09, 19.26, 24.97, 16.37, 47.67, 29.53, 19.35, 31.35, 38.05, 24.45, 5.08, 47.04, 30.8, 42.06, 18.22, 50.1, 52.05, 4
0.6, 42.82, 44.97, 23.97, 23.94, 21.25, 17.54, 23.53, 46.68, 48.65, 45.56, 24.17, 16.63, 45.37, 49.15, 30.65, 50.15,
40.95, 18.24, 40.53, 8.69, 38.71, 13.28, 47.6, 38.1, 21.23, 54.59, 39.29, 30.74]

 Unique values for total eve minutes
 N-unique values for total eve minutes is 1611
[197.4, 195.5, 121.2, 61.9, 148.3, 220.6, 348.5, 103.1, 351.6, 222.0, 228.5, 163.4, 104.9, 247.6, 307.2, 317.8, 280.9
, 218.2, 212.8, 159.5, 239.7, 169.9, 72.9, 137.3, 245.2, 277.1, 191.1, 155.5, 258.2, 215.1, 136.7, 201.5, 31.2, 252.4
, 195.0, 217.3, 162.5, 223.7, 187.6, 271.8, 166.8, 203.9, 282.2, 165.3, 225.8, 213.0, 162.6, 134.6, 231.3, 217.2, 269
.8, 211.1, 190.2, 267.5, 219.7, 249.3, 180.0, 75.3, 246.5, 177.4, 178.2, 246.1, 187.8, 162.9, 169.5, 206.4, 216.9, 16
9.1, 170.5, 188.2, 148.9, 226.7, 157.2, 223.3, 181.0, 77.1, 164.4, 155.2, 303.5, 204.8, 136.1, 259.7, 249.2, 225.9, 1
55.0, 208.5, 123.4, 194.9, 190.9, 173.0, 178.4, 190.6, 81.0, 213.3, 207.3, 209.4, 205.7, 252.2, 189.0, 119.0, 183.6,
173.7, 187.2, 202.2, 164.5, 131.1, 147.9, 317.2, 206.0, 169.6, 254.9, 152.3, 219.9, 157.5, 214.8, 227.3, 141.8, 183.5
, 132.3, 110.2, 229.4, 146.6, 193.7, 161.7, 217.7, 158.2, 230.4, 201.2, 202.6, 173.3, 217.5, 210.1, 126.8, 152.0, 276
.4, 220.4, 177.5, 160.1, 203.5, 216.3, 218.4, 162.1, 221.4, 206.7, 157.6, 248.5, 146.0, 292.1, 227.4, 247.0, 256.7, 1
83.4, 172.2, 241.5, 241.4, 135.4, 148.6, 213.8, 163.3, 243.2, 193.3, 187.4, 223.5, 169.7, 211.5, 178.9, 149.4, 169.0,
190.4, 194.1, 292.3, 214.5, 138.7, 237.7, 254.3, 245.0, 268.5, 64.3, 163.2, 180.5, 90.7, 195.1, 203.2, 166.6, 177.0,
182.2, 176.3, 199.7, 220.5, 328.2, 184.0, 178.6, 257.5, 209.8, 83.9, 186.7, 151.9, 246.7, 155.6, 244.5, 113.0, 228.1,
186.4, 224.2, 267.1, 110.1, 152.6, 174.5, 272.9, 242.2, 168.2, 234.5, 244.7, 189.6, 313.2, 129.4, 291.3, 217.0, 220.3
, 240.3, 211.3, 118.8, 200.8, 120.9, 168.6, 88.3, 134.1, 182.4, 176.9, 267.8, 166.5, 102.2, 149.7, 202.4, 278.0, 117.
9, 172.0, 232.9, 230.0, 273.0, 216.5, 172.3, 249.9, 180.6, 235.3, 209.3, 143.1, 221.2, 194.6, 260.0, 193.0, 136.2, 17
5.4, 224.9, 235.2, 234.4, 194.8, 231.8, 208.0, 219.1, 174.0, 210.9, 159.9, 288.4, 181.5, 175.7, 128.0, 132.4, 260.9,
219.4, 129.1, 194.0, 120.1, 133.4, 179.9, 247.7, 184.3, 218.7, 199.9, 110.4, 264.8, 350.5, 292.5, 253.6, 249.5, 190.3
, 258.4, 220.0, 195.9, 280.3, 205.4, 306.2, 270.4, 256.8, 211.9, 188.8, 259.2, 177.8, 256.9, 246.6, 154.9, 219.5, 209
.2, 235.5, 217.1, 240.6, 312.9, 248.7, 197.1, 264.1, 152.8, 138.5, 271.5, 176.6, 266.5, 199.2, 255.9, 176.1, 83.4, 17
9.2, 123.0, 162.3, 105.7, 204.7, 234.3, 177.2, 205.1, 218.6, 79.3, 264.7, 312.2, 179.7, 232.3, 103.2, 213.7, 253.4, 2
32.2, 225.0, 222.8, 114.4, 229.9, 210.7, 118.2, 286.2, 160.7, 191.0, 155.4, 145.0, 322.7, 247.1, 274.0, 204.5, 270.2,
238.5, 243.8, 176.2, 205.2, 93.4, 199.0, 279.3, 130.7, 218.9, 110.8, 192.2, 242.0, 160.9, 109.7, 184.9, 251.3, 197.0,
141.2, 186.2, 242.3, 199.5, 124.0, 282.9, 160.0, 174.8, 327.0, 264.4, 283.1, 140.3, 130.2, 185.5, 113.4, 196.8, 273.3
, 260.6, 282.6, 182.1, 175.3, 203.8, 118.9, 301.3, 176.7, 330.6, 197.6, 154.0, 265.7, 196.0, 257.2, 236.0, 134.4, 201
.1, 202.8, 271.2, 246.3, 245.3, 273.9, 245.4, 264.0, 220.1, 120.4, 228.4, 108.1, 195.3, 220.2, 167.8, 181.6, 200.2, 1
66.7, 164.6, 136.3, 315.4, 235.1, 146.5, 161.4, 158.1, 253.8, 256.1, 231.5, 131.8, 221.6, 292.6, 230.5, 278.7, 114.6,
180.3, 287.4, 105.6, 244.4, 225.1, 207.4, 145.5, 125.9, 236.6, 329.8, 202.9, 215.8, 193.8, 158.6, 224.7, 153.8, 154.5
, 229.2, 151.3, 171.7, 182.5, 157.3, 337.1, 203.1, 253.0, 42.2, 66.5, 281.1, 145.7, 183.0, 190.8, 216.6, 168.0, 158.0
, 243.0, 248.9, 205.6, 183.1, 200.7, 258.0, 259.0, 119.9, 303.8, 251.1, 237.0, 310.0, 264.2, 98.3, 257.4, 271.4, 160.
6, 264.9, 196.9, 177.3, 275.0, 276.5, 200.3, 226.8, 229.7, 335.0, 347.3, 183.2, 193.1, 293.1, 164.7, 58.9, 260.1, 219
.0, 299.9, 207.6, 254.1, 161.9, 152.4, 102.6, 167.9, 200.9, 246.0, 197.5, 165.8, 265.5, 225.2, 212.5, 289.3, 118.7, 2
48.6, 261.5, 150.6, 154.2, 233.4, 221.9, 274.5, 290.9, 154.6, 188.5, 193.9, 143.8, 146.9, 146.3, 185.3, 170.9, 289.9,
89.7, 224.6, 197.3, 127.5, 147.6, 134.0, 173.5, 198.5, 210.5, 265.1, 219.3, 177.9, 227.9, 127.6, 101.3, 210.6, 204.9,
127.8, 103.4, 161.8, 102.8, 131.4, 305.0, 130.1, 150.2, 188.7, 188.9, 221.5, 144.3, 248.8, 116.5, 181.2, 189.8, 158.4
, 150.5, 241.6, 233.3, 187.0, 214.4, 208.9, 192.8, 268.6, 105.5, 273.6, 186.0, 159.1, 163.9, 189.4, 231.0, 154.4, 152
```

```
.5, 216.7, 297.8, 78.3, 203.0, 211.7, 242.5, 195.2, 219.2, 194.5, 163.7, 169.3, 193.4, 237.6, 170.7, 190.0, 214.2, 17
5.8, 133.2, 169.8, 240.8, 208.6, 189.1, 278.6, 163.5, 250.3, 137.6, 121.9, 242.1, 239.8, 243.3, 181.1, 270.8, 227.2,
267.4, 261.0, 208.2, 118.0, 223.0, 250.2, 166.9, 207.0, 198.8, 197.2, 215.0, 242.9, 183.8, 142.0, 170.4, 143.7, 263.7
, 208.8, 117.8, 223.2, 198.0, 286.3, 218.8, 269.3, 259.4, 137.8, 220.9, 318.8, 156.3, 172.1, 242.6, 240.0, 106.8, 103
.0, 203.4, 207.5, 202.7, 76.4, 43.9, 123.9, 132.5, 217.9, 287.7, 173.4, 230.1, 93.7, 216.8, 204.6, 215.6, 115.6, 225.
5, 304.9, 222.1, 270.5, 150.0, 235.0, 162.7, 192.0, 196.4, 192.4, 52.9, 211.4, 273.5, 235.9, 180.2, 120.7, 165.4, 175
.2, 196.5, 146.7, 152.7, 183.7, 171.3, 268.2, 154.3, 241.3, 209.5, 251.6, 174.6, 135.2, 245.6, 323.2, 204.2, 185.6, 2
90.3, 143.4, 239.6, 42.5, 233.6, 158.5, 60.8, 210.0, 200.6, 209.6, 249.8, 138.2, 70.9, 109.6, 166.4, 316.4, 289.8, 28
8.0, 141.6, 281.7, 115.7, 128.7, 219.8, 142.3, 112.5, 205.9, 80.8, 106.1, 145.2, 228.6, 195.7, 309.2, 207.7, 233.9, 1
89.7, 179.3, 287.3, 206.9, 190.7, 261.1, 222.6, 234.0, 160.5, 285.9, 187.3, 320.5, 150.1, 248.1, 258.8, 248.2, 262.2,
251.2, 163.0, 271.0, 192.1, 131.2, 266.4, 149.8, 306.3, 145.3, 263.3, 115.2, 187.5, 234.1, 201.8, 216.1, 232.5, 164.8
, 167.6, 167.3, 317.5, 203.6, 167.7, 256.2, 289.4, 81.9, 205.5, 244.1, 230.3, 148.5, 262.8, 284.3, 291.2, 249.4, 215.
9, 171.8, 140.9, 213.9, 165.0, 114.0, 211.2, 147.0, 158.8, 165.7, 179.1, 256.6, 58.6, 97.6, 133.9, 198.9, 89.8, 145.9
, 224.1, 233.2, 218.1, 209.1, 240.5, 151.5, 247.5, 206.5, 112.3, 221.3, 216.2, 204.1, 221.1, 223.1, 184.6, 239.3, 149
.5, 159.0, 198.6, 249.6, 195.6, 272.8, 244.0, 179.6, 189.2, 80.6, 187.1, 118.5, 292.8, 267.0, 214.7, 236.7, 168.3, 23
0.2, 122.8, 180.8, 141.4, 164.9, 256.4, 215.2, 188.4, 169.2, 213.4, 240.1, 275.4, 165.2, 91.7, 147.4, 128.3, 172.8, 2
07.2, 245.9, 154.8, 142.6, 129.8, 167.2, 218.5, 194.4, 189.3, 238.8, 157.0, 148.2, 228.9, 239.5, 56.0, 208.4, 251.8,
165.9, 130.0, 213.6, 257.9, 220.8, 265.3, 172.7, 219.6, 241.1, 249.7, 168.7, 235.8, 157.8, 238.3, 213.1, 202.3, 213.2
, 140.2, 240.2, 226.2, 183.9, 48.1, 168.8, 215.7, 255.1, 212.7, 254.2, 231.4, 189.9, 214.0, 186.6, 129.3, 184.5, 201.
0, 185.0, 247.8, 118.6, 240.7, 119.3, 134.5, 164.1, 255.3, 260.5, 292.0, 217.6, 125.8, 336.0, 277.9, 269.5, 262.6, 21
4.1, 124.2, 233.7, 199.8, 136.8, 188.0, 233.0, 267.6, 262.0, 234.9, 220.7, 328.7, 207.8, 175.1, 153.1, 249.1, 184.4,
205.0, 161.3, 164.3, 176.0, 165.1, 78.9, 274.8, 174.9, 221.0, 138.9, 227.8, 184.2, 185.9, 231.1, 147.2, 228.8, 125.6,
60.0, 250.5, 201.4, 90.2, 159.6, 191.9, 209.9, 230.9, 201.3, 222.7, 232.4, 67.0, 250.7, 224.0, 262.3, 155.7, 253.5, 2
41.9, 71.0, 272.3, 230.7, 123.1, 260.3, 289.2, 162.0, 156.0, 196.3, 115.5, 247.9, 224.4, 88.1, 232.6, 212.1, 296.8, 1
83.3, 171.9, 263.5, 171.4, 289.5, 196.6, 273.7, 128.9, 243.9, 261.7, 234.7, 243.1, 146.2, 171.5, 285.2, 186.8, 117.0,
332.1, 235.6, 121.0, 156.7, 264.3, 121.6, 206.8, 301.5, 263.6, 182.0, 82.2, 298.0, 232.1, 193.6, 132.8, 152.1, 163.1,
182.9, 296.5, 303.3, 151.4, 186.9, 147.7, 202.5, 277.5, 107.9, 232.7, 227.0, 168.1, 274.6, 175.9, 180.7, 305.8, 221.8
, 207.9, 200.1, 228.7, 244.3, 179.5, 133.0, 235.4, 167.1, 226.1, 185.8, 92.3, 101.5, 206.2, 278.2, 191.7, 136.9, 139.
6, 247.2, 236.3, 177.1, 210.8, 129.2, 112.7, 195.8, 117.6, 164.2, 196.7, 151.2, 116.6, 322.3, 120.3, 295.7, 197.7, 15
3.7, 173.1, 280.4, 198.2, 134.9, 350.9, 267.3, 210.4, 293.9, 232.8, 173.2, 168.5, 294.0, 198.4, 201.6, 193.2, 161.0,
322.2, 139.1, 214.3, 105.8, 236.8, 215.5, 108.2, 138.6, 231.7, 182.7, 159.7, 222.3, 241.2, 308.7, 270.6, 280.8, 208.3
, 186.3, 272.7, 159.4, 145.1, 211.8, 155.3, 249.0, 169.4, 160.2, 115.0, 272.5, 240.4, 206.6, 119.6, 258.6, 261.6, 242
.8, 208.7, 276.3, 111.3, 170.6, 303.4, 260.2, 270.7, 298.6, 207.1, 245.8, 301.0, 134.2, 211.0, 258.1, 168.4, 258.9, 1
24.4, 123.3, 261.3, 155.9, 273.2, 139.8, 88.7, 250.0, 157.1, 159.2, 259.3, 239.1, 140.0, 222.5, 146.8, 227.1, 73.2, 2
11.6, 135.8, 247.3, 244.2, 126.9, 241.0, 223.8, 163.6, 216.4, 191.4, 245.1, 240.9, 259.9, 204.3, 275.5, 178.5, 252.8,
303.2, 77.9, 75.9, 106.2, 210.3, 159.3, 253.1, 301.7, 286.0, 271.7, 149.6, 252.7, 196.2, 149.1, 236.4, 226.6, 172.4,
231.9, 175.0, 107.1, 282.8, 141.1, 254.5, 137.0, 165.6, 210.2, 189.5, 88.6, 256.0, 205.3, 152.2, 65.2, 237.3, 153.3,
217.4, 139.5, 113.2, 198.7, 152.9, 90.5, 187.9, 256.5, 167.0, 113.3, 126.0, 200.5, 175.6, 268.8, 176.5, 225.3, 278.5,
120.0, 49.2, 199.4, 188.3, 246.2, 184.7, 184.1, 212.9, 310.6, 161.5, 196.1, 255.6, 228.3, 136.4, 185.7, 266.3, 299.8,
136.0, 123.5, 148.1, 246.8, 99.5, 151.7, 280.1, 278.3, 279.0, 289.6, 180.4, 263.4, 167.5, 277.0, 178.8, 242.4, 222.2,
127.7, 237.4, 250.8, 314.4, 114.7, 295.3, 255.7, 300.9, 94.4, 153.2, 265.8, 318.7, 238.2, 156.9, 274.7, 253.9, 185.1,
212.2, 127.0, 126.4, 276.2, 223.4, 106.5, 178.7, 224.8, 122.2, 170.0, 261.9, 304.6, 143.5, 139.2, 179.8, 123.6, 339.9
```

```
, 298.5, 266.9, 252.5, 243.5, 251.0, 89.3, 148.7, 263.2, 284.5, 266.2, 327.1, 319.0, 252.0, 292.4, 181.8, 174.3, 197.
8, 294.3, 119.7, 138.0, 144.5, 179.0, 209.0, 134.3, 192.6, 120.5, 144.1, 171.0, 177.6, 69.2, 181.4, 167.4, 233.5, 329
.3, 203.7, 253.2, 173.6, 231.2, 262.1, 252.3, 313.7, 155.1, 292.7, 191.3, 115.9, 238.0, 236.1, 276.8, 150.7, 173.8, 2
33.8, 66.0, 263.0, 87.6, 238.1, 361.8, 312.8, 335.7, 260.7, 153.6, 281.3, 137.9, 149.9, 171.6, 112.9, 289.7, 95.6, 23
8.6, 160.3, 172.6, 251.7, 284.7, 269.1, 108.5, 143.0, 293.6, 287.9, 276.1, 147.3, 166.2, 236.2, 242.7, 315.3, 229.0,
184.8, 111.6, 149.3, 91.2, 145.8, 140.4, 244.9, 285.6, 268.3, 150.3, 156.5, 293.8, 153.0, 286.7, 137.2, 141.9, 155.8,
241.8, 200.0, 212.0, 160.8, 250.4, 145.4, 156.4, 122.3, 312.5, 269.7, 268.1, 223.6, 319.3, 192.3, 354.2, 212.3, 264.5
, 95.1, 187.7, 303.7, 231.6, 304.4, 194.7, 281.2, 138.3, 279.5, 174.4, 273.8, 314.9, 270.9, 142.4, 141.0, 176.4, 129.
5, 171.2, 236.5, 295.9, 283.2, 312.6, 193.5, 147.8, 222.9, 255.8, 215.4, 238.7, 258.7, 216.0, 257.7, 185.4, 151.0, 25
7.1, 150.8, 138.1, 166.0, 274.9, 317.0, 269.4, 222.4, 324.7, 274.3, 230.6, 96.6, 143.9, 237.9, 198.1, 234.2, 124.7, 2
55.5, 178.0, 89.1, 127.4, 142.7, 285.1, 223.9, 363.7, 254.0, 266.6, 195.4, 162.4, 181.7, 178.3, 262.4, 283.3, 164.0,
265.0, 313.4, 324.8, 133.1, 225.7, 243.7, 246.9, 127.3, 103.3, 131.0, 132.2, 204.0, 290.0, 103.8, 254.7, 186.5, 170.2
, 291.7, 215.3, 224.3, 146.4, 143.3, 214.6, 225.6, 162.8, 126.2, 188.6, 137.5, 67.5, 305.5, 229.6, 256.3, 259.8, 120.
6, 130.4, 226.4, 251.5, 102.4, 277.4, 264.6, 132.9, 248.4, 192.7, 135.9, 99.1, 142.1, 144.2, 0.0, 306.6, 260.4, 90.0,
259.6, 246.4, 97.7, 202.1, 131.7, 148.8, 275.6, 224.5, 302.6, 191.6, 288.7, 269.9, 150.9, 114.8, 199.6, 80.0, 285.8,
170.8, 209.7, 141.5, 154.7, 208.1, 237.2, 341.3, 134.7, 314.3, 237.1, 191.8, 283.4, 228.0, 198.3, 192.9, 160.4, 197.9
, 109.9, 156.1, 320.9, 114.3, 179.4, 122.9, 156.2, 248.0, 287.6, 225.4, 299.1, 244.8, 140.7, 103.6, 274.4, 206.3, 148
.0, 86.8, 294.6, 275.9, 276.0, 121.8, 332.8, 182.6, 74.6, 122.1, 158.9, 279.6, 161.1, 126.5, 135.0, 286.1, 87.8, 149.
2, 92.0, 144.4, 114.5, 300.5, 85.0, 116.9, 284.8, 153.4, 288.8, 265.9]

 Unique values for total eve calls
 N-unique values for total eve calls is 123
[99, 103, 110, 88, 122, 101, 108, 94, 80, 111, 83, 148, 71, 75, 76, 97, 90, 65, 93, 121, 102, 72, 112, 100, 84, 109,
63, 107, 115, 119, 116, 92, 85, 98, 118, 74, 117, 58, 96, 66, 67, 62, 77, 164, 126, 142, 64, 104, 79, 95, 86, 105, 81
, 113, 106, 59, 48, 82, 87, 123, 114, 140, 128, 60, 78, 125, 91, 46, 138, 129, 89, 133, 136, 57, 135, 139, 51, 70, 15
1, 137, 134, 73, 152, 168, 68, 120, 69, 127, 132, 143, 61, 124, 42, 54, 131, 52, 149, 56, 37, 130, 49, 146, 147, 55,
12, 50, 157, 155, 45, 144, 36, 156, 53, 141, 44, 153, 154, 150, 43, 0, 145, 159, 170]

 Unique values for total eve charge
 N-unique values for total eve charge is 1440
[16.78, 16.62, 10.3, 5.26, 12.61, 18.75, 29.62, 8.76, 29.89, 18.87, 19.42, 13.89, 8.92, 21.05, 26.11, 27.01, 23.88, 1
8.55, 18.09, 13.56, 20.37, 14.44, 6.2, 11.67, 20.84, 23.55, 16.24, 13.22, 21.95, 18.28, 11.62, 17.13, 2.65, 21.45, 16
.58, 18.47, 13.81, 19.01, 15.95, 23.1, 14.18, 17.33, 23.99, 14.05, 19.19, 18.11, 13.82, 11.44, 19.66, 18.46, 22.93, 1
7.94, 16.17, 22.74, 18.67, 21.19, 15.3, 6.4, 20.95, 15.08, 15.15, 20.92, 15.96, 13.85, 14.41, 17.54, 18.44, 14.37, 14
.49, 16.0, 12.66, 19.27, 13.36, 18.98, 15.39, 6.55, 13.97, 13.19, 25.8, 17.41, 11.57, 22.07, 21.18, 19.2, 13.18, 17.7
2, 10.49, 16.57, 16.23, 14.71, 15.16, 16.2, 6.89, 18.13, 17.62, 17.8, 17.48, 21.44, 16.07, 10.12, 15.61, 14.76, 15.91
, 17.19, 13.98, 11.14, 12.57, 26.96, 17.51, 14.42, 21.67, 12.95, 18.69, 13.39, 18.26, 19.32, 12.05, 15.6, 11.25, 9.37
, 19.5, 12.46, 16.46, 13.74, 18.5, 13.45, 19.58, 17.1, 17.22, 14.73, 18.49, 17.86, 10.78, 12.92, 23.49, 18.73, 15.09,
13.61, 17.3, 18.39, 18.56, 13.78, 18.82, 17.57, 13.4, 21.12, 12.41, 24.83, 19.33, 21.0, 21.82, 15.59, 14.64, 20.53, 2
0.52, 11.51, 12.63, 18.17, 13.88, 20.67, 16.43, 15.93, 19.0, 17.98, 15.21, 12.7, 16.18, 16.5, 24.85, 18.23, 11.79, 20
.2, 21.62, 20.83, 22.82, 5.47, 13.87, 15.34, 7.71, 17.27, 14.16, 15.05, 15.49, 14.99, 16.97, 18.74, 27.9, 15.64, 15.1
8, 21.89, 17.83, 7.13, 15.87, 12.91, 20.97, 13.23, 20.78, 9.61, 19.39, 15.84, 19.06, 22.7, 9.36, 12.97, 14.83, 23.2,
```

```
20.59, 14.3, 19.93, 20.8, 16.12, 26.62, 11.0, 24.76, 18.45, 20.43, 17.96, 10.1, 17.07, 10.28, 14.33, 7.51, 11.4, 15.5
, 15.04, 22.76, 14.15, 8.69, 12.72, 17.2, 23.63, 10.02, 14.62, 19.8, 19.55, 23.21, 18.4, 14.65, 21.24, 15.35, 20.0, 1
7.79, 12.16, 18.8, 16.54, 22.1, 16.41, 11.58, 14.91, 19.12, 19.99, 19.92, 16.56, 19.7, 17.68, 18.62, 14.79, 17.93, 13
.59, 24.51, 15.43, 14.93, 10.88, 22.18, 18.65, 10.97, 16.49, 10.21, 11.34, 15.29, 15.67, 18.59, 16.99, 9.38, 22.51, 2
9.79, 24.86, 21.56, 21.21, 21.96, 18.7, 16.65, 23.83, 17.46, 26.03, 22.98, 21.83, 18.01, 16.05, 22.03, 15.11, 21.84,
20.96, 13.17, 18.66, 17.78, 20.02, 20.45, 26.6, 21.14, 16.75, 22.45, 12.99, 11.77, 23.08, 15.01, 22.65, 16.93, 21.75,
14.97, 7.09, 15.23, 10.46, 13.8, 8.98, 17.4, 15.06, 17.43, 18.58, 6.74, 22.5, 26.54, 15.27, 19.75, 8.77, 18.16, 21.54
, 19.74, 19.13, 18.94, 9.72, 19.54, 17.91, 10.05, 24.33, 13.66, 13.21, 12.33, 27.43, 23.29, 17.38, 22.97, 20.27, 20.7
2, 14.98, 17.44, 7.94, 16.92, 23.74, 11.11, 18.61, 9.42, 16.34, 20.57, 13.68, 9.32, 15.72, 21.36, 12.0, 15.83, 20.6,
16.96, 10.54, 24.05, 13.6, 14.86, 27.8, 22.47, 24.06, 11.93, 11.07, 15.77, 9.64, 16.73, 23.23, 22.15, 24.02, 15.48, 1
4.9, 17.32, 10.11, 25.61, 15.02, 28.1, 16.8, 13.09, 22.58, 16.66, 21.86, 20.06, 11.42, 17.09, 17.24, 23.05, 20.94, 20
.85, 23.28, 20.86, 22.44, 18.71, 10.23, 19.41, 9.19, 16.6, 18.72, 14.26, 15.44, 17.02, 14.17, 13.99, 11.59, 26.81, 19
.98, 12.45, 13.72, 13.44, 21.57, 21.77, 19.68, 11.2, 18.84, 24.87, 19.59, 23.69, 9.74, 15.33, 24.43, 20.77, 17.63, 12
.37, 10.7, 20.11, 28.03, 17.25, 18.34, 16.47, 13.48, 19.1, 13.07, 13.13, 19.48, 12.86, 14.59, 15.51, 13.37, 28.65, 17
.26, 21.51, 3.59, 5.65, 23.89, 12.38, 15.56, 16.22, 18.41, 14.28, 13.43, 20.66, 21.16, 17.06, 21.93, 22.02, 10.19, 25
.82, 21.34, 20.15, 26.35, 22.46, 8.36, 21.88, 23.07, 13.65, 22.52, 16.74, 15.07, 23.38, 23.5, 17.03, 19.28, 19.52, 28
.48, 29.52, 15.57, 24.91, 14.0, 5.01, 22.11, 25.49, 17.65, 21.6, 13.76, 8.72, 14.27, 17.08, 20.91, 16.79, 14.09, 22.5
7, 19.14, 18.06, 24.59, 10.09, 21.13, 22.23, 12.8, 13.11, 19.84, 18.86, 23.33, 24.73, 13.14, 16.02, 16.48, 12.22, 12.
49, 12.44, 15.75, 14.53, 24.64, 7.62, 19.09, 16.77, 10.84, 12.55, 11.39, 14.75, 16.87, 17.89, 22.53, 18.64, 15.12, 19
.37, 10.85, 8.61, 17.9, 17.42, 10.86, 8.79, 13.75, 8.74, 11.17, 25.93, 11.06, 12.77, 16.04, 16.06, 18.83, 12.27, 21.1
5, 9.9, 15.4, 16.13, 13.46, 12.79, 20.54, 19.83, 15.9, 18.22, 17.76, 16.39, 22.83, 8.97, 23.26, 15.81, 13.52, 13.93,
16.1, 19.64, 13.12, 12.96, 18.42, 25.31, 6.66, 17.99, 20.61, 16.59, 18.63, 16.53, 13.91, 14.39, 16.44, 14.51, 16.15,
18.21, 14.94, 11.32, 14.43, 20.47, 17.73, 23.68, 13.9, 21.28, 11.7, 10.36, 20.58, 20.38, 20.68, 23.02, 19.31, 22.73,
22.19, 17.7, 10.03, 18.96, 21.27, 14.19, 17.6, 16.9, 16.76, 20.65, 15.62, 12.07, 14.48, 12.21, 22.41, 17.75, 10.01, 1
8.97, 16.83, 24.34, 18.6, 22.89, 22.05, 11.71, 18.78, 27.1, 13.29, 14.63, 20.62, 20.4, 9.08, 17.29, 17.64, 17.23, 6.4
9, 3.73, 10.53, 11.26, 18.52, 24.45, 14.74, 19.56, 7.96, 18.43, 17.39, 18.33, 9.83, 19.17, 25.92, 18.88, 22.99, 12.75
, 13.83, 16.32, 16.69, 16.35, 4.5, 17.97, 23.25, 20.05, 15.32, 10.26, 14.06, 14.89, 16.7, 12.47, 12.98, 14.56, 22.8,
20.51, 17.81, 21.39, 14.84, 11.49, 20.88, 27.47, 17.36, 15.78, 24.68, 12.19, 3.61, 19.86, 13.47, 5.17, 17.85, 17.05,
17.82, 21.23, 11.75, 6.03, 14.14, 26.89, 24.63, 24.48, 12.04, 23.94, 10.94, 18.68, 12.1, 9.56, 17.5, 6.87, 9.02, 12.3
4, 19.43, 16.63, 26.28, 19.88, 15.24, 24.42, 17.59, 16.21, 18.92, 19.89, 13.64, 24.3, 15.92, 27.24, 12.76, 21.09, 22.
0, 21.1, 22.29, 21.35, 13.86, 23.04, 16.33, 11.15, 22.64, 12.73, 26.04, 12.35, 22.38, 9.79, 15.94, 19.9, 17.15, 18.37
, 19.76, 14.01, 14.25, 14.22, 26.99, 17.31, 21.78, 24.6, 6.96, 17.47, 20.75, 12.62, 22.34, 24.17, 24.75, 21.2, 18.35,
14.6, 11.98, 18.18, 14.03, 9.69, 17.95, 12.5, 13.5, 14.08, 15.22, 21.81, 4.98, 8.3, 11.38, 16.91, 7.63, 12.4, 19.05,
19.82, 18.54, 17.77, 20.44, 12.88, 21.04, 17.55, 9.55, 18.81, 18.38, 17.35, 18.79, 15.69, 20.34, 12.71, 16.88, 21.22,
23.19, 20.74, 16.08, 6.85, 10.07, 24.89, 18.25, 20.12, 14.31, 19.57, 10.44, 15.37, 12.02, 14.02, 21.79, 18.29, 16.01,
14.38, 18.14, 20.41, 23.41, 14.04, 7.79, 12.53, 10.91, 14.69, 17.61, 20.9, 13.16, 12.12, 11.03, 14.21, 18.57, 16.52,
16.09, 20.3, 13.35, 12.6, 19.46, 20.36, 4.76, 17.71, 21.4, 14.1, 11.05, 21.92, 18.77, 22.55, 14.68, 20.49, 14.34, 20.
04, 13.41, 20.26, 18.12, 11.92, 20.42, 19.23, 15.63, 4.09, 14.35, 21.68, 18.08, 21.61, 19.67, 16.14, 18.19, 15.86, 10
.99, 15.68, 15.73, 21.06, 10.08, 20.46, 10.14, 11.43, 13.95, 21.7, 22.14, 24.82, 10.69, 28.56, 23.62, 22.91, 22.32, 1
8.2, 10.56, 16.98, 11.63, 15.98, 19.81, 22.75, 22.27, 19.97, 18.76, 27.94, 17.66, 14.88, 13.01, 21.17, 13.71, 14.96,
6.71, 23.36, 14.87, 11.81, 19.36, 15.66, 15.8, 12.51, 19.45, 10.68, 5.1, 21.29, 17.12, 7.67, 13.57, 16.31, 17.84, 19.
63, 17.11, 18.93, 5.7, 21.31, 19.04, 22.3, 21.55, 20.56, 6.04, 23.15, 19.61, 22.13, 24.58, 13.77, 13.26, 9.82, 21.07,
```

```
19.07, 7.49, 19.77, 18.03, 25.23, 15.58, 14.61, 22.4, 14.57, 24.61, 16.71, 10.96, 20.73, 22.24, 19.95, 12.43, 14.58,
24.24, 15.88, 9.95, 28.23, 20.03, 10.29, 13.32, 10.34, 17.58, 25.63, 15.47, 6.99, 25.33, 19.73, 11.29, 12.93, 15.55,
25.2, 25.78, 12.87, 15.89, 17.21, 23.59, 9.17, 19.78, 19.3, 14.29, 23.34, 14.95, 15.36, 25.99, 18.85, 17.67, 17.01, 1
9.44, 15.26, 11.31, 20.01, 14.2, 19.22, 15.79, 7.85, 8.63, 17.53, 23.65, 16.29, 11.64, 11.87, 21.01, 20.09, 17.92, 10
.98, 9.58, 16.64, 10.0, 13.96, 16.72, 12.85, 9.91, 27.4, 25.13, 13.06, 16.85, 11.47, 29.83, 22.72, 17.88, 24.98, 19.7
9, 14.72, 14.32, 24.99, 16.86, 17.14, 16.42, 13.69, 27.39, 11.82, 8.99, 20.13, 18.32, 9.2, 11.78, 19.69, 15.53, 18.9,
20.5, 26.24, 23.0, 23.87, 23.18, 13.55, 18.0, 13.2, 14.4, 13.62, 9.78, 23.16, 17.56, 10.17, 21.98, 20.64, 17.74, 9.46
, 14.5, 25.79, 22.12, 23.01, 25.38, 20.89, 25.59, 11.41, 21.94, 22.01, 10.57, 10.48, 22.21, 13.25, 23.22, 11.88, 7.54
, 21.25, 13.53, 22.04, 20.32, 11.9, 18.91, 12.48, 6.22, 11.54, 21.02, 20.76, 10.79, 19.02, 16.27, 20.48, 22.09, 17.37
, 23.42, 15.17, 21.49, 25.77, 6.62, 6.45, 9.03, 13.54, 25.64, 24.31, 23.09, 21.48, 16.68, 12.67, 19.26, 19.71, 9.1, 2
4.04, 11.99, 21.63, 11.65, 17.87, 16.11, 7.53, 21.76, 17.45, 12.94, 5.54, 20.17, 13.03, 18.48, 11.86, 9.62, 16.89, 13
.0, 7.69, 15.97, 21.8, 9.63, 10.71, 17.04, 22.85, 15.0, 19.15, 23.67, 10.2, 4.18, 16.95, 20.93, 15.7, 15.65, 18.1, 26
.4, 13.73, 16.67, 21.73, 25.48, 11.56, 10.5, 12.59, 20.98, 8.46, 12.89, 23.81, 23.66, 23.72, 24.62, 22.39, 14.24, 15.
2, 18.89, 20.18, 21.32, 26.72, 9.75, 25.1, 25.58, 8.02, 13.02, 22.59, 27.09, 20.25, 13.34, 23.35, 21.58, 18.04, 10.8,
10.74, 23.48, 18.99, 9.05, 15.19, 19.11, 10.39, 14.45, 22.26, 25.89, 12.2, 11.83, 15.28, 10.51, 28.89, 25.37, 22.69,
21.46, 20.7, 7.59, 12.64, 22.37, 24.18, 22.63, 27.12, 21.42, 15.45, 14.82, 16.81, 25.02, 11.73, 12.28, 16.37, 10.24,
12.25, 14.54, 15.1, 5.88, 15.42, 14.23, 19.85, 27.99, 21.52, 19.65, 22.28, 26.66, 24.88, 16.26, 9.85, 20.23, 20.07, 2
3.53, 12.81, 14.77, 19.87, 5.61, 22.36, 7.45, 20.24, 30.75, 26.59, 28.53, 22.16, 23.91, 11.72, 12.74, 9.6, 8.13, 20.2
8, 13.63, 14.67, 24.2, 22.87, 9.22, 24.96, 24.47, 23.47, 12.52, 14.13, 20.08, 20.63, 26.8, 19.47, 15.71, 9.49, 12.69,
7.75, 12.39, 20.82, 24.28, 22.81, 12.78, 13.3, 24.97, 24.37, 11.66, 12.06, 13.24, 20.55, 17.0, 18.02, 13.67, 12.36, 1
0.4, 26.56, 22.92, 22.79, 27.14, 30.11, 18.05, 22.48, 8.08, 25.81, 25.87, 16.55, 23.9, 11.76, 23.76, 23.27, 26.77, 23
.03, 11.01, 14.55, 20.1, 25.15, 24.07, 26.57, 16.45, 12.56, 18.95, 21.74, 18.31, 20.29, 21.99, 18.36, 21.9, 15.76, 12
.84, 21.85, 12.82, 11.74, 14.11, 23.37, 26.95, 22.9, 27.6, 23.32, 19.6, 8.21, 12.23, 20.22, 16.84, 19.91, 10.6, 21.72
, 15.13, 7.57, 10.83, 12.13, 24.23, 19.03, 30.91, 21.59, 22.66, 16.61, 24.08, 13.94, 26.64, 27.61, 19.18, 20.71, 20.9
9, 10.82, 8.78, 11.24, 17.34, 24.65, 8.82, 21.65, 15.85, 14.47, 24.79, 18.3, 12.18, 18.24, 13.84, 10.73, 16.03, 11.69
, 5.74, 25.97, 22.08, 10.25, 11.08, 19.24, 21.38, 8.7, 23.58, 22.49, 11.3, 21.11, 16.38, 11.55, 8.42, 12.08, 12.26, 0
.0, 26.06, 7.65, 17.18, 11.19, 12.65, 23.43, 19.08, 25.72, 24.54, 22.94, 12.83, 9.76, 6.8, 24.29, 14.52, 12.03, 13.15
, 17.69, 20.16, 29.01, 11.45, 16.3, 24.09, 19.38, 16.4, 16.82, 9.34, 13.27, 27.28, 15.25, 10.45, 13.28, 21.08, 19.16,
25.42, 20.81, 11.96, 8.81, 12.58, 7.38, 25.04, 23.45, 23.46, 10.35, 28.29, 15.52, 6.34, 10.38, 13.51, 23.77, 10.75, 1
1.48, 24.32, 7.46, 12.68, 7.82, 9.73, 25.54, 7.23, 9.94, 24.21, 13.04, 24.55, 22.6]

 Unique values for total night minutes
 N-unique values for total night minutes is 1591
[244.7, 254.4, 162.6, 196.9, 186.9, 203.9, 212.6, 211.8, 215.8, 326.4, 208.8, 196.0, 141.1, 192.3, 203.0, 160.6, 89.3
, 129.6, 165.7, 192.8, 209.6, 181.8, 189.6, 237.0, 250.7, 182.7, 102.1, 181.5, 178.7, 250.5, 246.2, 293.3, 280.2, 213
.5, 152.8, 129.3, 227.8, 101.7, 188.3, 187.8, 122.2, 311.5, 178.5, 265.3, 163.1, 134.7, 242.2, 143.2, 70.6, 236.8, 24
9.0, 282.8, 228.5, 270.2, 140.8, 181.2, 129.8, 189.3, 166.6, 166.3, 138.0, 265.5, 159.0, 214.1, 157.8, 153.5, 148.6,
295.3, 254.6, 172.5, 152.4, 188.2, 181.4, 270.1, 173.0, 177.5, 228.6, 224.0, 278.5, 175.7, 222.7, 191.4, 323.0, 182.4
, 202.1, 208.9, 109.6, 253.2, 263.9, 127.7, 163.2, 174.1, 190.9, 167.2, 275.2, 160.2, 129.1, 180.0, 245.3, 248.6, 190
.0, 187.2, 217.0, 219.4, 241.4, 119.2, 222.8, 227.7, 247.8, 211.4, 138.3, 57.5, 170.0, 177.6, 143.3, 200.1, 142.2, 22
0.8, 112.9, 227.4, 252.5, 154.8, 225.7, 175.0, 264.7, 146.9, 256.7, 261.4, 206.1, 206.4, 247.2, 237.5, 195.6, 263.3,
158.6, 193.6, 253.8, 109.7, 200.5, 249.4, 110.4, 203.4, 121.1, 161.6, 286.9, 172.3, 299.0, 227.3, 140.5, 269.5, 265.9
```

```
, 153.9, 259.2, 178.6, 164.8, 137.5, 253.5, 229.5, 236.6, 228.7, 264.8, 261.3, 105.9, 154.0, 97.4, 164.7, 268.9, 170.
9, 195.2, 208.0, 201.2, 282.2, 136.8, 169.9, 214.0, 134.4, 241.2, 198.5, 77.3, 187.1, 231.2, 112.2, 238.0, 208.2, 150
.0, 119.1, 180.5, 261.5, 181.7, 255.3, 245.7, 249.9, 245.0, 240.5, 198.1, 190.4, 179.8, 223.3, 260.1, 226.1, 194.3, 1
22.4, 246.9, 73.2, 225.2, 265.4, 151.0, 188.7, 212.2, 244.9, 220.2, 174.3, 236.0, 250.1, 221.5, 76.5, 136.9, 163.3, 2
17.6, 197.6, 180.9, 154.3, 233.2, 234.9, 192.2, 226.6, 139.8, 195.3, 223.1, 275.8, 354.9, 202.3, 261.8, 283.4, 245.9,
228.4, 279.2, 191.8, 172.4, 236.9, 178.3, 173.1, 231.6, 193.4, 221.7, 169.4, 223.9, 185.2, 241.0, 146.5, 291.6, 232.4
, 147.4, 184.8, 200.9, 206.2, 203.2, 239.2, 122.5, 203.3, 214.2, 254.2, 193.3, 144.1, 240.3, 281.4, 252.1, 194.5, 289
.9, 255.2, 312.1, 299.3, 125.1, 146.7, 216.1, 259.5, 216.8, 142.4, 240.4, 207.1, 287.7, 195.4, 207.2, 297.0, 241.1, 2
13.8, 133.9, 183.4, 183.5, 265.7, 220.1, 205.0, 123.9, 160.5, 147.6, 273.0, 154.9, 287.4, 251.6, 245.1, 152.3, 197.4,
156.3, 188.4, 79.7, 130.2, 138.4, 206.3, 169.1, 170.2, 302.8, 212.7, 175.5, 262.6, 275.0, 244.8, 165.9, 135.0, 186.7,
127.6, 243.1, 229.9, 237.3, 96.4, 204.0, 194.1, 213.7, 206.0, 114.3, 178.4, 183.0, 253.0, 222.1, 309.6, 192.1, 253.9,
128.6, 255.0, 164.9, 204.4, 225.3, 269.2, 167.3, 276.9, 134.5, 187.9, 198.9, 233.1, 218.6, 240.0, 249.5, 225.6, 204.7
, 321.3, 127.8, 148.2, 285.1, 214.7, 213.1, 232.8, 185.7, 166.2, 107.6, 204.1, 234.2, 186.5, 191.7, 226.7, 240.1, 165
.1, 201.4, 198.6, 247.4, 197.2, 167.0, 189.0, 168.8, 238.4, 212.4, 209.5, 239.3, 212.5, 171.8, 77.2, 197.3, 263.6, 20
0.0, 205.2, 180.2, 217.4, 209.3, 214.4, 195.0, 181.0, 155.6, 164.2, 214.6, 219.5, 189.4, 245.8, 145.7, 131.6, 154.5,
349.2, 208.3, 179.1, 192.9, 107.9, 173.4, 202.2, 260.0, 190.7, 223.6, 115.7, 180.3, 153.7, 136.6, 299.7, 208.4, 280.5
, 272.4, 182.1, 258.8, 258.3, 240.7, 176.0, 162.8, 289.2, 225.1, 220.3, 294.7, 271.5, 112.3, 255.4, 257.4, 223.5, 132
.7, 244.3, 186.3, 203.7, 244.2, 263.4, 250.6, 179.6, 126.8, 175.9, 75.8, 251.9, 280.7, 261.9, 288.0, 169.7, 205.1, 14
6.2, 240.8, 227.2, 108.1, 144.9, 182.5, 123.4, 169.5, 113.5, 130.9, 239.6, 190.5, 152.9, 67.7, 264.2, 199.3, 232.0, 2
33.4, 207.7, 125.7, 246.5, 218.5, 196.8, 121.0, 224.7, 217.5, 141.9, 265.2, 191.6, 76.4, 268.0, 171.0, 133.7, 196.7,
158.8, 116.6, 192.4, 108.0, 149.5, 226.9, 257.6, 308.2, 172.7, 230.8, 231.5, 123.0, 248.7, 147.1, 143.9, 168.9, 296.3
, 138.7, 167.1, 279.8, 140.0, 246.0, 150.8, 311.6, 183.9, 200.7, 179.3, 170.1, 122.6, 183.1, 169.3, 269.7, 235.3, 167
.6, 246.8, 170.5, 121.6, 265.0, 129.4, 195.7, 189.1, 298.9, 194.8, 142.8, 266.9, 268.4, 157.0, 264.6, 249.2, 144.6, 1
52.1, 210.7, 220.0, 306.3, 256.5, 169.0, 237.4, 259.3, 210.6, 208.5, 180.6, 239.8, 215.9, 158.4, 170.3, 104.8, 103.1,
179.7, 199.2, 208.1, 180.1, 289.5, 186.6, 134.9, 225.5, 78.1, 240.6, 262.7, 151.8, 135.9, 206.9, 212.8, 103.9, 211.3,
204.6, 152.2, 118.3, 205.8, 256.1, 202.4, 154.4, 126.9, 234.5, 254.9, 188.8, 169.2, 206.6, 307.1, 187.5, 128.2, 243.6
, 194.4, 260.8, 200.4, 197.8, 259.9, 232.7, 174.5, 151.7, 268.8, 184.0, 242.7, 166.7, 105.4, 206.7, 216.5, 231.7, 221
.4, 221.8, 221.6, 226.3, 211.9, 175.3, 274.7, 189.7, 223.7, 210.3, 203.8, 162.2, 248.1, 203.5, 232.9, 226.5, 133.1, 2
41.7, 128.8, 159.7, 253.7, 101.2, 148.7, 184.6, 177.9, 320.7, 145.8, 184.5, 317.8, 158.9, 145.2, 182.2, 251.4, 234.3,
153.8, 134.0, 288.9, 239.4, 142.6, 94.3, 165.4, 240.2, 167.5, 166.9, 179.4, 247.3, 291.0, 210.8, 136.5, 194.6, 147.7,
146.3, 190.8, 171.7, 211.7, 234.7, 185.1, 149.4, 184.2, 223.0, 268.7, 119.8, 241.3, 186.2, 65.8, 168.7, 160.8, 95.1,
215.5, 196.3, 295.6, 252.7, 207.4, 111.4, 246.1, 72.4, 260.2, 187.3, 215.1, 185.0, 345.8, 217.8, 80.2, 154.6, 258.0,
284.7, 241.5, 307.6, 111.7, 77.9, 289.6, 114.9, 45.0, 196.2, 270.0, 229.8, 179.2, 207.5, 176.7, 264.1, 224.2, 221.0,
157.9, 204.8, 136.2, 245.5, 219.8, 264.9, 208.6, 163.0, 312.5, 266.0, 228.1, 295.8, 342.8, 202.0, 364.3, 218.7, 196.1
, 139.3, 180.7, 214.5, 236.5, 255.6, 277.4, 183.8, 300.7, 230.2, 272.0, 193.0, 233.7, 201.6, 255.7, 173.3, 205.5, 190
.6, 193.8, 150.7, 191.2, 263.2, 128.4, 164.6, 130.0, 219.6, 273.4, 154.1, 128.1, 191.0, 224.1, 268.3, 213.4, 221.3, 1
96.5, 275.4, 178.1, 224.5, 216.2, 63.3, 255.9, 144.7, 181.9, 148.1, 175.8, 54.5, 117.3, 260.6, 238.9, 172.0, 150.2, 1
33.4, 173.9, 168.5, 194.0, 258.2, 304.3, 176.3, 170.6, 216.7, 242.3, 110.3, 122.1, 214.3, 262.8, 159.6, 204.3, 171.2,
161.2, 146.8, 238.7, 94.9, 306.6, 233.3, 243.2, 202.6, 137.6, 202.5, 138.2, 105.6, 172.8, 175.1, 258.4, 167.8, 267.9,
50.1, 155.5, 246.4, 210.0, 219.1, 171.3, 109.9, 241.6, 164.3, 164.4, 123.2, 255.1, 248.2, 251.7, 151.6, 213.6, 182.6,
258.5, 207.9, 304.4, 43.7, 262.9, 150.9, 247.0, 239.9, 242.0, 283.7, 229.2, 182.3, 116.3, 189.8, 216.0, 117.1, 209.2,
254.0, 260.9, 135.3, 162.9, 235.8, 162.1, 94.1, 136.0, 134.6, 168.3, 81.6, 161.1, 281.9, 102.0, 322.2, 132.3, 174.9,
```

```
237.9, 140.1, 132.5, 132.0, 174.0, 271.8, 108.8, 274.0, 153.2, 214.8, 195.1, 254.3, 281.8, 175.4, 285.9, 82.3, 205.7,
174.4, 134.3, 291.8, 132.6, 349.7, 263.7, 104.5, 255.8, 207.8, 192.5, 103.7, 198.0, 170.8, 195.9, 156.7, 120.5, 90.9,
119.0, 127.4, 210.5, 232.1, 178.8, 184.3, 152.7, 82.4, 167.7, 352.5, 166.5, 259.8, 213.3, 143.6, 188.1, 232.2, 239.5,
186.4, 168.2, 210.1, 286.7, 120.2, 245.4, 250.2, 23.2, 197.1, 120.3, 157.7, 144.2, 141.6, 183.3, 271.3, 261.6, 150.4,
281.1, 174.7, 209.7, 95.6, 163.9, 194.7, 154.7, 142.0, 254.8, 111.5, 229.6, 236.3, 153.0, 260.7, 63.6, 111.6, 381.9,
168.6, 192.6, 224.3, 220.9, 193.7, 254.7, 186.1, 134.2, 179.9, 153.4, 242.8, 230.7, 227.1, 163.5, 193.9, 228.2, 191.9
, 243.4, 277.3, 135.7, 160.4, 98.9, 264.5, 333.5, 285.3, 261.7, 135.4, 235.7, 165.6, 107.5, 166.4, 191.3, 197.7, 155.
1, 256.6, 201.9, 163.6, 248.3, 260.4, 167.9, 243.3, 203.1, 150.5, 252.9, 222.3, 98.3, 233.0, 217.9, 161.0, 123.5, 133
.6, 224.9, 188.9, 201.1, 139.4, 275.6, 377.5, 184.1, 167.4, 126.3, 252.4, 221.1, 258.6, 185.8, 83.9, 228.0, 216.3, 17
3.8, 158.7, 165.2, 206.5, 249.6, 218.8, 305.4, 190.1, 282.5, 193.5, 244.0, 222.5, 211.5, 210.2, 162.5, 185.5, 236.7,
252.2, 211.1, 65.7, 311.8, 233.8, 194.2, 203.6, 71.1, 171.5, 252.0, 293.7, 237.7, 219.9, 199.7, 235.5, 104.1, 289.4,
217.2, 151.5, 288.8, 198.4, 279.6, 274.4, 230.1, 185.9, 172.2, 166.8, 271.2, 253.4, 309.1, 227.0, 217.1, 239.1, 187.7
, 178.9, 79.3, 150.3, 114.2, 325.6, 285.4, 200.6, 192.0, 280.4, 272.8, 161.9, 169.8, 290.0, 114.1, 238.2, 188.0, 285.
7, 151.9, 241.8, 311.1, 158.2, 151.2, 270.4, 104.7, 139.6, 177.7, 155.7, 165.8, 281.3, 131.3, 210.4, 115.6, 235.4, 20
9.9, 266.6, 161.5, 267.1, 226.0, 268.5, 173.2, 286.3, 161.8, 192.7, 178.2, 216.4, 178.0, 120.0, 129.0, 267.6, 116.4,
269.8, 228.9, 231.4, 297.9, 282.6, 201.8, 166.0, 222.4, 216.9, 157.4, 300.0, 118.9, 276.6, 218.0, 262.0, 141.5, 141.2
, 117.8, 165.3, 186.0, 127.9, 171.6, 229.4, 133.3, 229.0, 114.5, 281.5, 236.4, 218.9, 116.1, 235.6, 287.8, 169.6, 179
.5, 123.8, 87.5, 221.2, 98.0, 263.8, 185.6, 294.8, 227.5, 94.4, 112.8, 181.6, 286.5, 243.9, 108.9, 127.1, 277.8, 115.
9, 199.4, 250.9, 72.2, 256.2, 218.3, 247.1, 224.6, 231.3, 243.5, 269.0, 161.3, 129.2, 212.3, 144.0, 91.2, 230.4, 110.
7, 149.8, 278.2, 323.5, 185.4, 236.1, 255.5, 198.8, 84.8, 85.8, 310.5, 273.2, 256.3, 257.2, 211.0, 193.2, 144.4, 211.
6, 309.2, 201.7, 187.4, 134.1, 301.7, 242.9, 266.7, 225.9, 318.3, 305.5, 247.5, 315.0, 229.1, 202.8, 188.6, 99.0, 250
.3, 218.2, 107.3, 146.4, 230.6, 176.1, 193.1, 159.8, 156.2, 130.3, 142.7, 172.1, 272.9, 136.7, 171.4, 215.4, 164.0, 2
02.7, 314.1, 159.1, 156.6, 138.6, 98.2, 185.3, 189.9, 245.2, 188.5, 95.0, 160.7, 177.4, 172.9, 189.5, 227.6, 303.5, 1
54.2, 328.5, 212.9, 257.5, 269.9, 151.1, 181.1, 101.8, 248.9, 220.6, 244.1, 244.4, 219.0, 142.1, 117.6, 220.4, 253.1,
149.9, 95.3, 162.4, 246.7, 153.6, 233.5, 195.5, 199.1, 277.6, 89.7, 287.6, 215.6, 228.3, 157.6, 149.2, 176.4, 118.0,
184.4, 132.8, 160.0, 329.3, 184.9, 226.4, 231.8, 271.9, 279.5, 257.9, 216.6, 293.5, 163.4, 239.7, 284.6, 273.7, 235.2
, 109.3, 238.5, 254.1, 152.6, 137.7, 99.3, 266.3, 243.0, 237.6, 137.4, 173.6, 142.3, 100.9, 213.2, 152.5, 177.3, 200.
8, 269.1, 119.4, 159.4, 232.6, 128.3, 268.2, 291.2, 94.0, 259.0, 131.4, 223.2, 118.5, 218.4, 313.4, 139.5, 269.6, 126
.6, 117.0, 207.0, 270.6, 199.5, 113.3, 326.0, 264.4, 304.2, 310.1, 103.8, 180.8, 367.7, 248.5, 147.5, 235.0, 98.6, 10
5.2, 56.6, 110.1, 213.9, 140.3, 54.0, 205.3, 238.6, 163.7, 221.9, 298.2, 104.9, 149.7, 129.9, 180.4, 104.0, 275.9, 26
2.2, 184.7, 212.0, 168.4, 321.2, 174.2, 64.2, 165.0, 229.7, 293.9, 253.6, 197.9, 191.1, 176.2, 230.5, 280.0, 259.6, 2
89.3, 285.0, 197.5, 147.0, 292.8, 270.9, 174.6, 208.7, 224.8, 329.2, 238.8, 145.5, 256.4, 137.9, 176.6, 147.8, 158.1,
251.2, 226.2, 272.6, 166.1, 310.7, 128.9, 282.9, 182.9, 344.3, 143.7, 179.0, 297.1, 164.5, 257.0, 232.5, 244.6, 264.0
, 299.6, 302.0, 160.3, 153.3, 294.5, 266.2, 161.4, 235.1, 132.9, 395.0, 204.2, 308.9, 88.2, 256.9, 209.0, 198.7, 219.
7, 250.8, 122.0, 271.7, 259.7, 160.1, 170.7, 145.1, 312.8, 249.1, 302.2, 197.0, 126.7, 233.6, 143.0, 139.1, 257.1, 10
2.4, 155.0, 283.6, 350.2, 149.3, 141.8, 215.7, 79.9, 273.1, 282.3, 264.3, 230.9, 201.3, 284.4, 194.9, 131.2, 286.2, 1
28.5, 177.1, 268.1, 143.1, 111.0, 276.7, 133.5, 187.6, 214.9, 243.7, 136.3, 130.6, 222.2, 306.2, 272.1, 231.1, 274.2,
267.4, 278.4, 201.0, 332.7, 334.7, 148.0, 186.8, 285.5, 129.7, 231.9, 145.4, 251.5, 236.2, 141.7, 222.6, 249.7, 280.8
, 156.9, 119.5, 212.1, 292.1, 158.5, 120.4, 88.7, 73.7, 230.0, 199.0, 268.6, 219.3, 122.3, 247.9, 242.6, 100.3, 147.9
, 136.1, 207.3, 191.5, 225.8, 91.6, 206.8, 128.7, 111.2, 250.0, 87.4, 53.3, 120.8, 261.2, 138.1, 89.6, 205.6, 168.0,
352.2, 151.3, 124.0, 117.9, 316.7, 262.1, 189.2, 165.5, 313.2, 252.3, 364.9, 234.8, 284.5, 148.8, 157.2, 283.2, 205.9
, 150.6, 143.4, 199.8, 288.1, 61.4, 242.1, 251.3, 223.8, 275.5, 325.9, 217.7, 130.7, 269.3, 174.8, 155.3, 148.4, 262.
```

```
4, 294.6, 256.0, 211.2, 176.9, 175.2, 112.4, 215.3, 292.4, 47.4, 207.6, 232.3, 292.7, 113.8, 131.1, 139.2, 125.6, 274
.9, 234.0, 247.6, 156.8, 131.9, 280.9, 120.1, 279.1]

 Unique values for total night calls
 N-unique values for total night calls is 120
[91, 103, 104, 89, 121, 118, 96, 90, 97, 111, 94, 128, 115, 99, 75, 108, 74, 133, 64, 78, 105, 68, 102, 148, 98, 116,
71, 109, 107, 135, 92, 86, 127, 79, 87, 129, 57, 77, 95, 54, 106, 53, 67, 139, 60, 100, 61, 73, 113, 76, 119, 88, 84,
62, 137, 72, 142, 114, 126, 122, 81, 123, 117, 82, 80, 120, 130, 134, 59, 112, 132, 110, 101, 150, 69, 131, 83, 93, 1
24, 136, 125, 66, 143, 58, 55, 85, 56, 70, 46, 42, 152, 44, 145, 50, 153, 49, 175, 63, 138, 154, 140, 141, 146, 65, 5
1, 151, 158, 155, 157, 147, 144, 149, 166, 52, 33, 156, 38, 36, 48, 164]

 Unique values for total night charge
 N-unique values for total night charge is 933
[11.01, 11.45, 7.32, 8.86, 8.41, 9.18, 9.57, 9.53, 9.71, 14.69, 9.4, 8.82, 6.35, 8.65, 9.14, 7.23, 4.02, 5.83, 7.46,
8.68, 9.43, 8.18, 8.53, 10.67, 11.28, 8.22, 4.59, 8.17, 8.04, 11.27, 11.08, 13.2, 12.61, 9.61, 6.88, 5.82, 10.25, 4.5
8, 8.47, 8.45, 5.5, 14.02, 8.03, 11.94, 7.34, 6.06, 10.9, 6.44, 3.18, 10.66, 11.21, 12.73, 10.28, 12.16, 6.34, 8.15,
5.84, 8.52, 7.5, 7.48, 6.21, 11.95, 7.15, 9.63, 7.1, 6.91, 6.69, 13.29, 11.46, 7.76, 6.86, 8.16, 12.15, 7.79, 7.99, 1
0.29, 10.08, 12.53, 7.91, 10.02, 8.61, 14.54, 8.21, 9.09, 4.93, 11.39, 11.88, 5.75, 7.83, 8.59, 7.52, 12.38, 7.21, 5.
81, 8.1, 11.04, 11.19, 8.55, 8.42, 9.76, 9.87, 10.86, 5.36, 10.03, 11.15, 9.51, 6.22, 2.59, 7.65, 6.45, 9.0, 6.4, 9.9
4, 5.08, 10.23, 11.36, 6.97, 10.16, 7.88, 11.91, 6.61, 11.55, 11.76, 9.27, 9.29, 11.12, 10.69, 8.8, 11.85, 7.14, 8.71
, 11.42, 4.94, 9.02, 11.22, 4.97, 9.15, 5.45, 7.27, 12.91, 7.75, 13.46, 6.32, 12.13, 11.97, 6.93, 11.66, 7.42, 6.19,
11.41, 10.33, 10.65, 11.92, 4.77, 4.38, 7.41, 12.1, 7.69, 8.78, 9.36, 9.05, 12.7, 6.16, 6.05, 10.85, 8.93, 3.48, 10.4
, 5.05, 10.71, 9.37, 6.75, 8.12, 11.77, 11.49, 11.06, 11.25, 11.03, 10.82, 8.91, 8.57, 8.09, 10.05, 11.7, 10.17, 8.74
, 5.51, 11.11, 3.29, 10.13, 6.8, 8.49, 9.55, 11.02, 9.91, 7.84, 10.62, 9.97, 3.44, 7.35, 9.79, 8.89, 8.14, 6.94, 10.4
9, 10.57, 10.2, 6.29, 8.79, 10.04, 12.41, 15.97, 9.1, 11.78, 12.75, 11.07, 12.56, 8.63, 8.02, 10.42, 8.7, 9.98, 7.62,
8.33, 6.59, 13.12, 10.46, 6.63, 8.32, 9.04, 9.28, 10.76, 9.64, 11.44, 6.48, 10.81, 12.66, 11.34, 8.75, 13.05, 11.48,
14.04, 13.47, 5.63, 6.6, 9.72, 11.68, 6.41, 9.32, 12.95, 13.37, 9.62, 6.03, 8.25, 8.26, 11.96, 9.9, 9.23, 5.58, 7.22,
6.64, 12.29, 12.93, 11.32, 6.85, 8.88, 7.03, 8.48, 3.59, 5.86, 6.23, 7.61, 7.66, 13.63, 7.9, 11.82, 7.47, 6.08, 8.4,
5.74, 10.94, 10.35, 10.68, 4.34, 8.73, 5.14, 8.24, 9.99, 13.93, 8.64, 11.43, 5.79, 9.2, 10.14, 12.11, 7.53, 12.46, 8.
46, 8.95, 9.84, 10.8, 11.23, 10.15, 9.21, 14.46, 6.67, 12.83, 9.66, 9.59, 10.48, 8.36, 4.84, 10.54, 8.39, 7.43, 9.06,
8.94, 11.13, 8.87, 8.5, 7.6, 10.73, 9.56, 10.77, 7.73, 3.47, 11.86, 8.11, 9.78, 9.42, 9.65, 7.0, 7.39, 9.88, 6.56, 5.
92, 6.95, 15.71, 8.06, 4.86, 7.8, 8.58, 10.06, 5.21, 6.92, 6.15, 13.49, 9.38, 12.62, 12.26, 8.19, 11.65, 11.62, 10.83
, 7.92, 7.33, 13.01, 13.26, 12.22, 11.58, 5.97, 10.99, 8.38, 9.17, 8.08, 5.71, 3.41, 12.63, 11.79, 12.96, 7.64, 6.58,
10.84, 10.22, 6.52, 5.55, 7.63, 5.11, 5.89, 10.78, 3.05, 11.89, 8.97, 10.44, 10.5, 9.35, 5.66, 11.09, 9.83, 5.44, 10.
11, 6.39, 11.93, 8.62, 12.06, 6.02, 8.85, 5.25, 8.66, 6.73, 10.21, 11.59, 13.87, 7.77, 10.39, 5.54, 6.62, 13.33, 6.24
, 12.59, 6.3, 6.79, 8.28, 9.03, 8.07, 5.52, 12.14, 10.59, 7.54, 7.67, 5.47, 8.81, 8.51, 13.45, 8.77, 6.43, 12.01, 12.
08, 7.07, 6.51, 6.84, 9.48, 13.78, 11.54, 11.67, 8.13, 10.79, 7.13, 4.72, 4.64, 8.96, 13.03, 6.07, 3.51, 6.83, 6.12,
9.31, 9.58, 4.68, 5.32, 9.26, 11.52, 9.11, 10.55, 11.47, 9.3, 13.82, 8.44, 5.77, 10.96, 11.74, 8.9, 10.47, 7.85, 10.9
2, 4.74, 9.74, 10.43, 9.96, 10.18, 9.54, 7.89, 12.36, 8.54, 10.07, 9.46, 7.3, 11.16, 9.16, 10.19, 5.99, 10.88, 5.8, 7
.19, 4.55, 8.31, 8.01, 14.43, 8.3, 14.3, 6.53, 8.2, 11.31, 13.0, 6.42, 4.24, 7.44, 7.51, 13.1, 9.49, 6.14, 8.76, 6.65
, 10.56, 6.72, 8.29, 12.09, 5.39, 2.96, 7.59, 7.24, 4.28, 9.7, 8.83, 13.3, 11.37, 9.33, 5.01, 3.26, 11.71, 8.43, 9.68
, 15.56, 9.8, 3.61, 6.96, 11.61, 12.81, 10.87, 13.84, 5.03, 5.17, 2.03, 10.34, 9.34, 7.95, 10.09, 9.95, 7.11, 9.22, 6
```

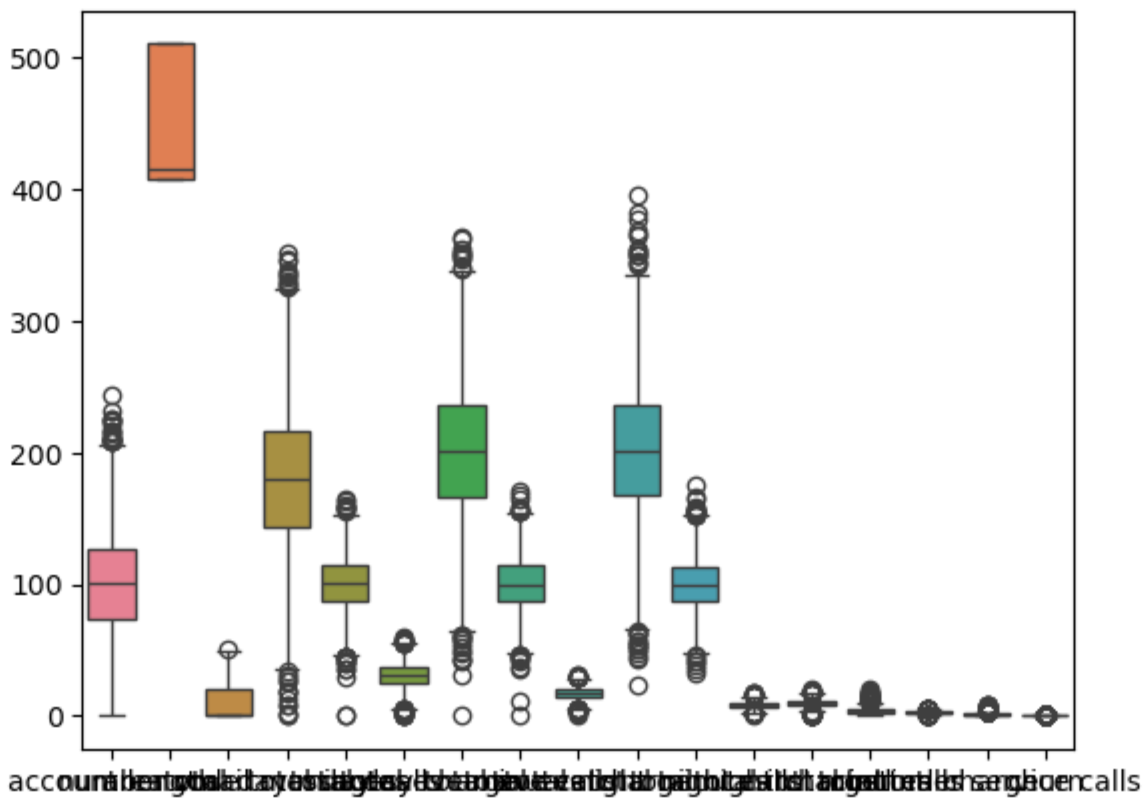
```
.13, 11.05, 9.89, 9.39, 14.06, 10.26, 13.31, 15.43, 16.39, 6.27, 10.64, 11.5, 12.48, 8.27, 13.53, 10.36, 12.24, 8.69,
10.52, 9.07, 11.51, 9.25, 8.72, 6.78, 8.6, 11.84, 5.78, 5.85, 12.3, 5.76, 12.07, 9.6, 8.84, 12.39, 10.1, 9.73, 2.85,
6.66, 2.45, 5.28, 11.73, 10.75, 7.74, 6.76, 6.0, 7.58, 13.69, 7.93, 7.68, 9.75, 4.96, 5.49, 11.83, 7.18, 9.19, 7.7, 7
.25, 10.74, 4.27, 13.8, 9.12, 4.75, 7.78, 11.63, 7.55, 2.25, 9.45, 9.86, 7.71, 4.95, 7.4, 11.17, 11.33, 6.82, 13.7, 1
.97, 10.89, 12.77, 10.31, 5.23, 5.27, 9.41, 6.09, 10.61, 7.29, 4.23, 7.57, 3.67, 12.69, 14.5, 5.95, 7.87, 5.96, 5.94,
12.23, 4.9, 12.33, 6.89, 9.67, 12.68, 12.87, 3.7, 6.04, 13.13, 15.74, 11.87, 4.7, 4.67, 7.05, 5.42, 4.09, 5.73, 9.47,
8.05, 6.87, 3.71, 15.86, 7.49, 11.69, 6.46, 10.45, 12.9, 5.41, 11.26, 1.04, 6.49, 6.37, 12.21, 6.77, 12.65, 7.86, 9.4
4, 4.3, 7.38, 5.02, 10.63, 2.86, 17.19, 8.67, 8.37, 6.9, 10.93, 10.38, 7.36, 10.27, 10.95, 6.11, 4.45, 11.9, 15.01, 1
2.84, 7.45, 6.98, 11.72, 7.56, 11.38, 10.0, 4.42, 9.81, 5.56, 6.01, 10.12, 12.4, 16.99, 5.68, 11.64, 3.78, 7.82, 9.85
, 13.74, 12.71, 10.98, 10.01, 9.52, 7.31, 8.35, 11.35, 9.5, 14.03, 3.2, 7.72, 13.22, 10.7, 8.99, 10.6, 13.02, 9.77, 1
2.58, 12.35, 12.2, 11.4, 13.91, 3.57, 14.65, 12.28, 5.13, 10.72, 12.86, 14.0, 7.12, 12.17, 4.71, 6.28, 8.0, 7.01, 5.9
1, 5.2, 12.0, 12.02, 12.88, 7.28, 5.4, 12.04, 5.24, 10.3, 10.41, 13.41, 12.72, 9.08, 7.08, 13.5, 5.35, 12.45, 5.3, 10
.32, 5.15, 12.67, 5.22, 5.57, 3.94, 4.41, 13.27, 10.24, 4.25, 12.89, 5.72, 12.5, 11.29, 3.25, 11.53, 9.82, 7.26, 4.1,
10.37, 4.98, 6.74, 12.52, 14.56, 8.34, 3.82, 3.86, 13.97, 11.57, 6.5, 13.58, 14.32, 13.75, 11.14, 14.18, 9.13, 4.46,
4.83, 9.69, 14.13, 7.16, 7.98, 13.66, 14.78, 11.2, 9.93, 11.0, 5.29, 9.92, 4.29, 11.1, 10.51, 12.49, 4.04, 12.94, 7.0
9, 6.71, 7.94, 5.31, 5.98, 7.2, 14.82, 13.21, 12.32, 10.58, 4.92, 6.2, 4.47, 11.98, 6.18, 7.81, 4.54, 5.37, 7.17, 5.3
3, 14.1, 5.7, 12.18, 8.98, 5.1, 14.67, 13.95, 16.55, 11.18, 4.44, 4.73, 2.55, 6.31, 2.43, 9.24, 7.37, 13.42, 12.42, 1
1.8, 14.45, 2.89, 13.23, 12.6, 13.18, 12.19, 14.81, 6.55, 11.3, 12.27, 13.98, 8.23, 15.49, 6.47, 13.48, 13.59, 13.25,
17.77, 13.9, 3.97, 11.56, 14.08, 13.6, 6.26, 4.61, 12.76, 15.76, 6.38, 3.6, 12.8, 5.9, 7.97, 5.0, 10.97, 5.88, 12.34,
12.03, 14.97, 15.06, 12.85, 6.54, 11.24, 12.64, 7.06, 5.38, 13.14, 3.99, 3.32, 4.51, 4.12, 3.93, 2.4, 11.75, 4.03, 15
.85, 6.81, 14.25, 14.09, 16.42, 6.7, 12.74, 2.76, 12.12, 6.99, 6.68, 11.81, 7.96, 5.06, 13.16, 2.13, 13.17, 5.12, 5.6
5, 12.37, 10.53]

 Unique values for total intl minutes
 N-unique values for total intl minutes is 162
[10.0, 13.7, 12.2, 6.6, 10.1, 6.3, 7.5, 7.1, 8.7, 11.2, 12.7, 9.1, 12.3, 13.1, 5.4, 13.8, 8.1, 13.0, 10.6, 5.7, 9.5,
7.7, 10.3, 15.5, 14.7, 11.1, 14.2, 12.6, 11.8, 8.3, 14.5, 10.5, 9.4, 14.6, 9.2, 3.5, 8.5, 13.2, 7.4, 8.8, 11.0, 7.8,
6.8, 11.4, 9.3, 9.7, 10.2, 8.0, 5.8, 12.1, 12.0, 11.6, 8.2, 6.2, 7.3, 6.1, 11.7, 15.0, 9.8, 12.4, 8.6, 10.9, 13.9, 8.
9, 7.9, 5.3, 4.4, 12.5, 11.3, 9.0, 9.6, 13.3, 20.0, 7.2, 6.4, 14.1, 14.3, 6.9, 11.5, 15.8, 12.8, 16.2, 0.0, 11.9, 9.9
, 8.4, 10.8, 13.4, 10.7, 17.6, 4.7, 2.7, 13.5, 12.9, 14.4, 10.4, 6.7, 15.4, 4.5, 6.5, 15.6, 5.9, 18.9, 7.6, 5.0, 7.0,
14.0, 18.0, 16.0, 14.8, 3.7, 2.0, 4.8, 15.3, 6.0, 13.6, 17.2, 17.5, 5.6, 18.2, 3.6, 16.5, 4.6, 5.1, 4.1, 16.3, 14.9,
16.4, 16.7, 1.3, 15.2, 15.1, 15.9, 5.5, 16.1, 4.0, 16.9, 5.2, 4.2, 15.7, 17.0, 3.9, 3.8, 2.2, 17.1, 4.9, 17.9, 17.3,
18.4, 17.8, 4.3, 2.9, 3.1, 3.3, 2.6, 3.4, 1.1, 18.3, 16.6, 2.1, 2.4, 2.5]

 Unique values for total intl calls
 N-unique values for total intl calls is 21
[3, 5, 7, 6, 4, 2, 9, 19, 1, 10, 15, 8, 11, 0, 12, 13, 18, 14, 16, 20, 17]

 Unique values for total intl charge
 N-unique values for total intl charge is 162
[2.7, 3.7, 3.29, 1.78, 2.73, 1.7, 2.03, 1.92, 2.35, 3.02, 3.43, 2.46, 3.32, 3.54, 1.46, 3.73, 2.19, 3.51, 2.86, 1.54,
2.57, 2.08, 2.78, 4.19, 3.97, 3.0, 3.83, 3.4, 3.19, 2.24, 3.92, 2.84, 2.54, 3.94, 2.48, 0.95, 2.3, 3.56, 2.0, 2.38, 2
```

```
.97, 2.11, 1.84, 3.08, 2.51, 2.62, 2.75, 2.16, 1.57, 3.27, 3.24, 3.13, 2.21, 1.67, 1.97, 1.65, 3.16, 4.05, 2.65, 3.35
, 2.32, 2.94, 3.75, 2.4, 2.13, 1.43, 1.19, 3.38, 3.05, 2.43, 2.59, 3.59, 5.4, 1.94, 1.73, 3.81, 3.86, 1.86, 3.11, 4.2
7, 3.46, 4.37, 0.0, 3.21, 2.67, 2.27, 2.92, 3.62, 2.89, 4.75, 1.27, 0.73, 3.65, 3.48, 3.89, 2.81, 1.81, 4.16, 1.22, 1
.76, 4.21, 1.59, 5.1, 2.05, 1.35, 1.89, 3.78, 4.86, 4.32, 4.0, 1.0, 0.54, 1.3, 4.13, 1.62, 3.67, 4.64, 4.73, 1.51, 4.
91, 0.97, 4.46, 1.24, 1.38, 1.11, 4.4, 4.02, 4.43, 4.51, 0.35, 4.1, 4.08, 4.29, 1.49, 4.35, 1.08, 4.56, 1.4, 1.13, 4.
24, 4.59, 1.05, 1.03, 0.59, 4.62, 1.32, 4.83, 4.67, 4.97, 4.81, 1.16, 0.78, 0.84, 0.89, 0.7, 0.92, 0.3, 4.94, 4.48, 0
.57, 0.65, 0.68]

 Unique values for customer service calls
 N-unique values for customer service calls is 10
[1, 0, 2, 3, 4, 5, 7, 9, 6, 8]

 Unique values for churn
 N-unique values for churn is 2
[False, True]
```

Other cleaning steps

In [46]:
```
# Outliers

  # Feature engineering

sns.boxplot(df)
```

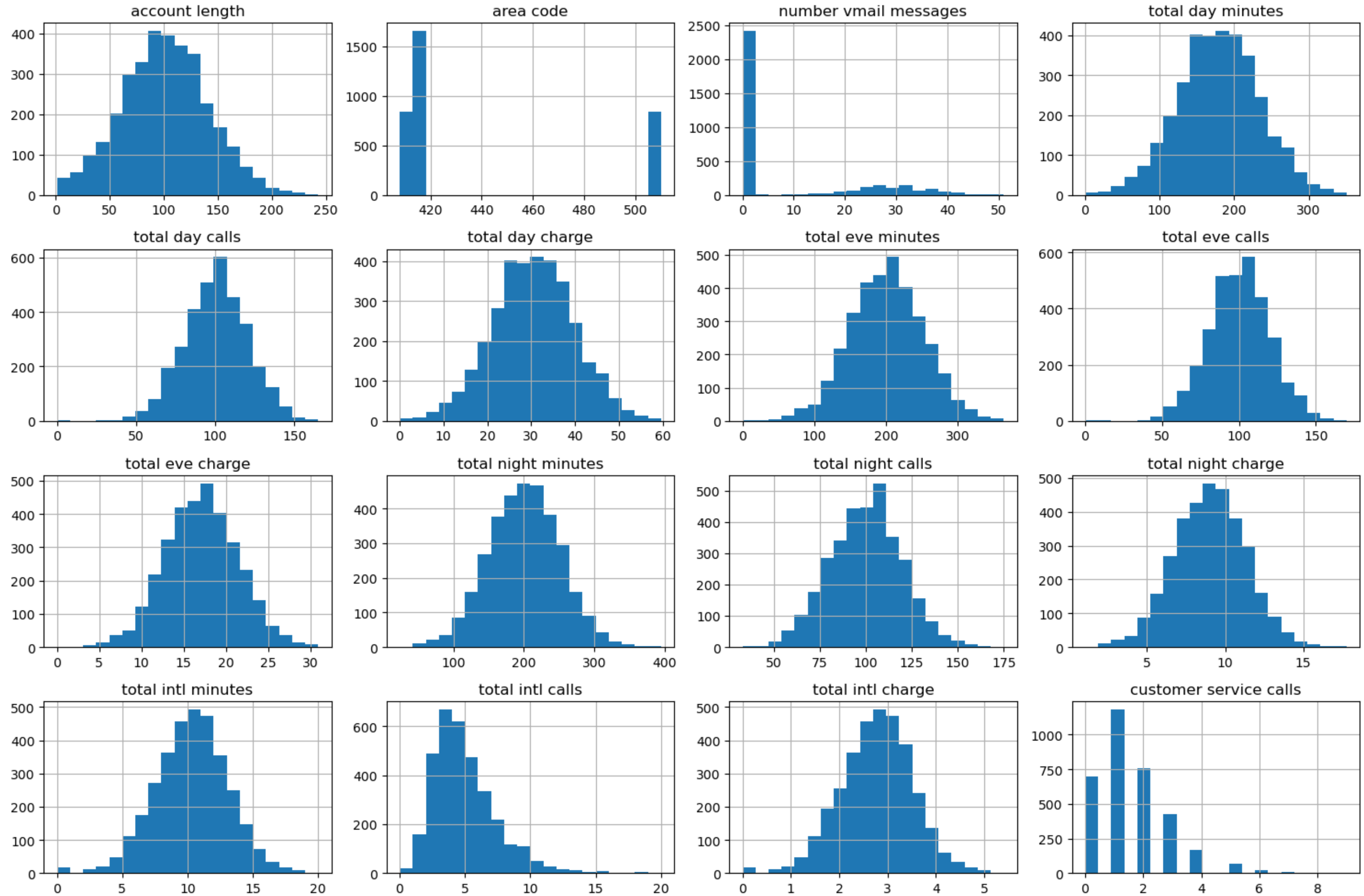
Out[46]:
```
<Axes: >
```




EDA

Histograms for Numerical Columns

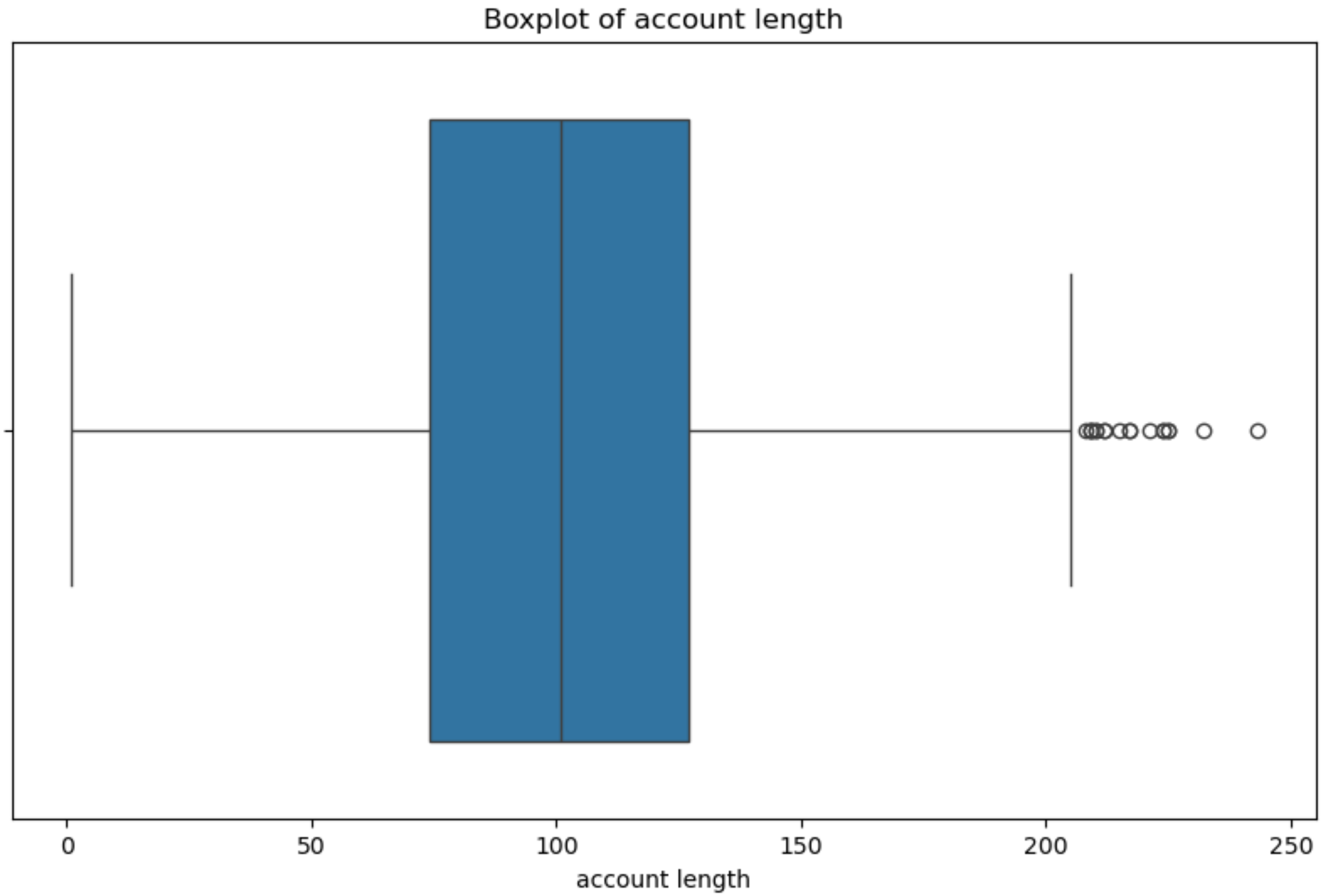
In [47]:
```
# Plot histograms for numeric columns
numeric_columns = df.select_dtypes(include=['float64', 'int64']).columns

df[numeric_columns].hist(bins=20, figsize=(15, 10))
plt.tight_layout()
plt.show()
```

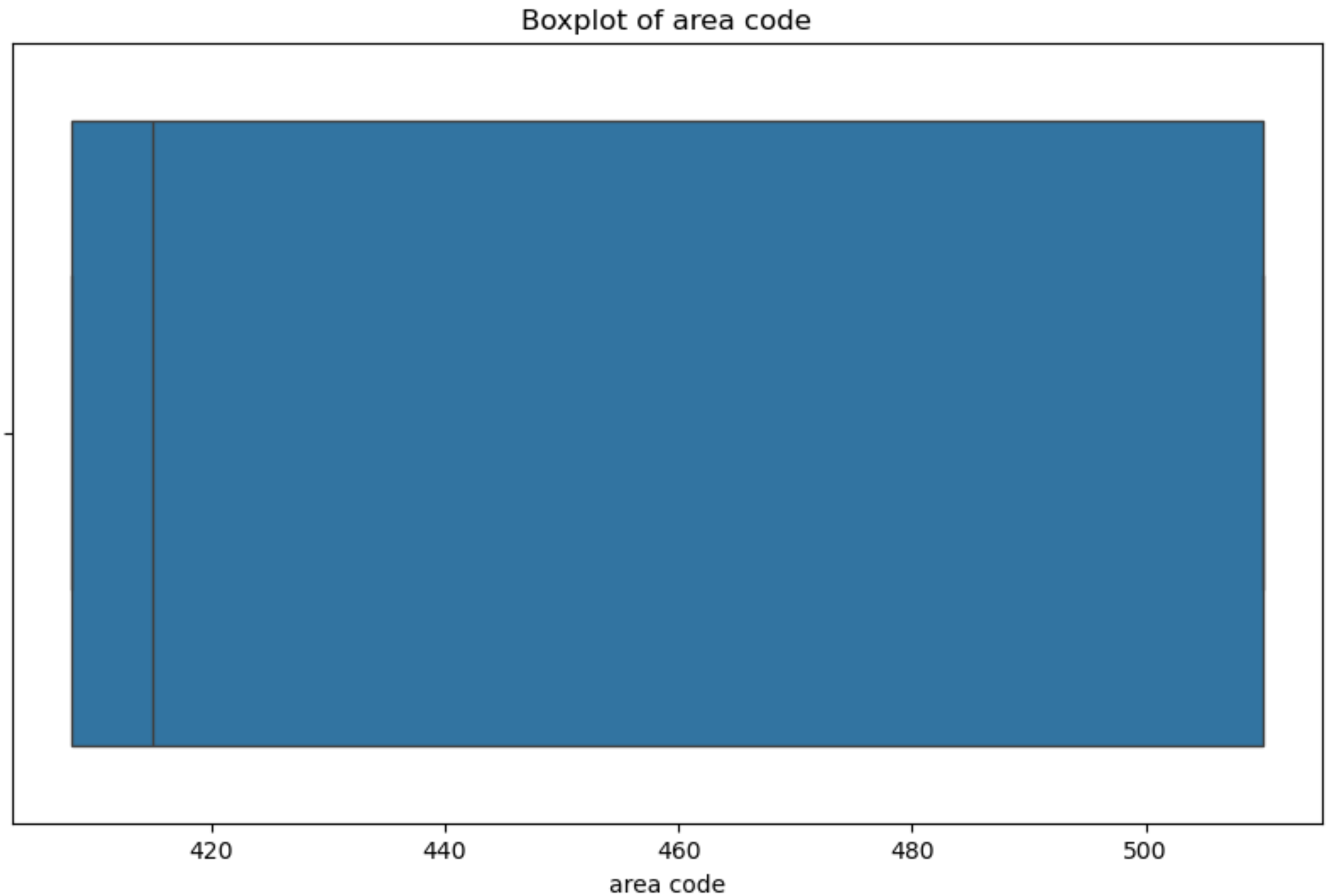


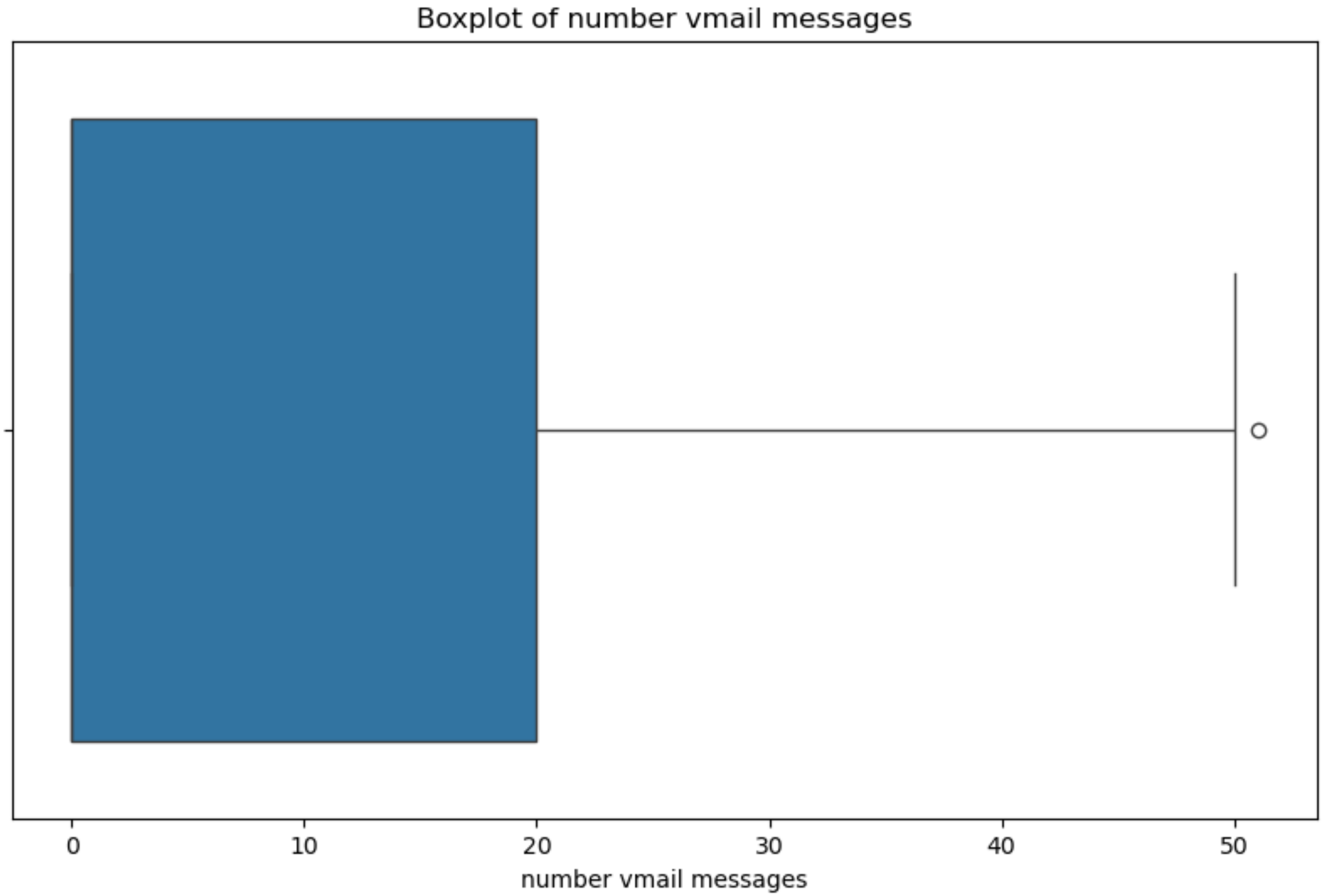

Boxplots for Outliers

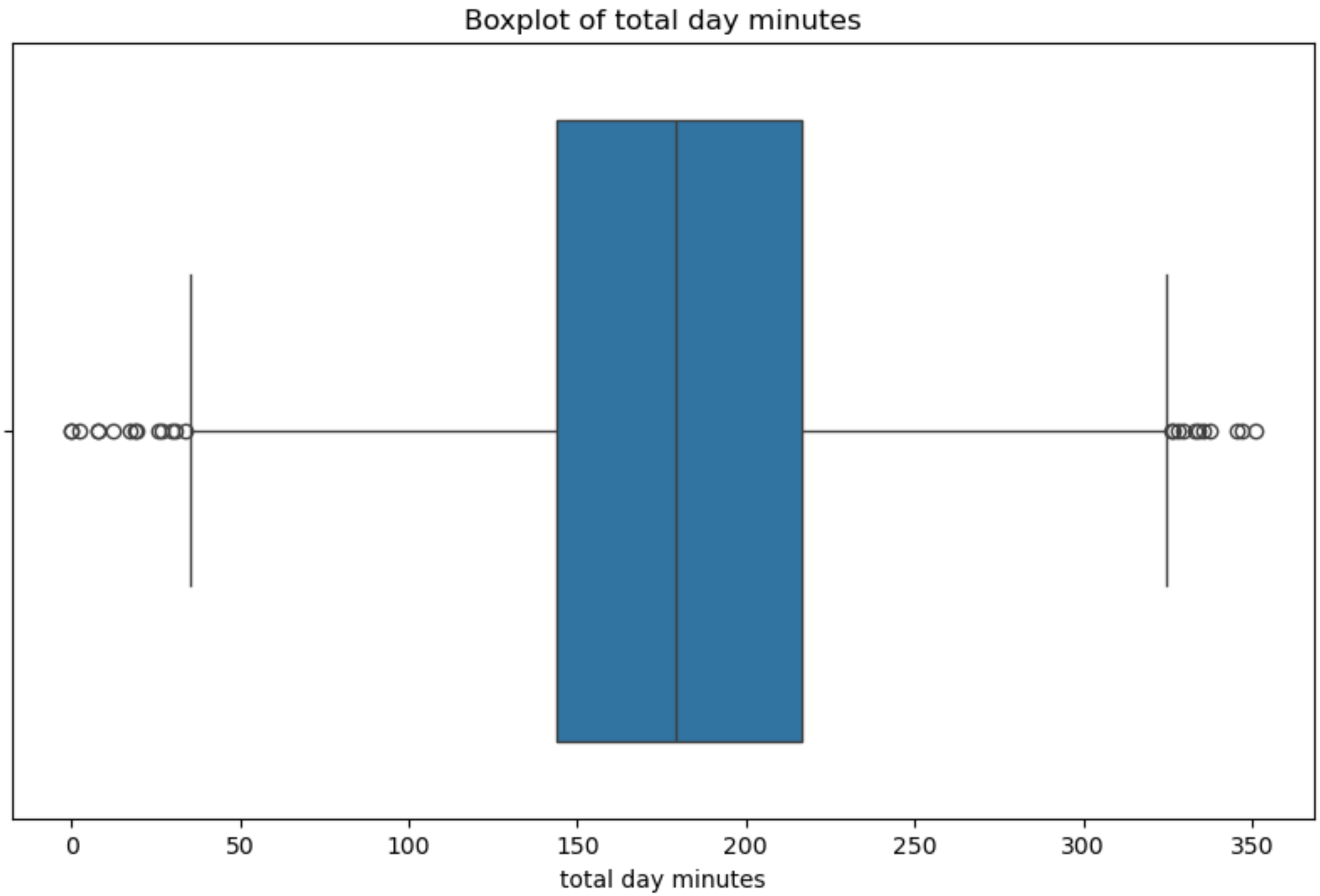
In [48]:
```
# Boxplot for each numeric column
for column in numeric_columns:
    plt.figure(figsize=(10, 6))
    sns.boxplot(x=df[column])
    plt.title(f'Boxplot of {column}')
```

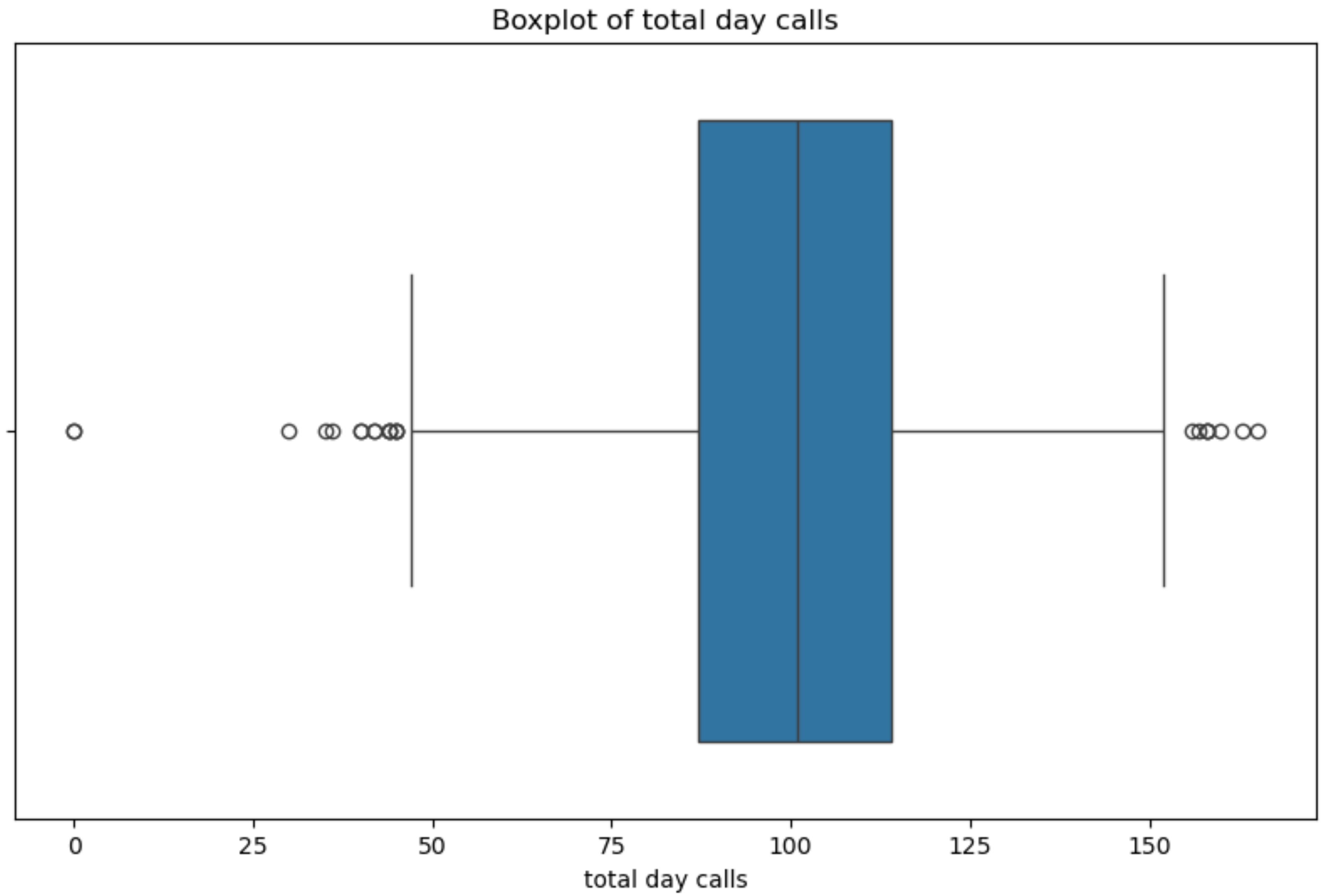
```
plt.show()
```

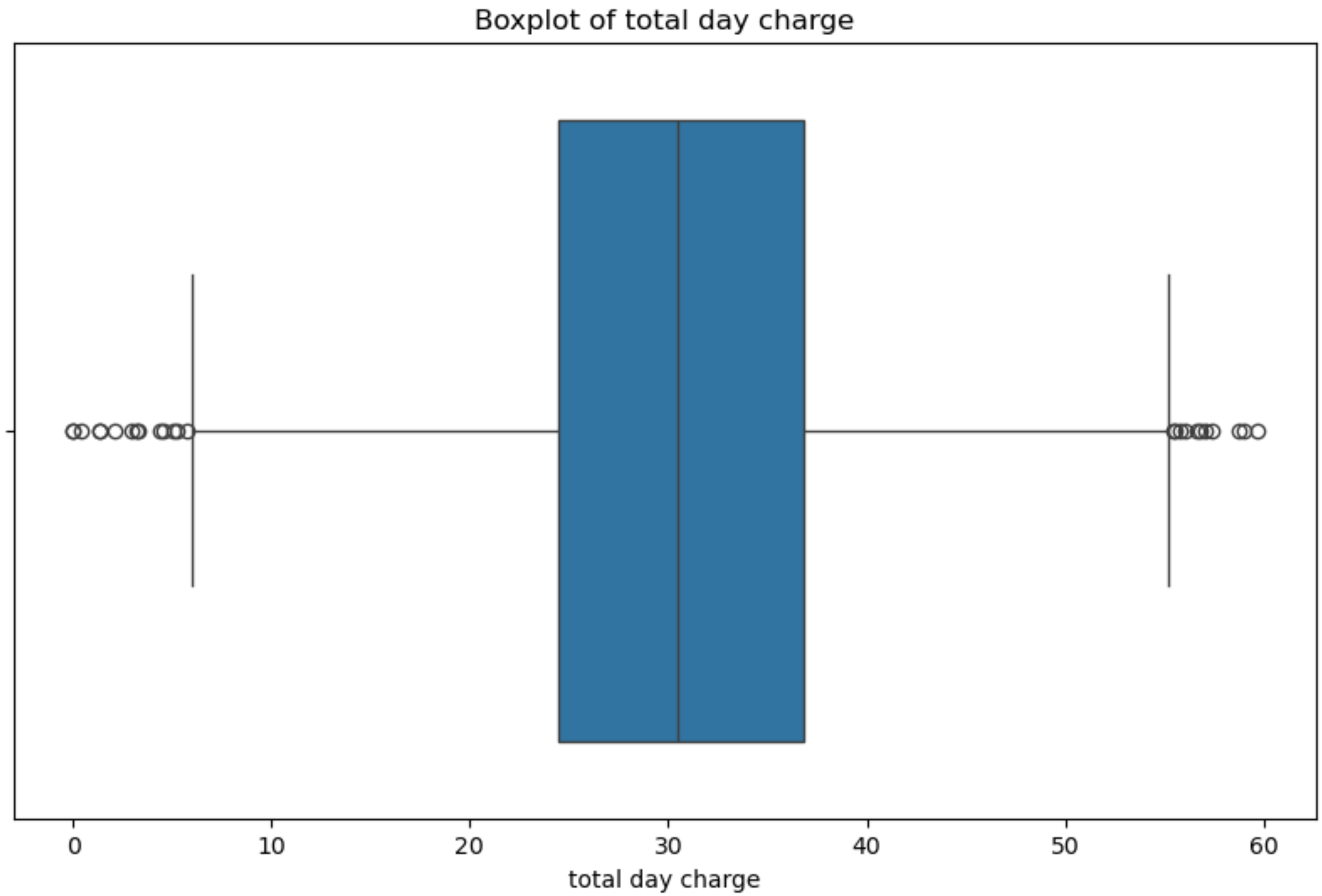

Boxplot of account length
0
50
100
150
200
250
account length

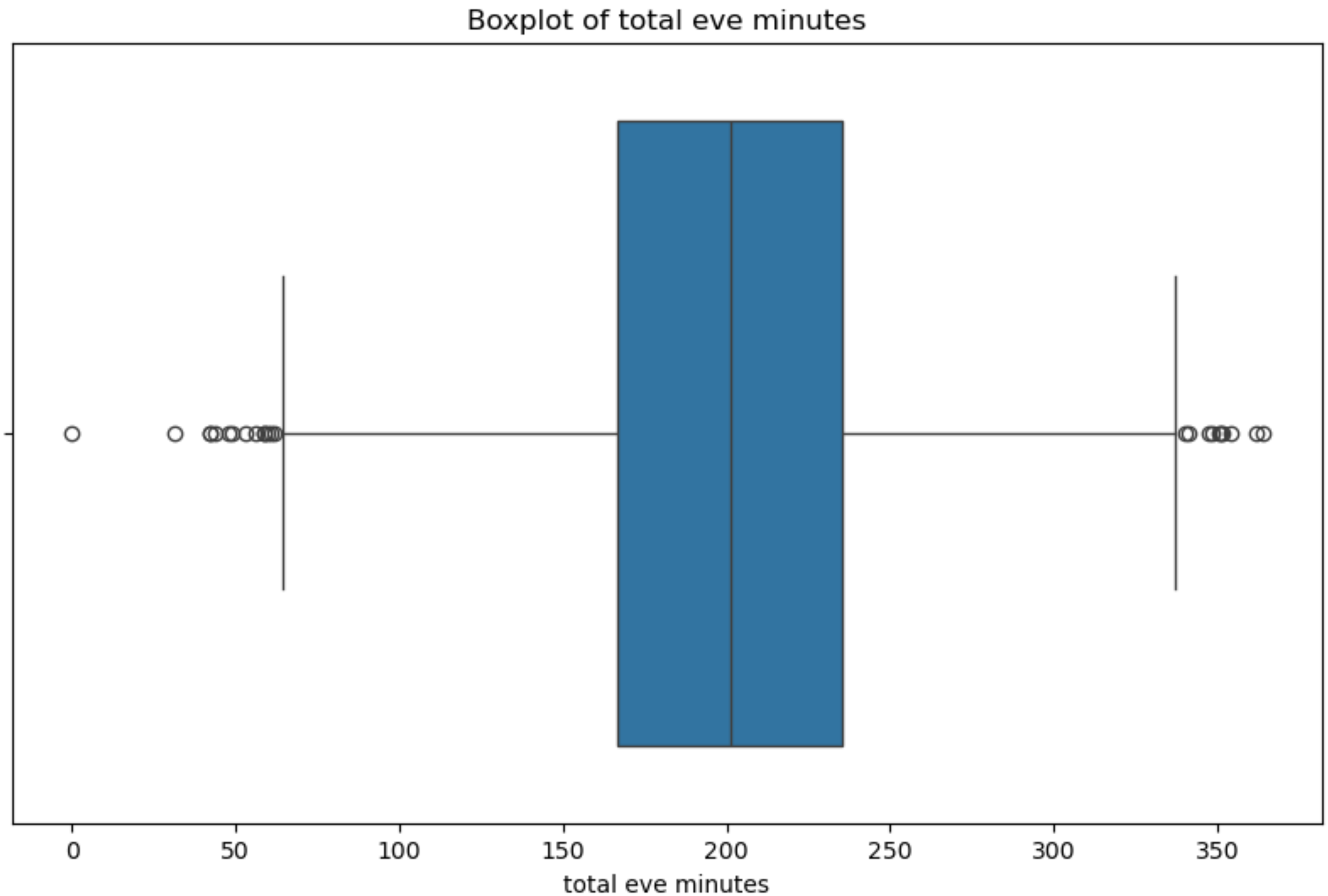

Boxplot of area code
420
440
460
480
500
area code

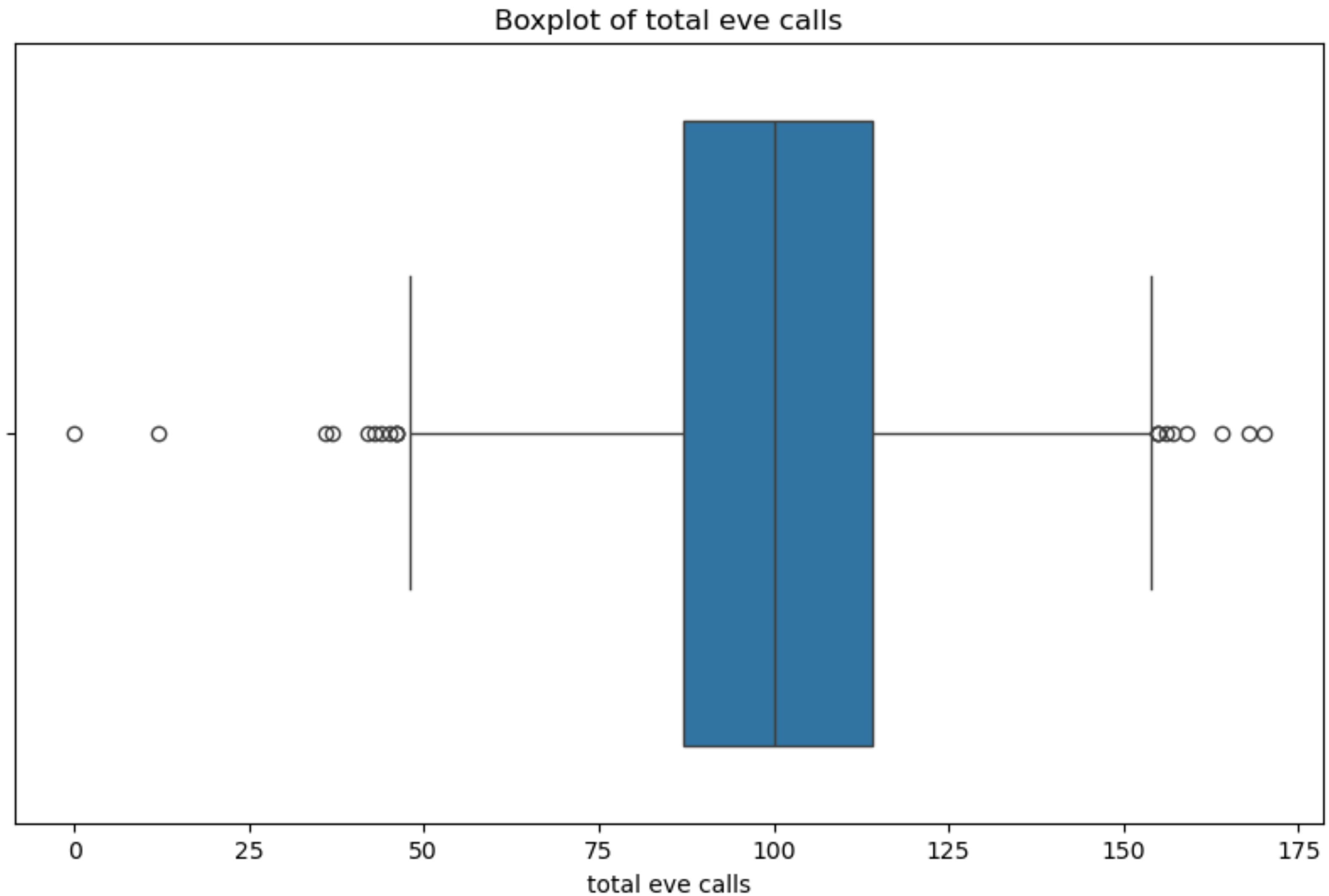

Boxplot of number vmail messages
0
10
20
30
40
50
number vmail messages

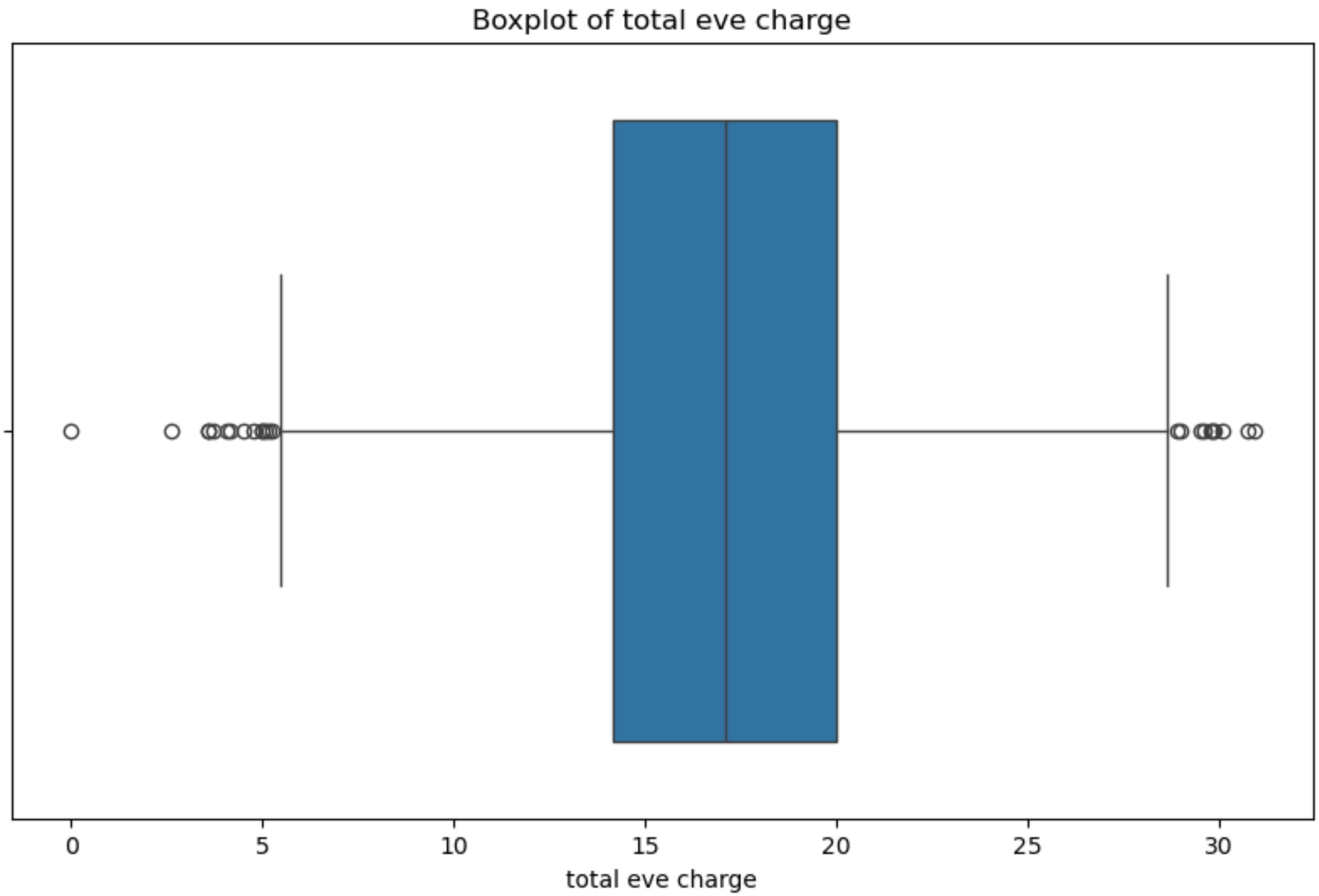

Boxplot of total day minutes
0
50
100
150
200
250
300
350
total day minutes

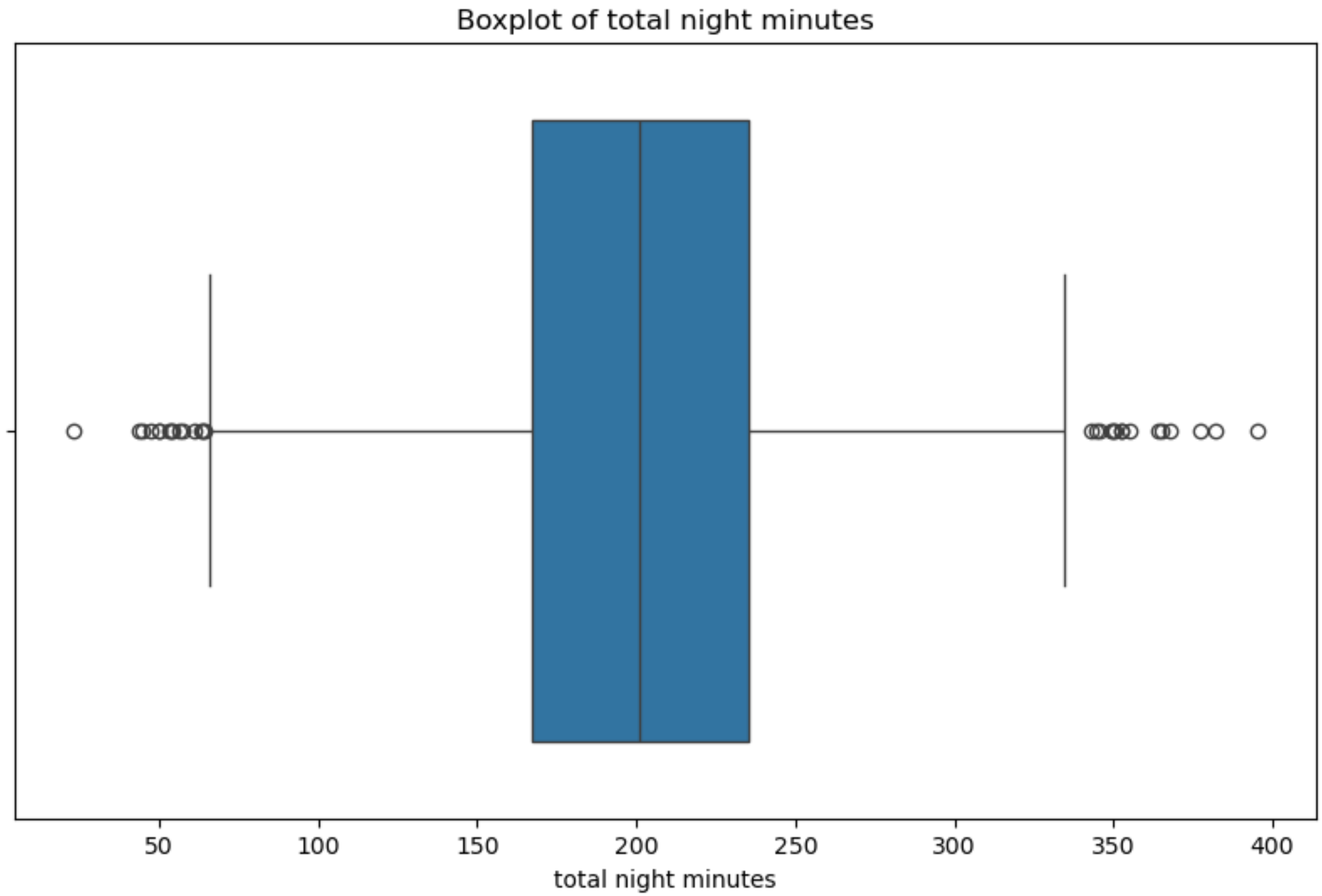

Boxplot of total day calls
0
25
50
75
100
125
150
total day calls

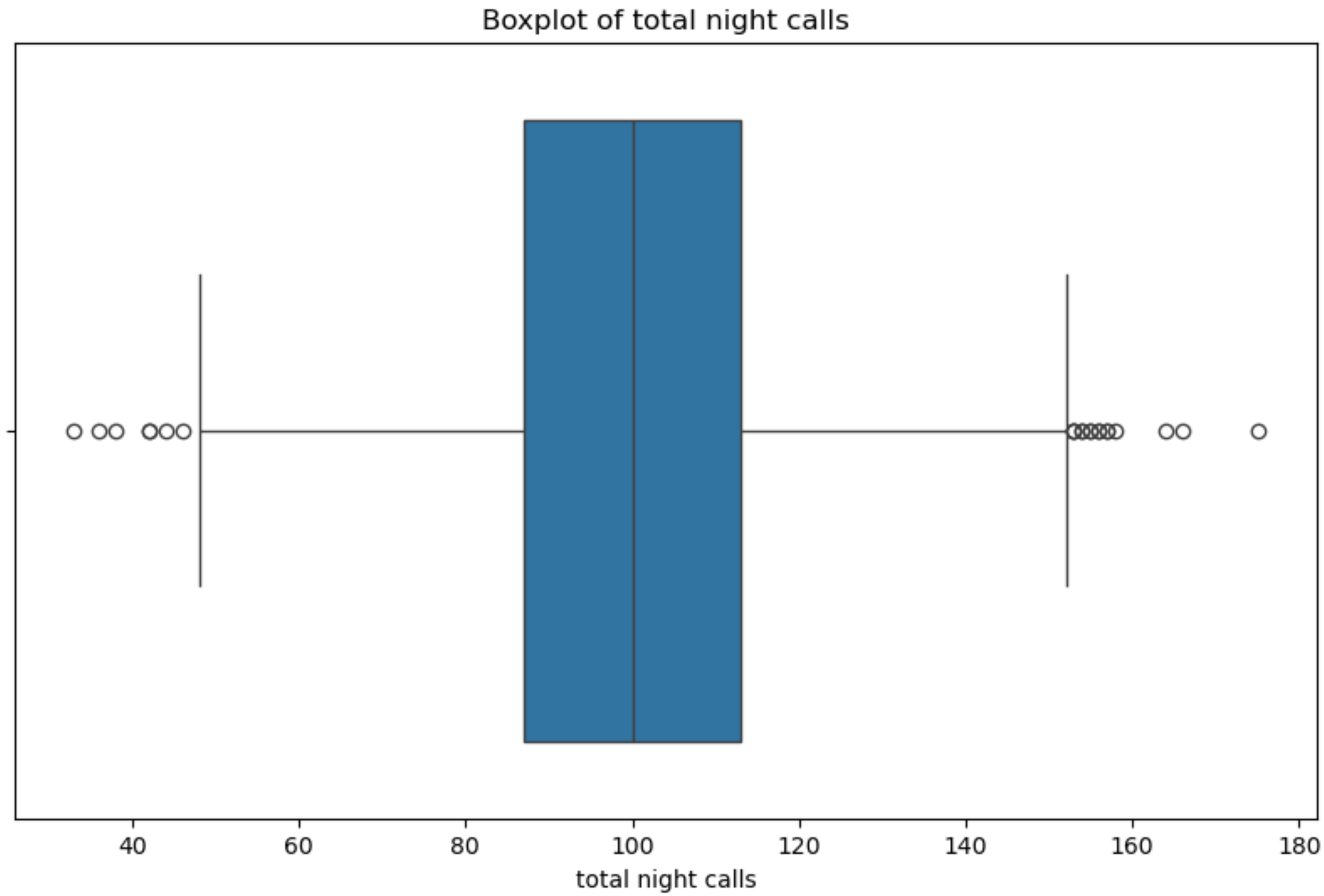

Boxplot of total day charge
0
10
20
30
40
50
60
total day charge

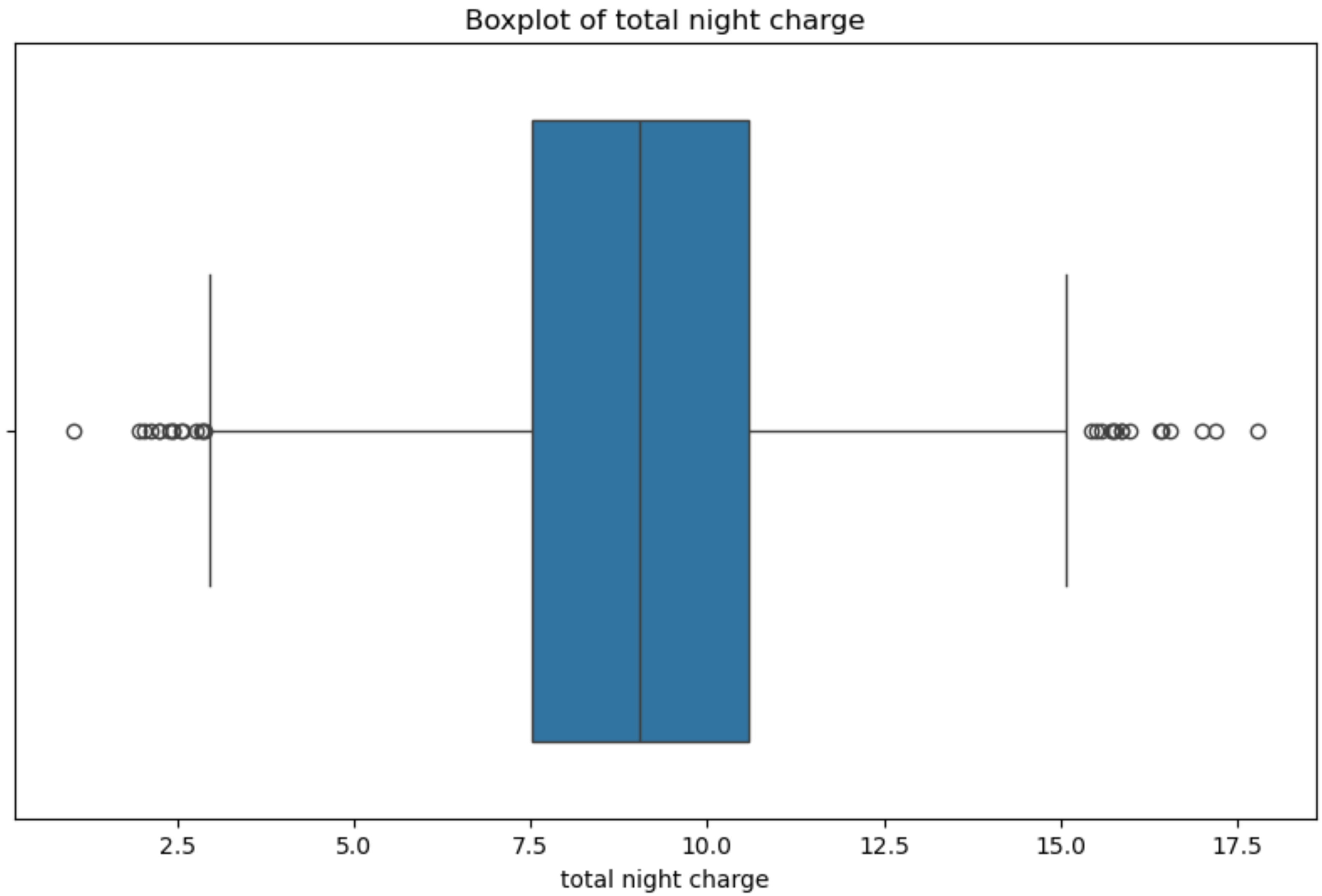

Boxplot of total eve minutes
0
50
100
150
200
250
300
350
total eve minutes

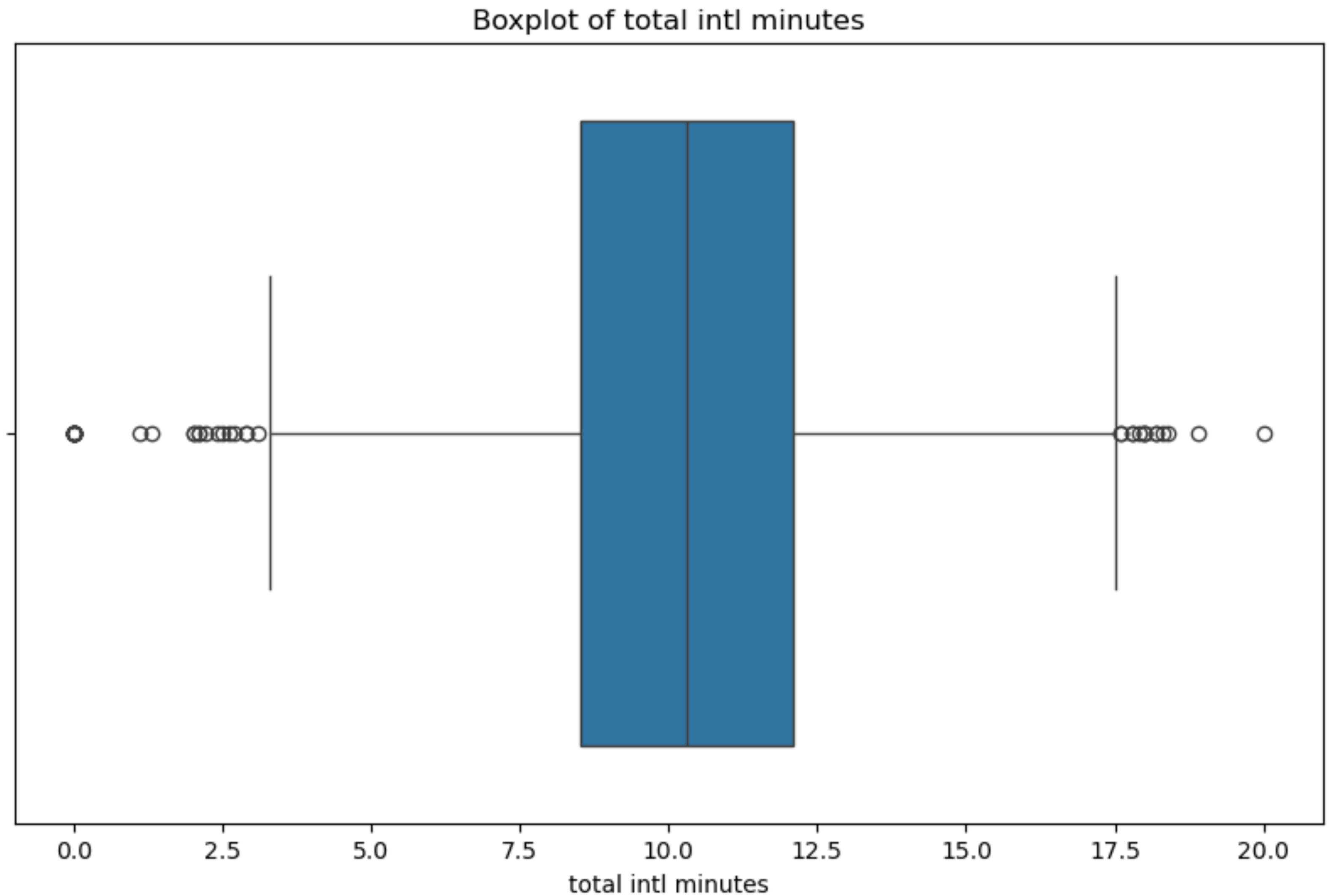

Boxplot of total eve calls
0
25
50
75
100
125
150
175
total eve calls

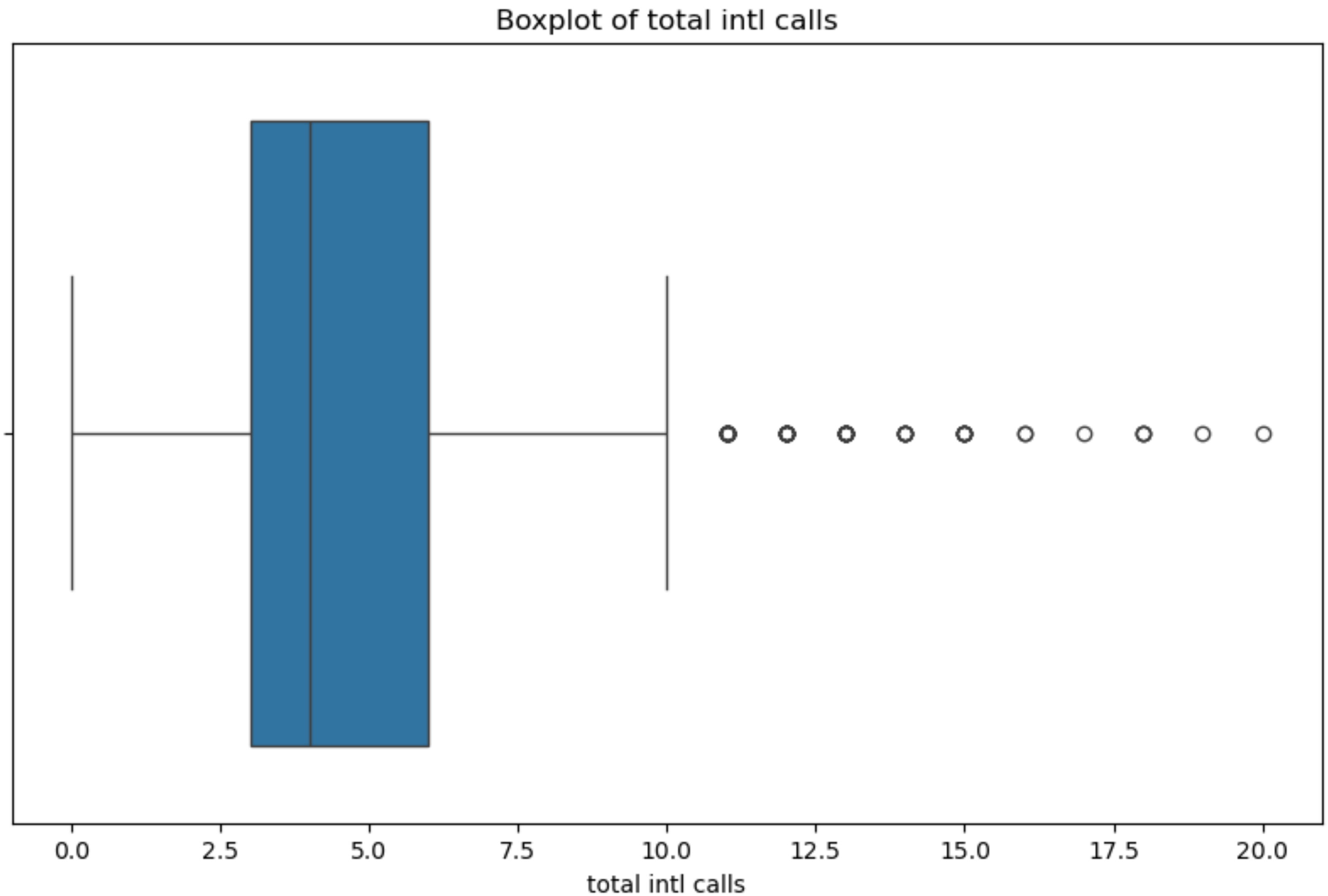

Boxplot of total eve charge
0
5
10
15
20
25
30
total eve charge

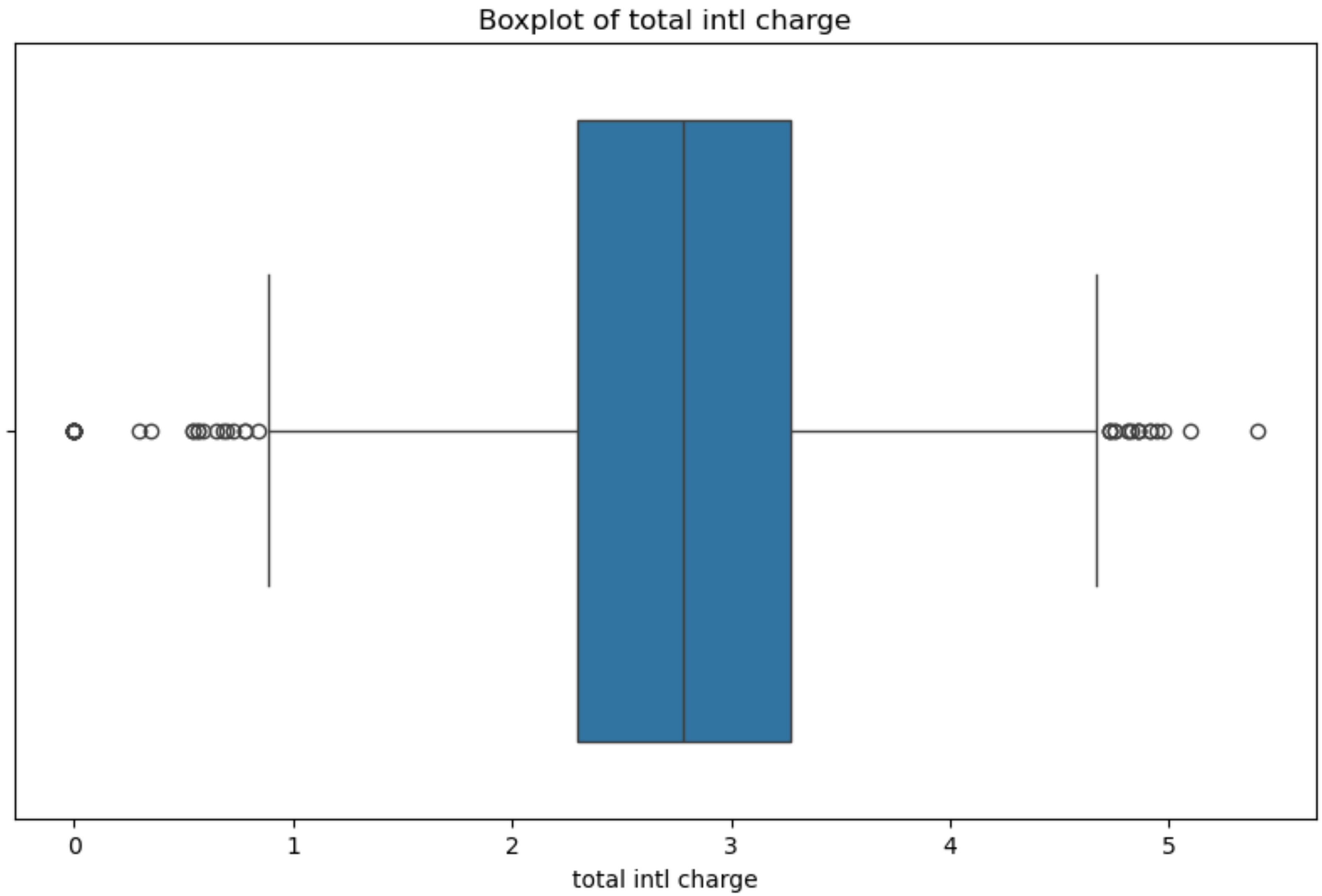

Boxplot of total night minutes
50
100
150
200
250
300
350
400
total night minutes

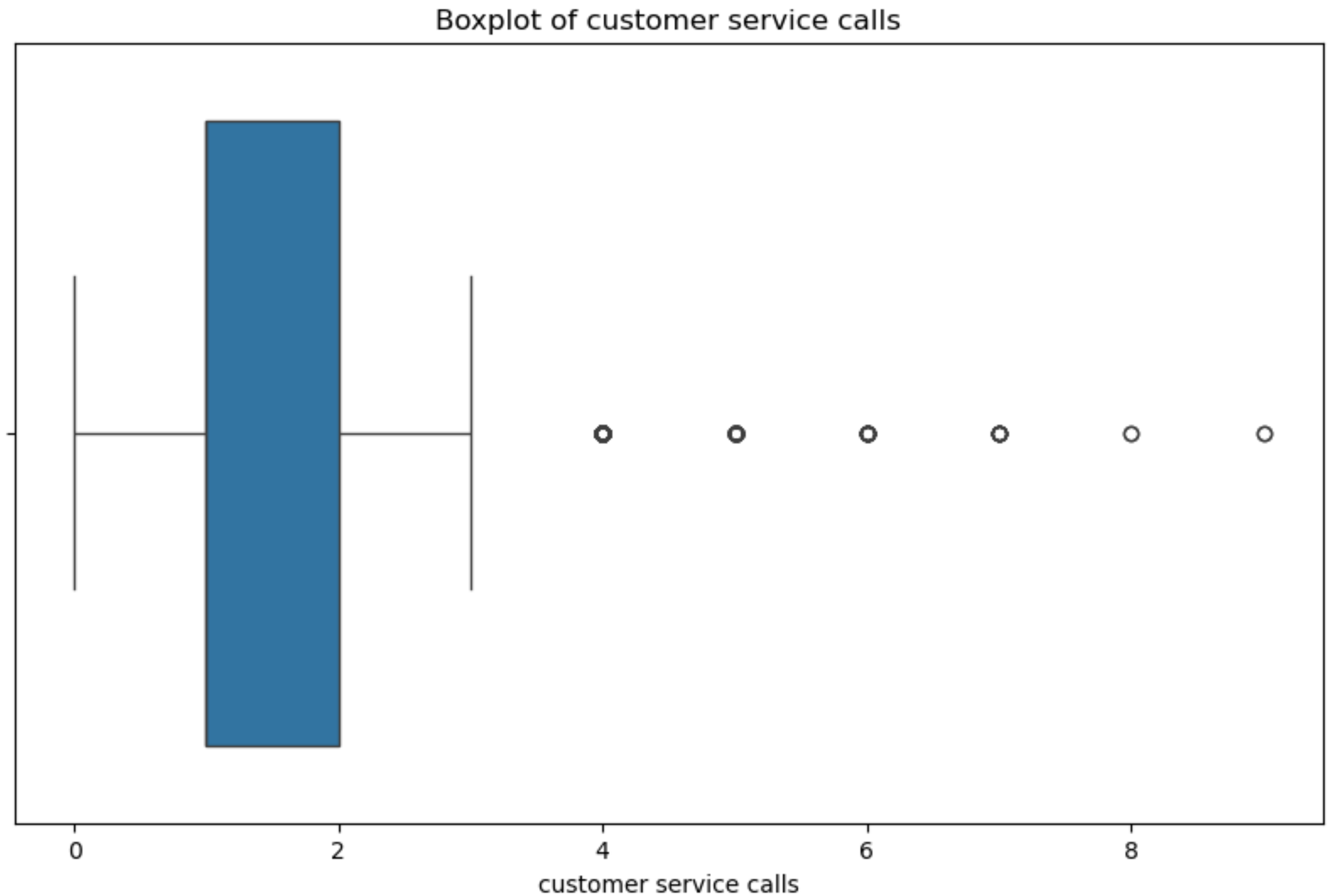

Boxplot of total night calls
40
60
80
100
120
140
160
180
total night calls


Boxplot of total night charge
2.5
5.0
7.5
10.0
12.5
15.0
17.5
total night charge


Boxplot of total intl minutes
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
20.0
total intl minutes


Boxplot of total intl calls
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
20.0
total intl calls


Boxplot of total intl charge
0
1
2
3
4
5
total intl charge




In [49]:
```
# Categorical Data Analysis
```

In [50]:
```
# Frequency count for categorical columns
categorical_columns = df.select_dtypes(include=['object', 'bool']).columns

for column in categorical_columns:
    print(f'{column} value counts:')
    print(df[column].value_counts())
```

```
print('-' * 40)
```

```
state value counts:
state
WV    106
MN     84
NY     83
AL     80
WI     78
OH     78
OR     78
WY     77
VA     77
CT     74
MI     73
ID     73
VT     73
TX     72
UT     72
IN     71
MD     70
KS     70
NC     68
NJ     68
MT     68
CO     66
NV     66
WA     66
RI     65
MA     65
MS     65
AZ     64
FL     63
MO     63
NM     62
ME     62
ND     62
NE     61
OK     61
DE     61
SC     60
SD     60
KY     59
IL     58
```

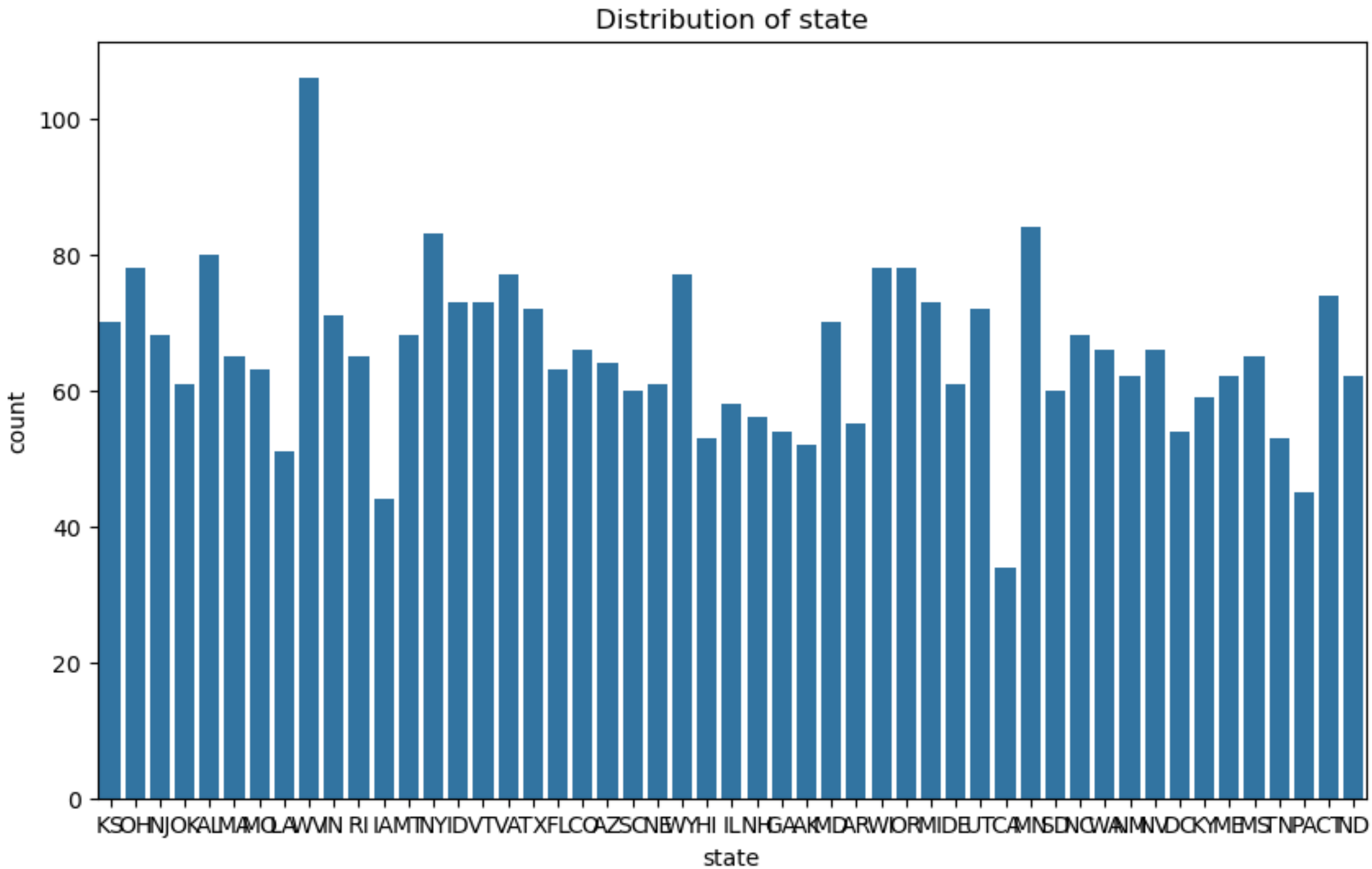
```
NH     56
AR     55
GA     54
DC     54
HI     53
TN     53
AK     52
LA     51
PA     45
IA     44
CA     34
Name: count, dtype: int64
----------------------------------------
phone number value counts:
phone number
382-4657    1
348-7071    1
389-6082    1
415-3689    1
379-2503    1
           ..
352-1127    1
368-1288    1
403-5279    1
397-9333    1
400-4344    1
Name: count, Length: 3333, dtype: int64
----------------------------------------
international plan value counts:
international plan
no     3010
yes     323
Name: count, dtype: int64
----------------------------------------
voice mail plan value counts:
voice mail plan
no     2411
yes     922
Name: count, dtype: int64
----------------------------------------
churn value counts:
churn
```

```
False    2850
True      483
Name: count, dtype: int64
----------------------------------------
```

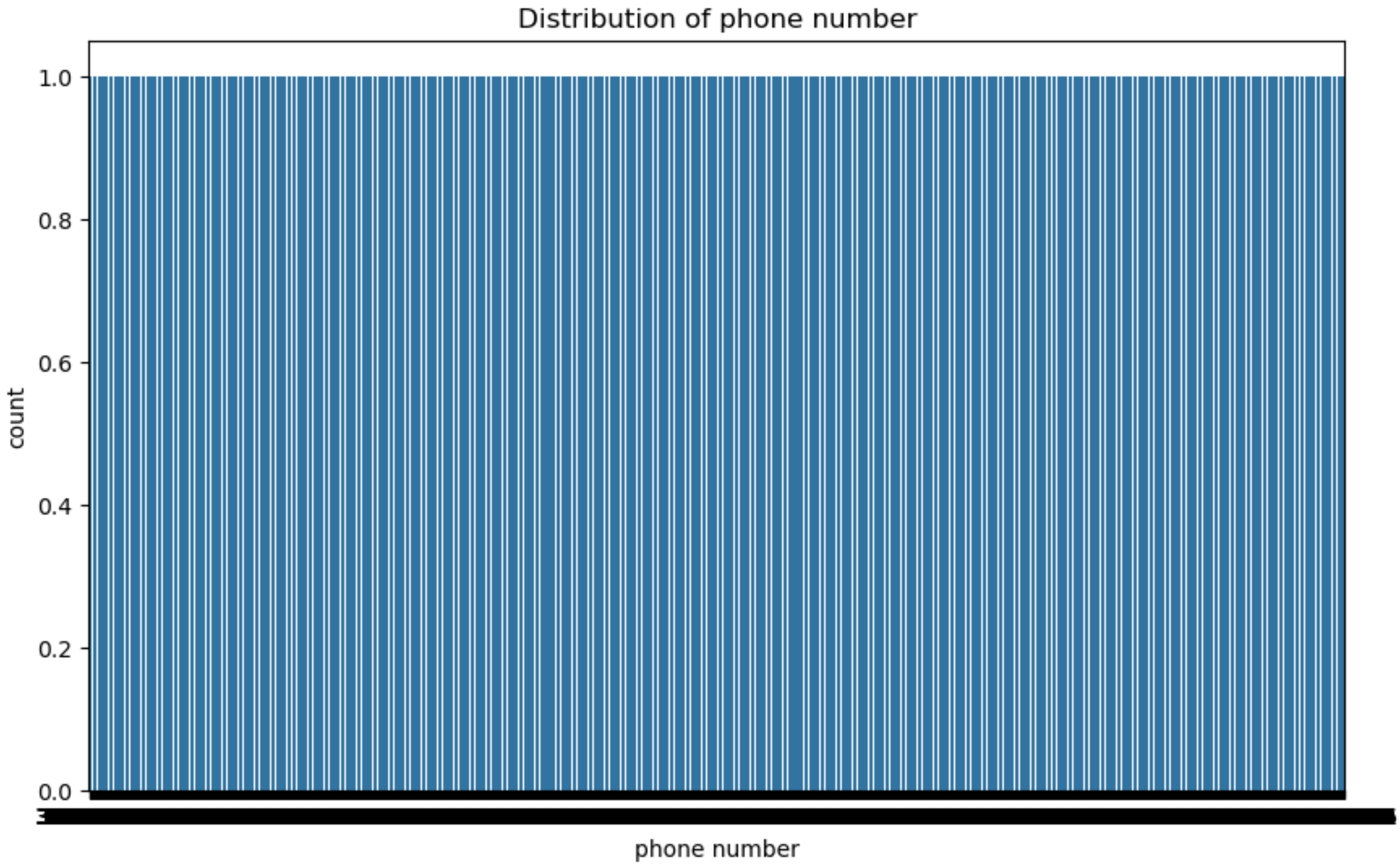
Bar Plots for Categorical Variables

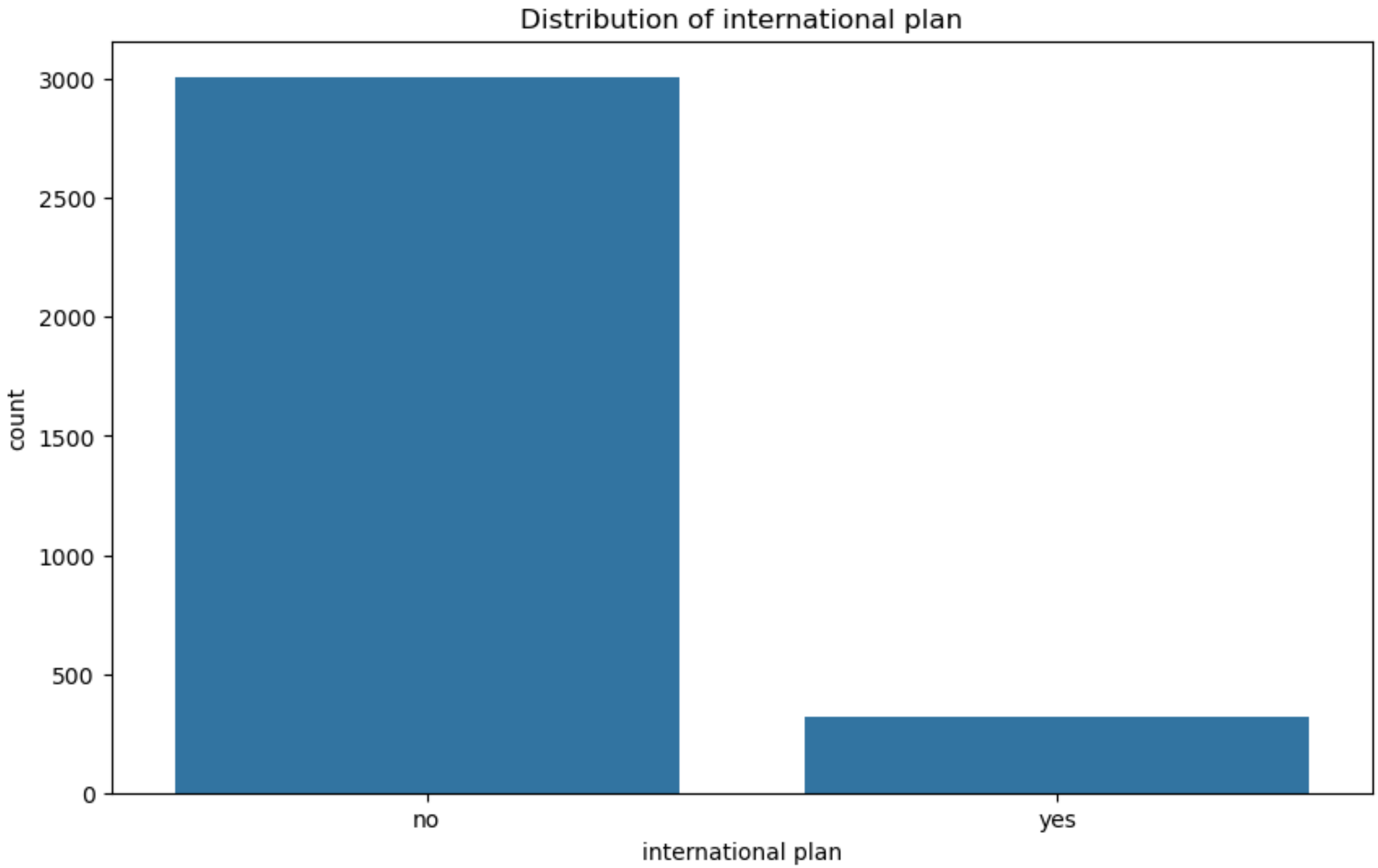
In [51]:

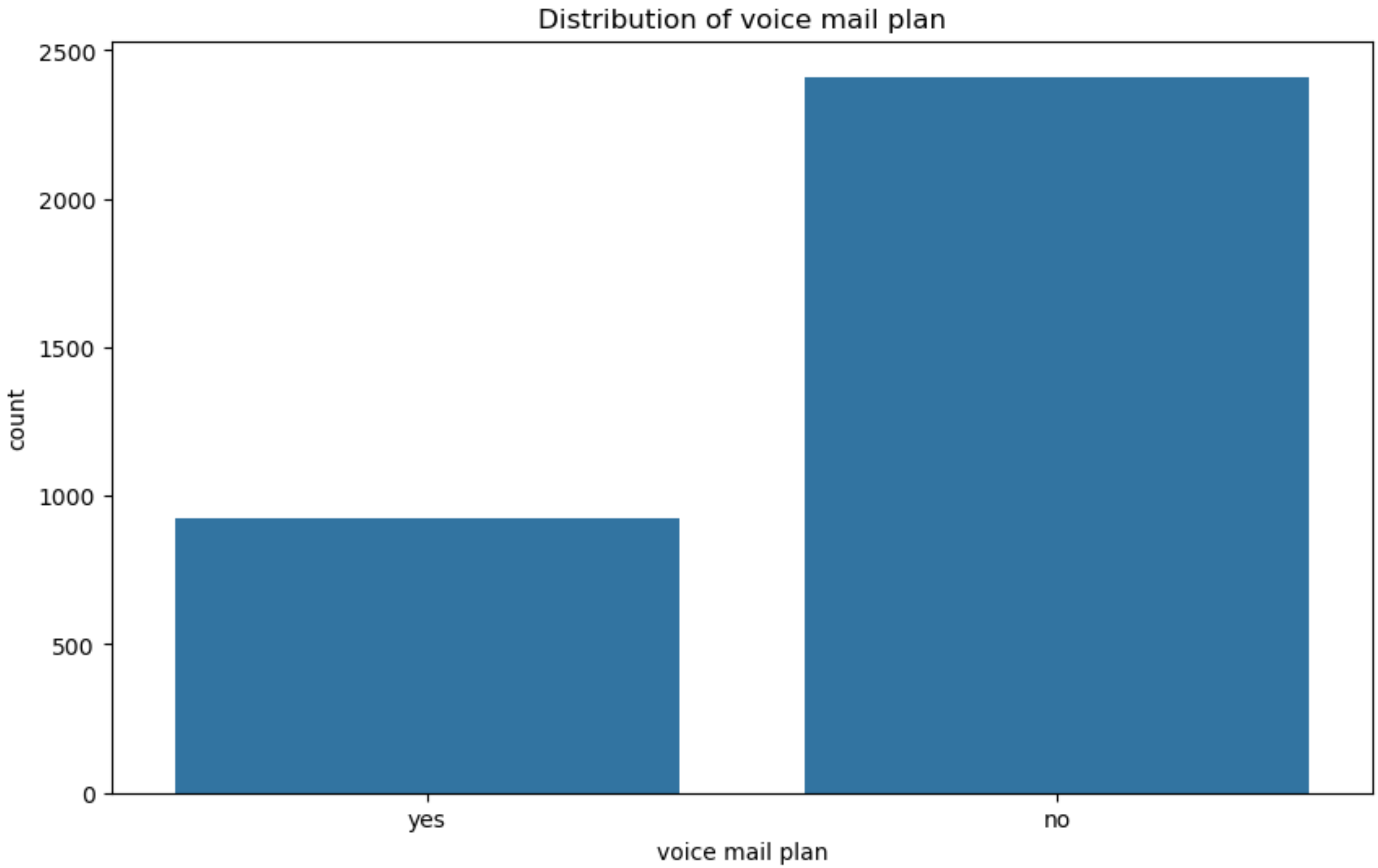
```
# Bar plot for categorical columns
for column in categorical_columns:
    plt.figure(figsize=(10, 6))
    sns.countplot(data=df, x=column)
    plt.title(f'Distribution of {column}')
    plt.show()
```

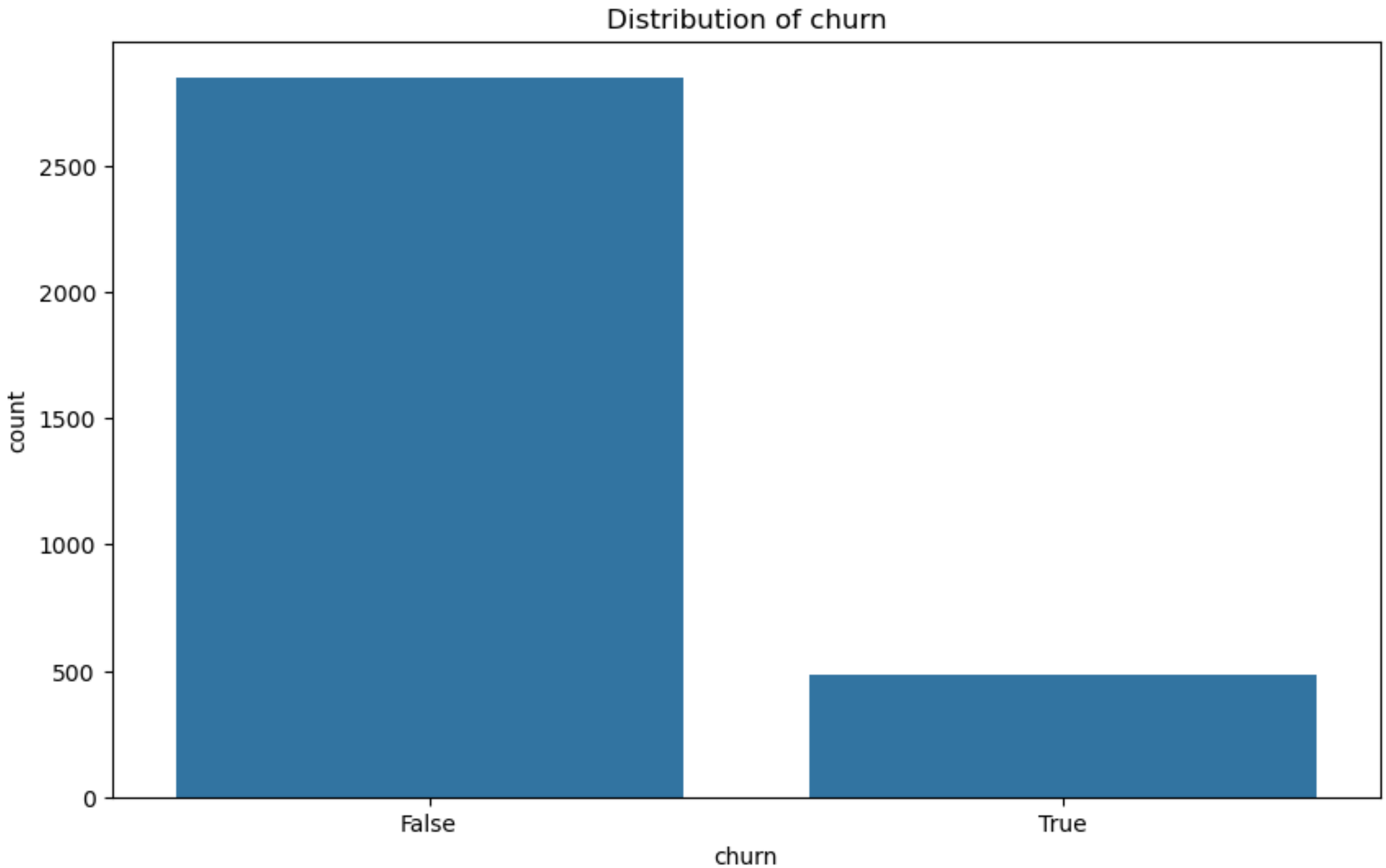


Distribution of state
count
state
0
20
40
60
80
100


Distribution of phone number
count
1.0
0.8
0.6
0.4
0.2
0.0
phone number


Distribution of international plan
count
3000
2500
2000
1500
1000
500
0
no
yes
international plan


Distribution of voice mail plan
2500
2000
1500
1000
500
0
count
yes
no
voice mail plan

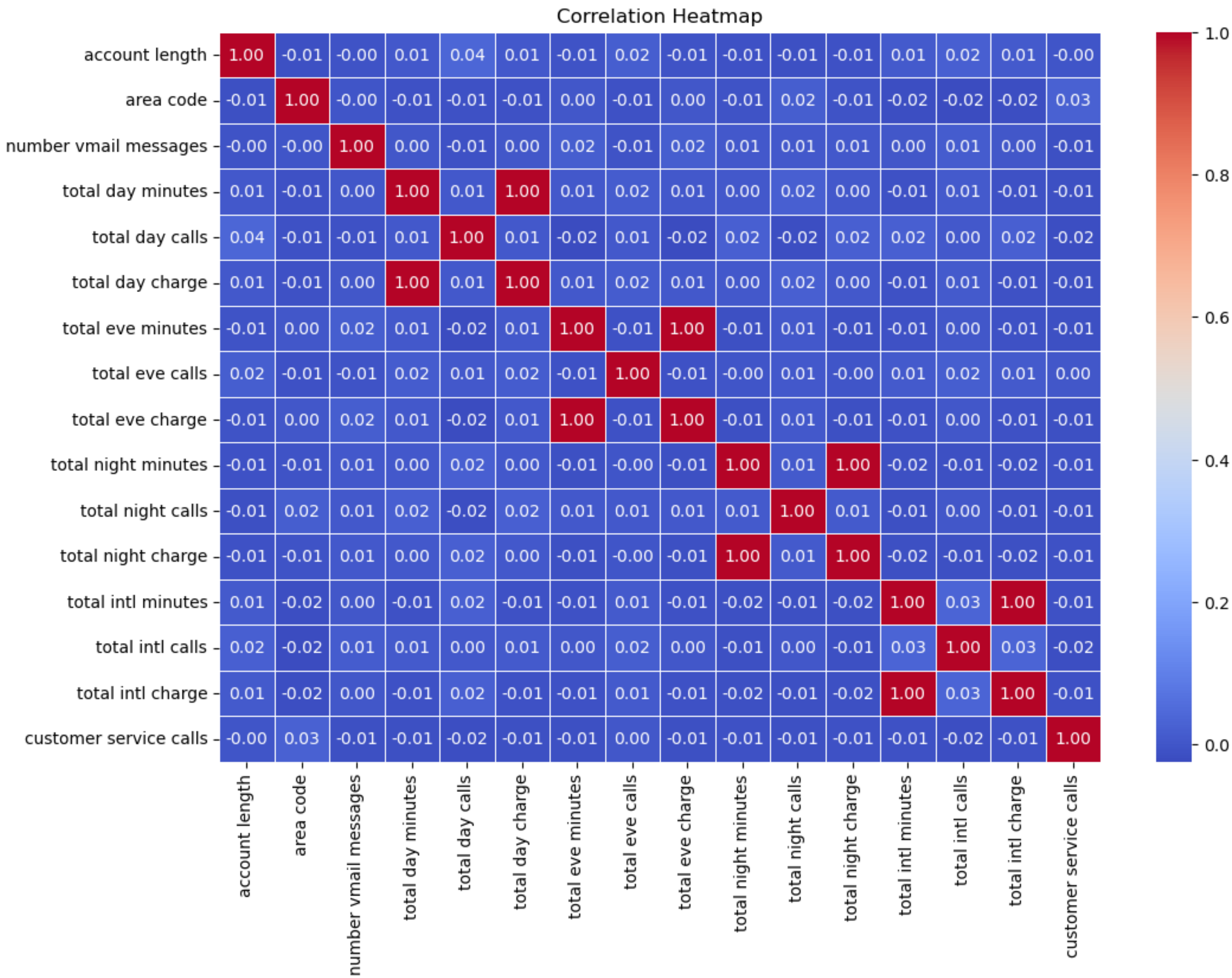



Correlation Analysis

Correlation Matrix

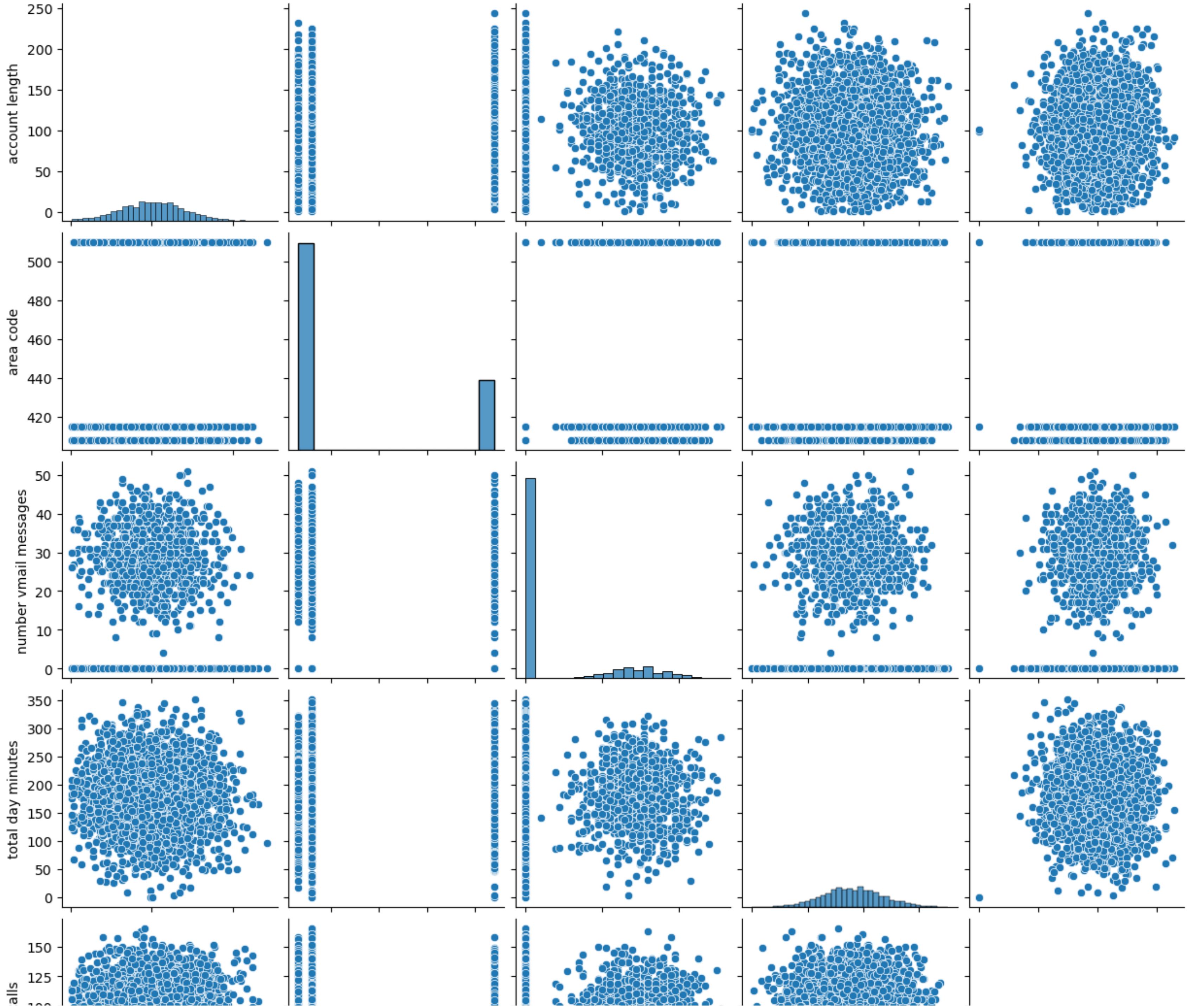
In [52]:
```
# Correlation heatmap
corr = df[numeric_columns].corr()
plt.figure(figsize=(12, 8))
sns.heatmap(corr, annot=True, cmap='coolwarm', fmt='.2f', linewidths=0.5)
```

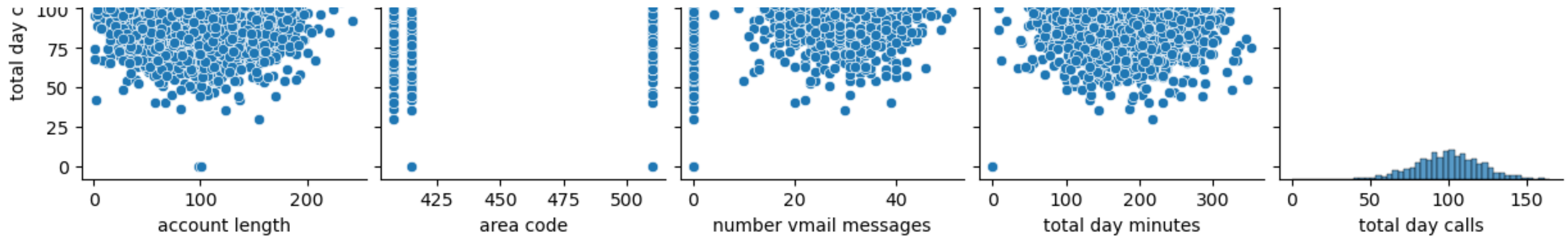
```
plt.title('Correlation Heatmap')
plt.show()
```


Correlation Heatmap
account length
area code
number vmail messages
total day minutes
total day calls
total day charge
total eve minutes
total eve calls
total eve charge
total night minutes
total night calls
total night charge
total intl minutes
total intl calls
total intl charge
customer service calls

Pairplot

In [53]:
```
# Pairplot for a subset of numeric columns (to avoid clutter)
sns.pairplot(df[numeric_columns[:5]])  # Visualize first 5 numeric columns
plt.show()
```


account length
area code
number vmail messages
total day minutes
alls
250
200
150
100
50
0
500
480
460
440
420
40
30
20
10
350
300
125

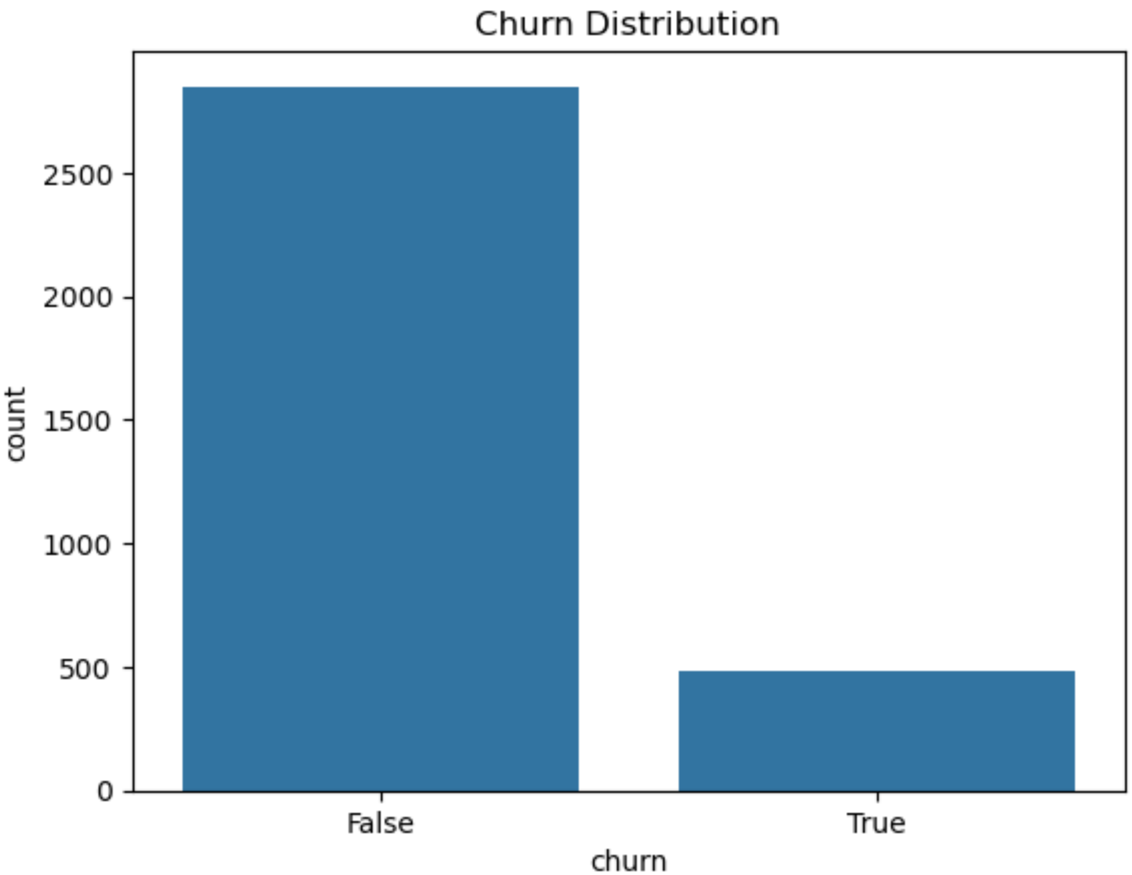



Target Variable Analysis: Churn

Churn Distribution

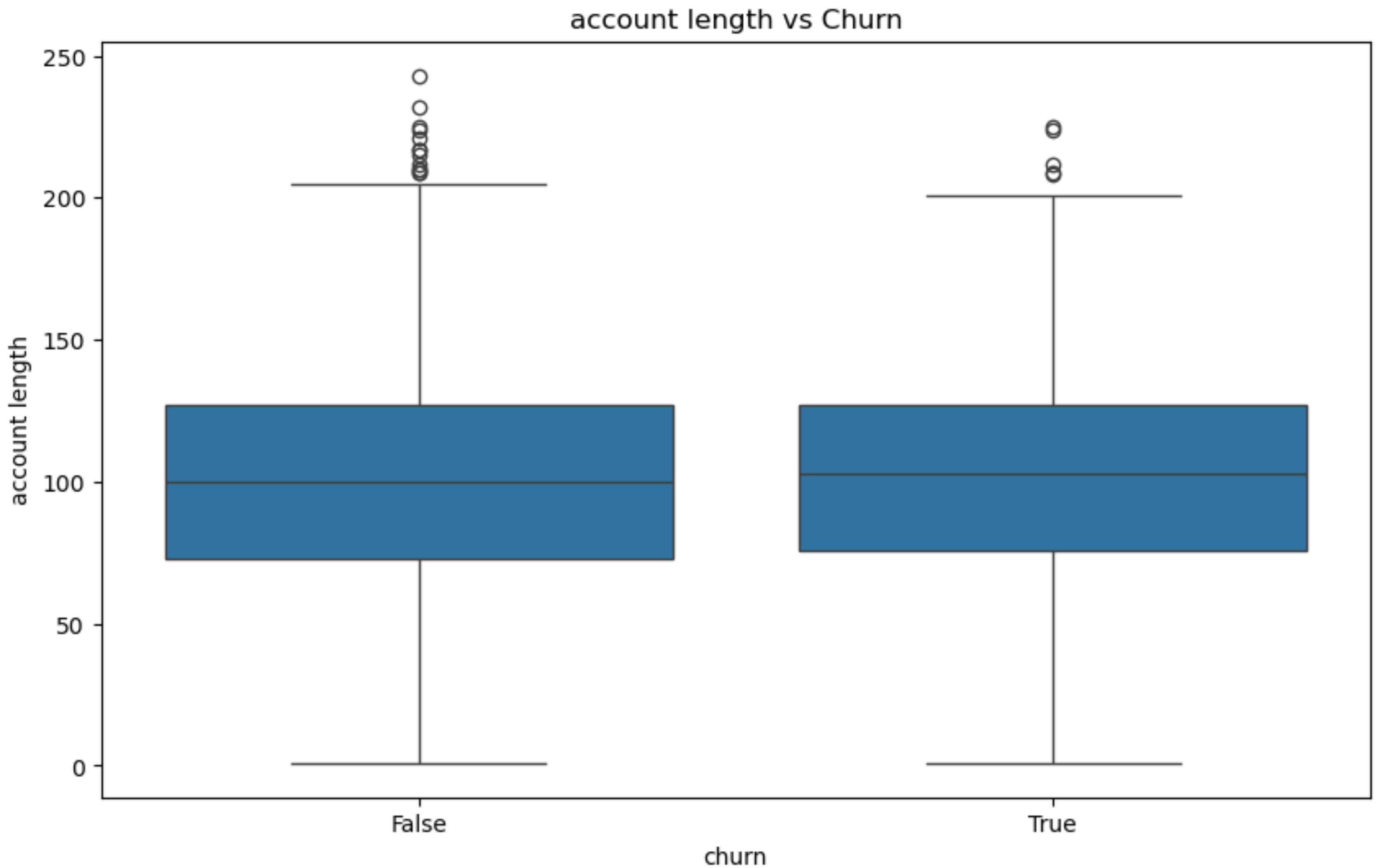
In [54]:

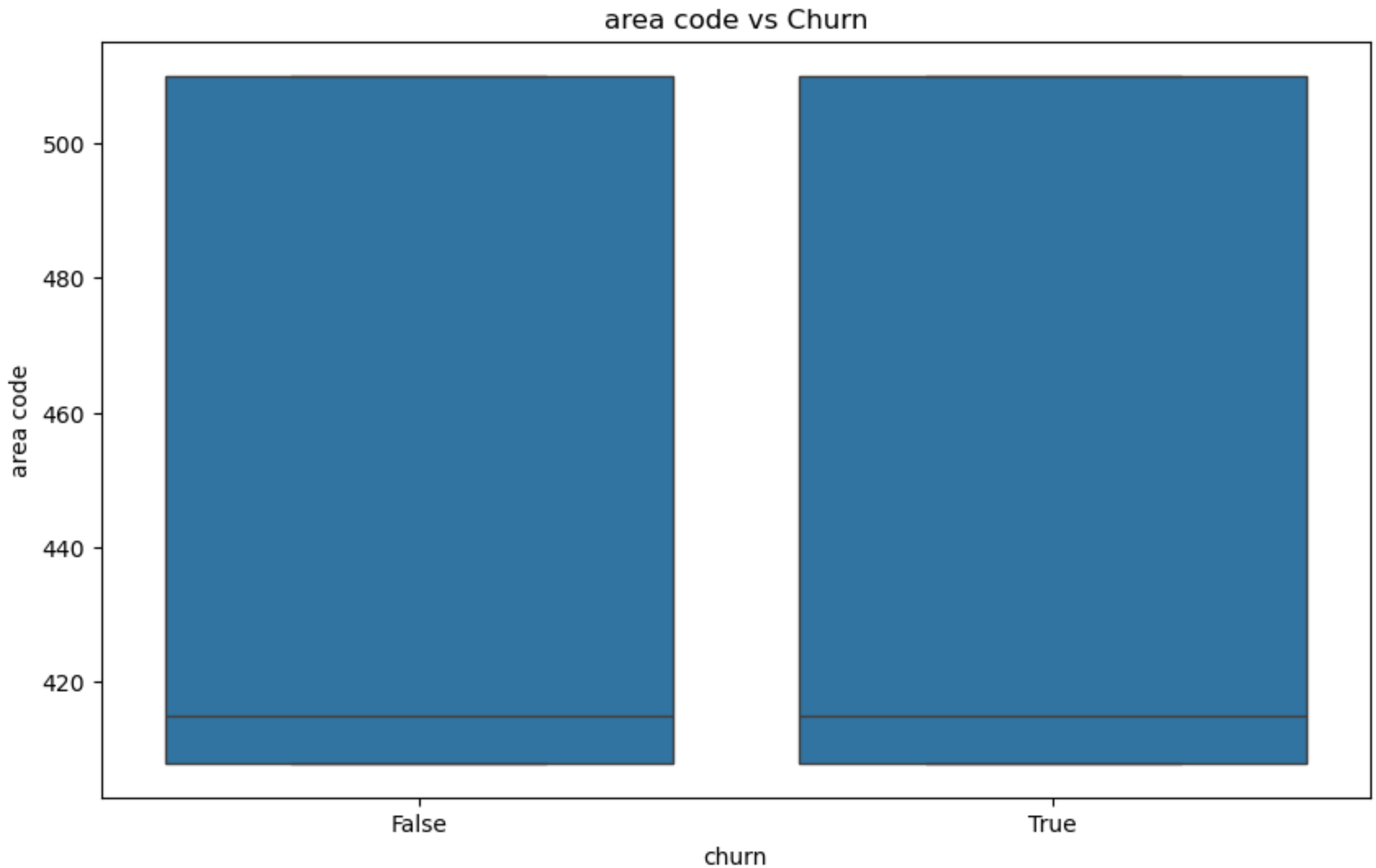
```
# Plot churn distribution
sns.countplot(data=df, x='churn')
plt.title('Churn Distribution')
plt.show()
```

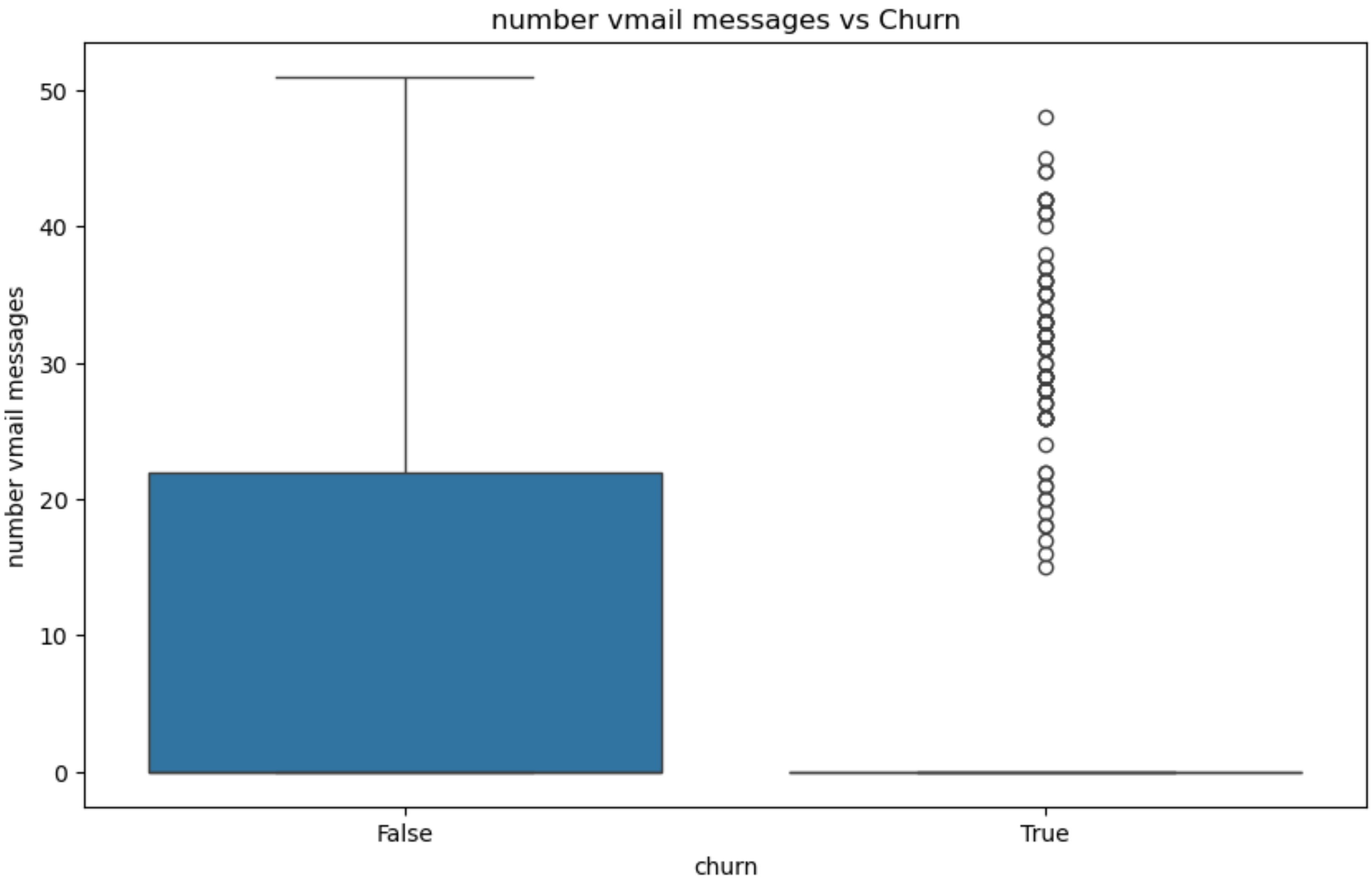


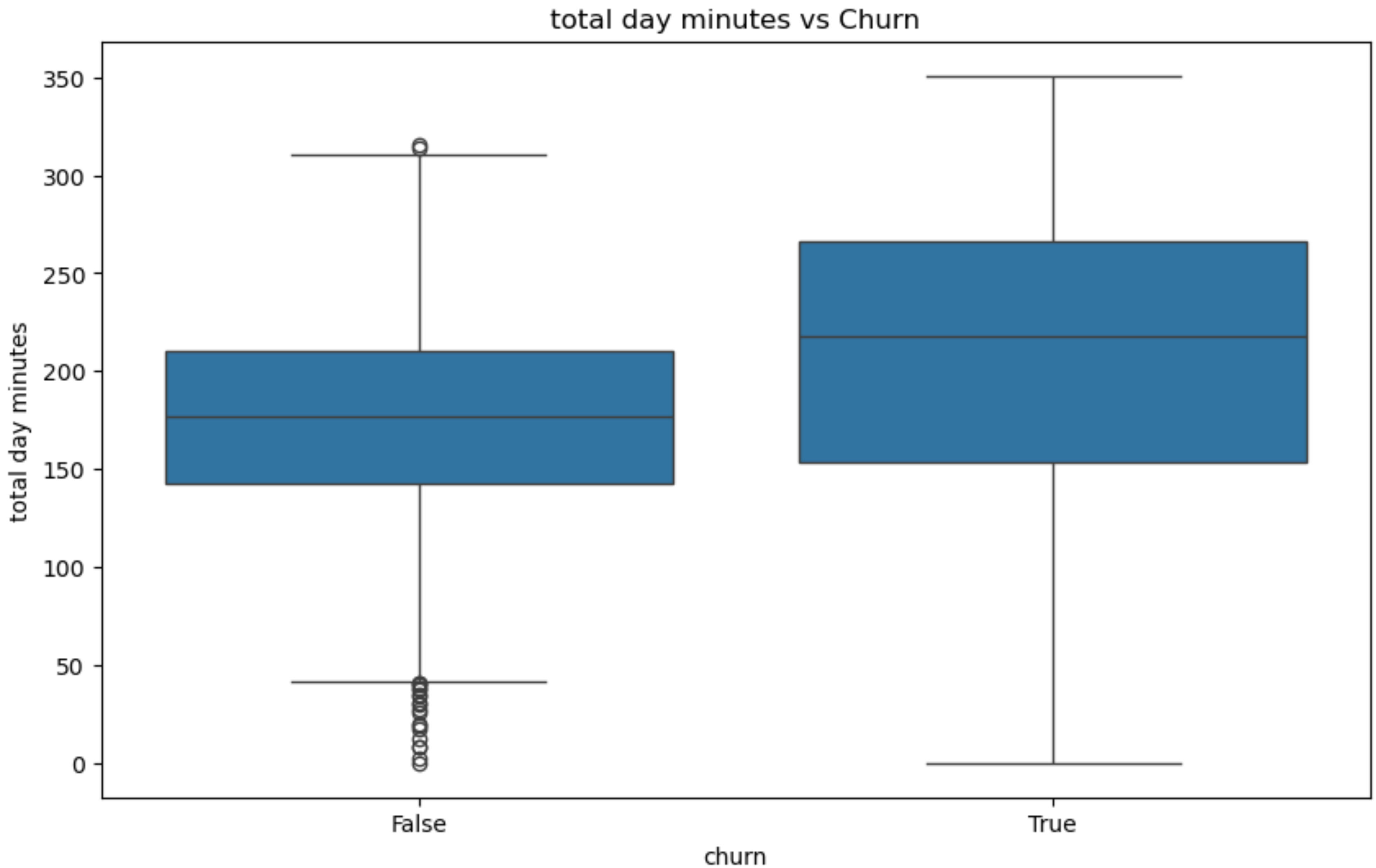

Churn vs Other Variables

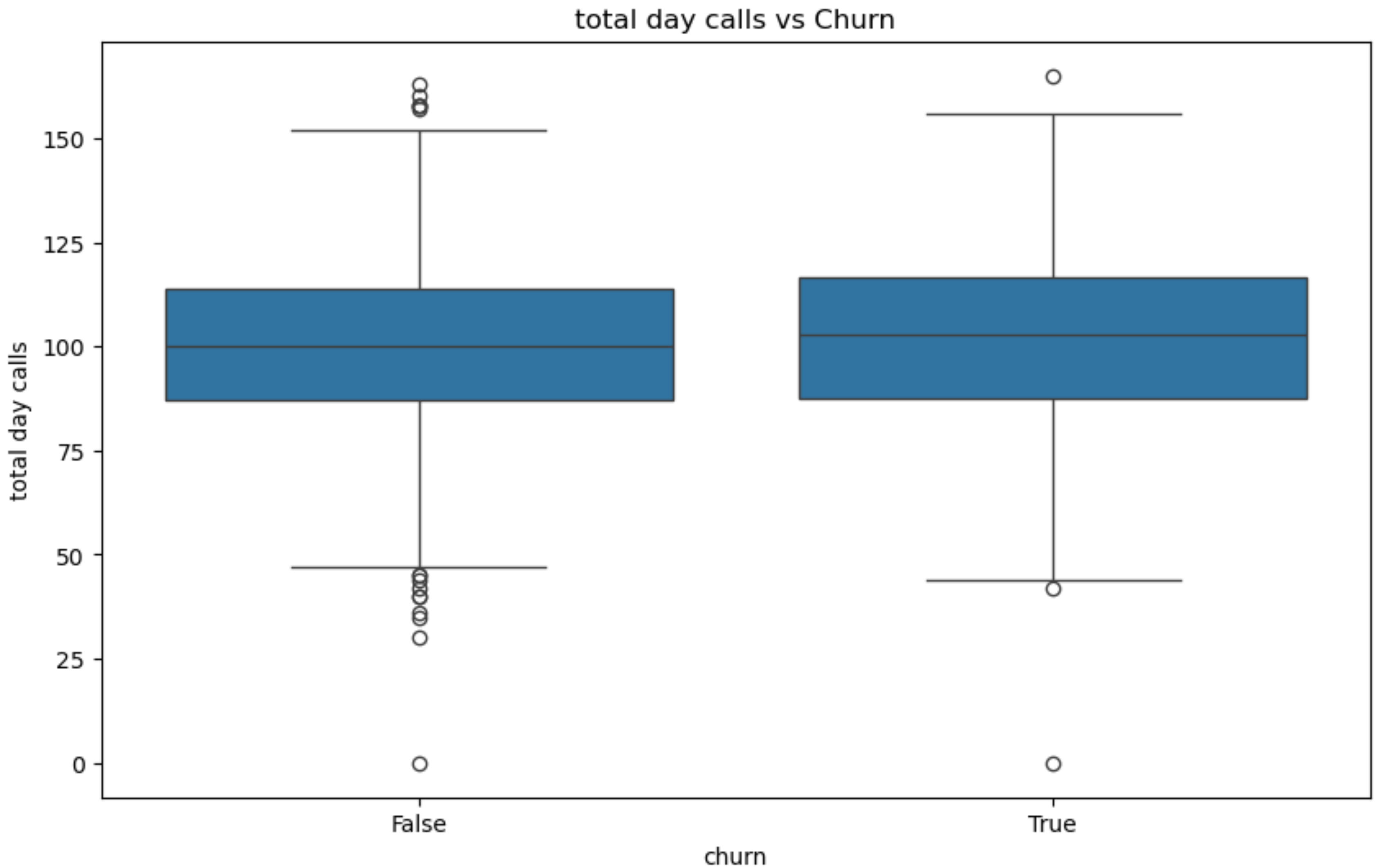
In [55]:
```
# Boxplot for numeric variable vs churn
for column in numeric_columns:
    plt.figure(figsize=(10, 6))
    sns.boxplot(data=df, x='churn', y=column)
    plt.title(f'{column} vs Churn')
    plt.show()
```

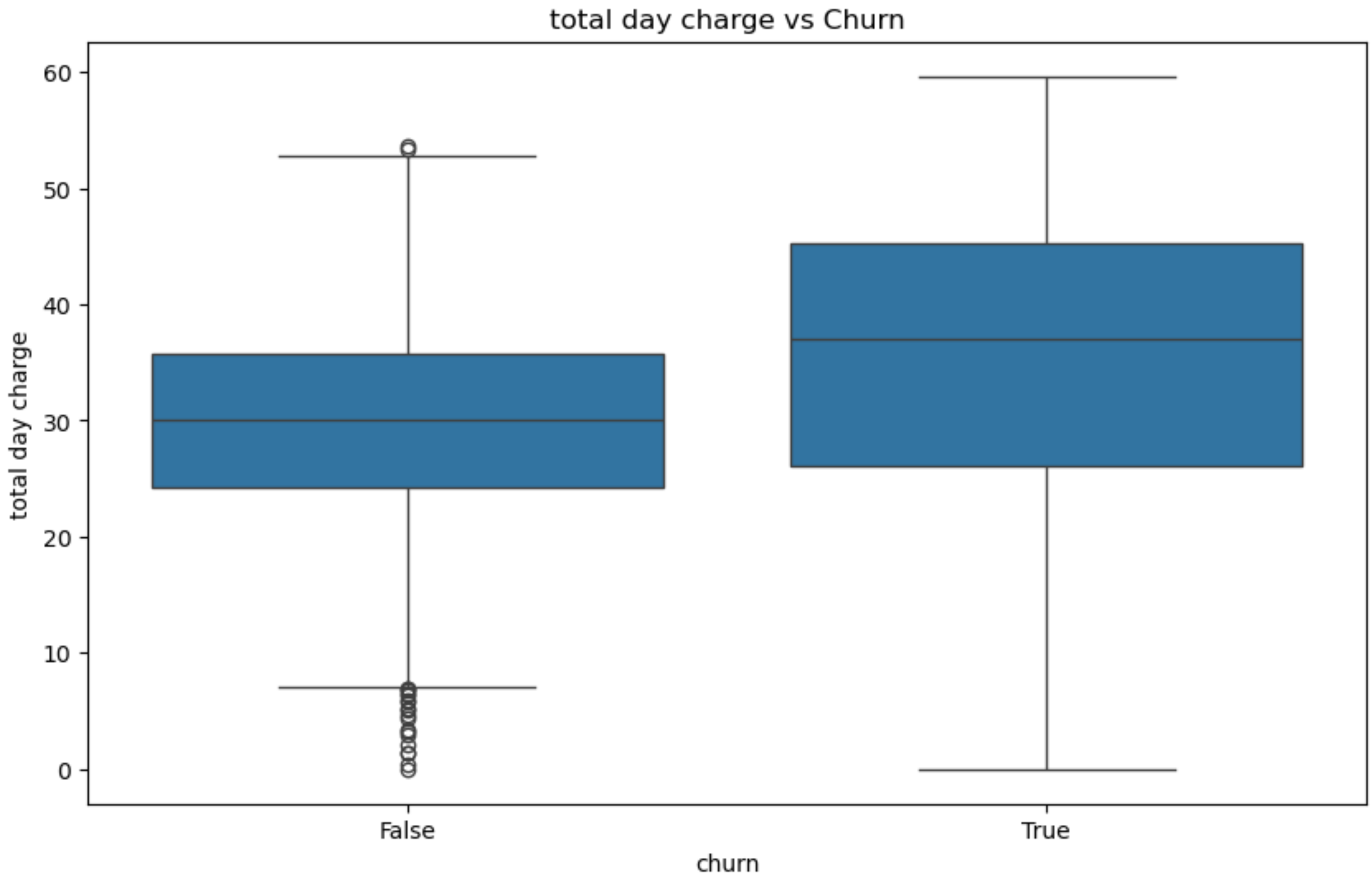

account length vs Churn
account length
250
200
150
100
50
0
False
True
churn

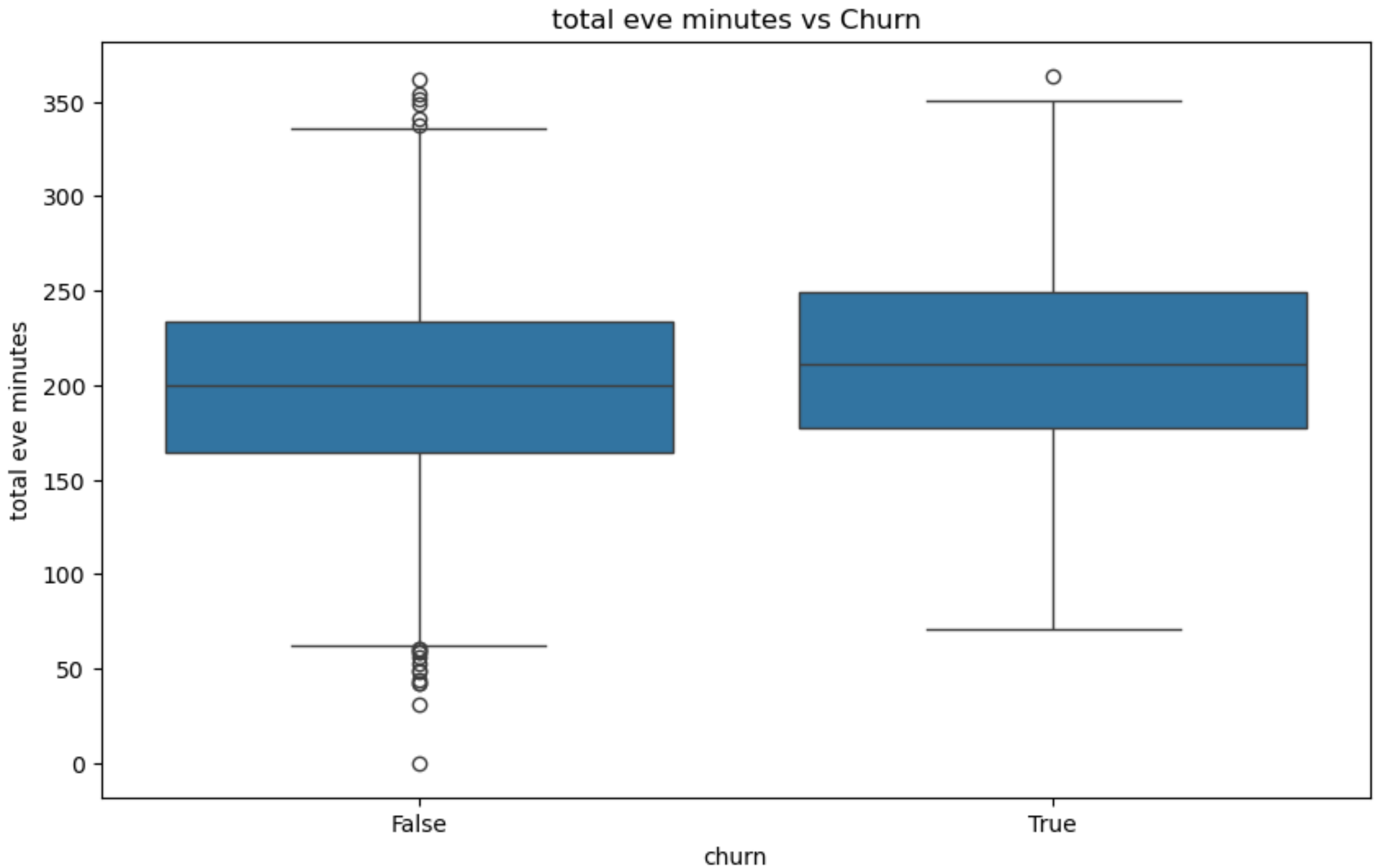

area code vs Churn
area code
500
480
460
440
420
False
True
churn

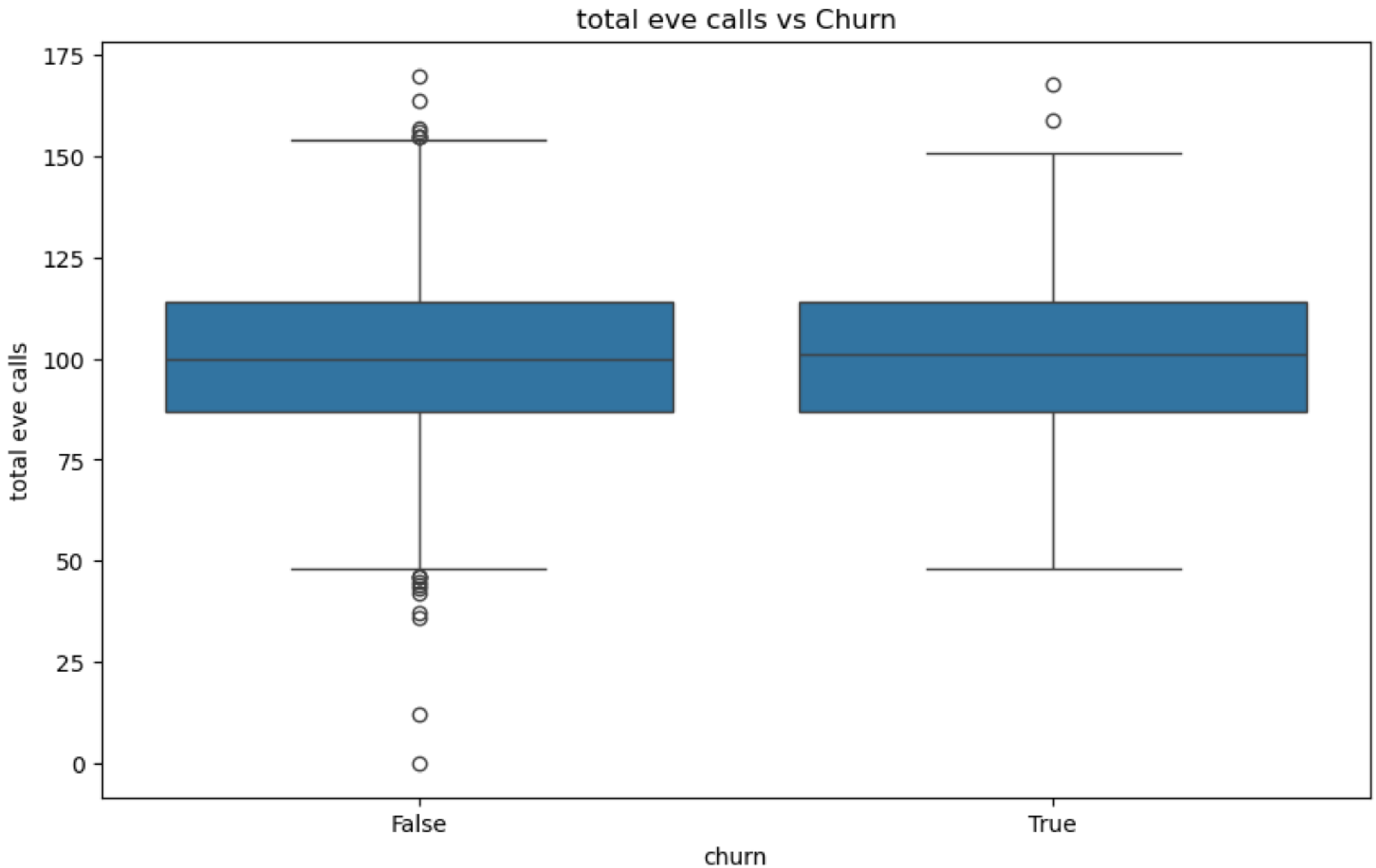

number vmail messages vs Churn
number vmail messages
0
10
20
30
40
50
False
True
churn

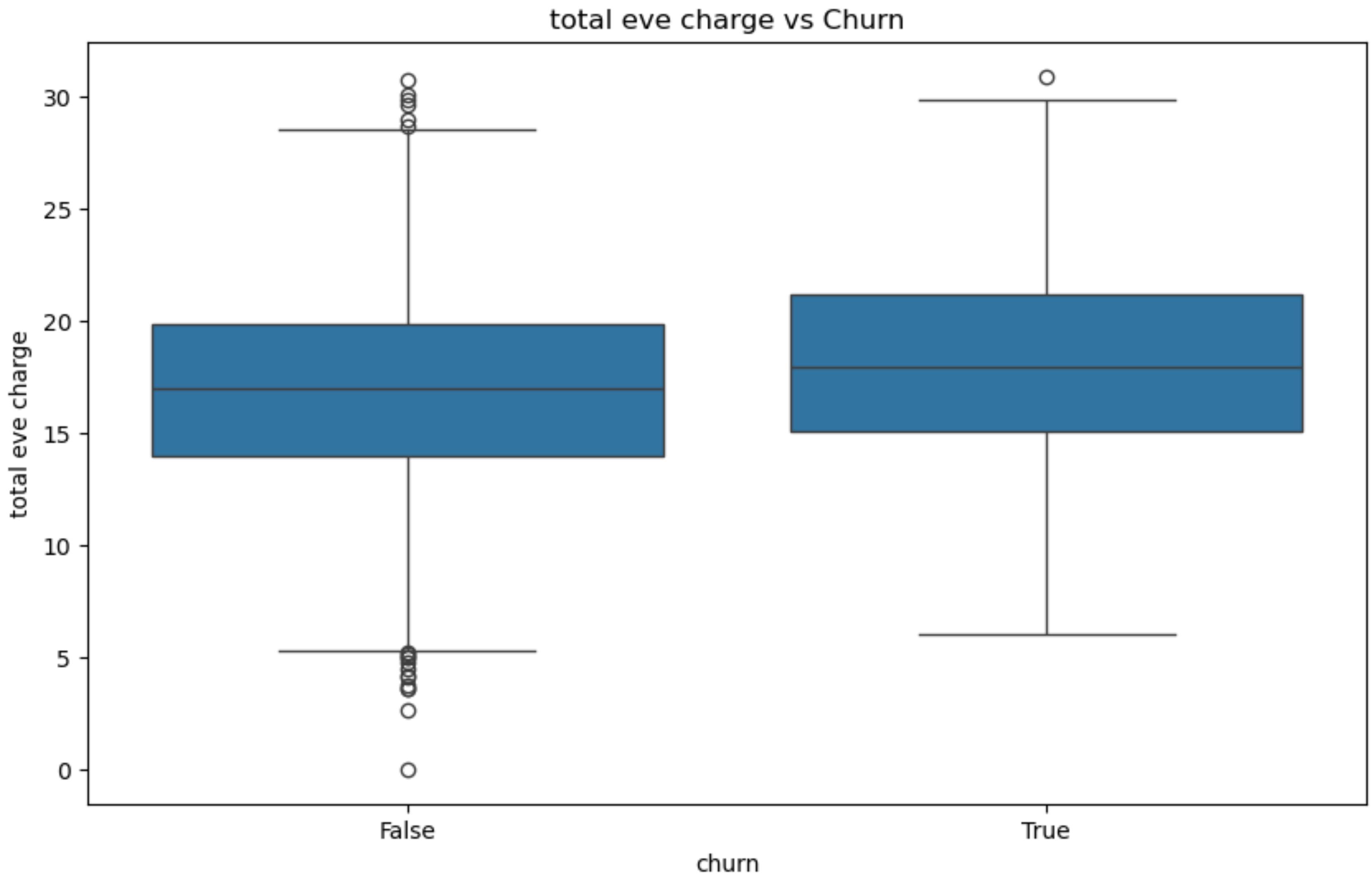

total day minutes vs Churn
total day minutes
350
300
250
200
150
100
50
0
False
True
churn

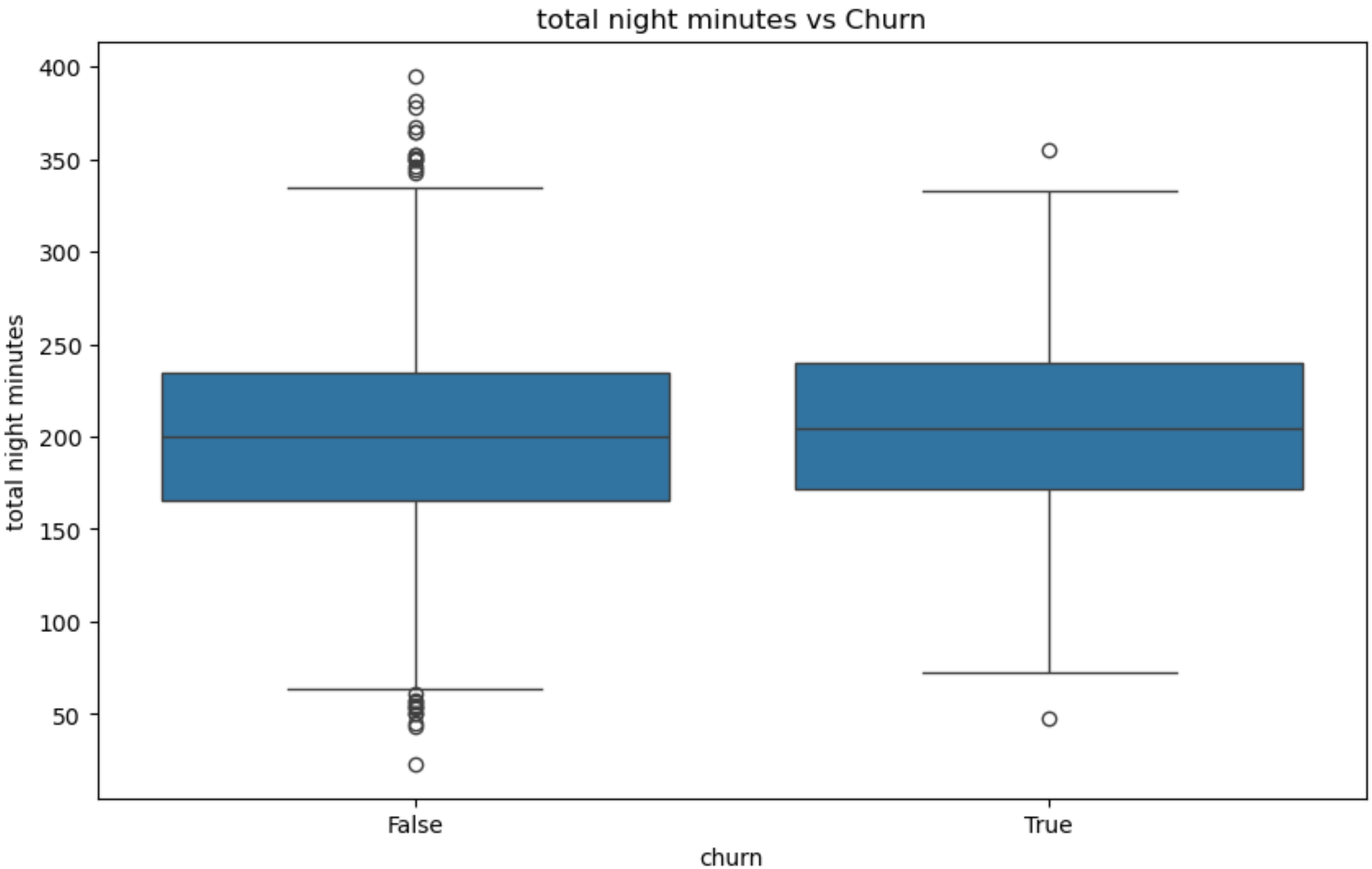

total day calls vs Churn
total day calls
150
125
100
75
50
25
0
False
True
churn

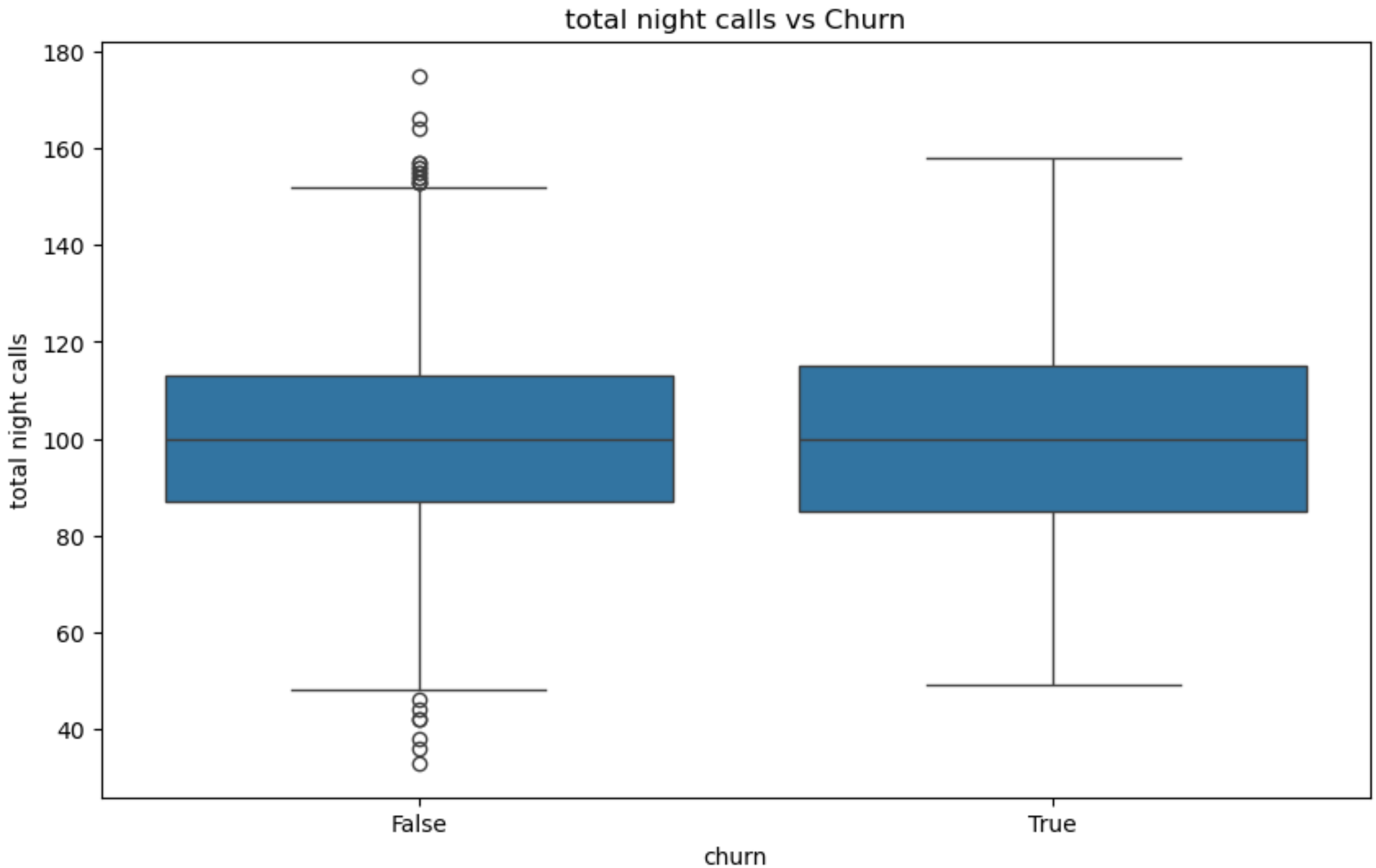

total day charge vs Churn
60
50
40
30
20
10
0
total day charge
False
True
churn

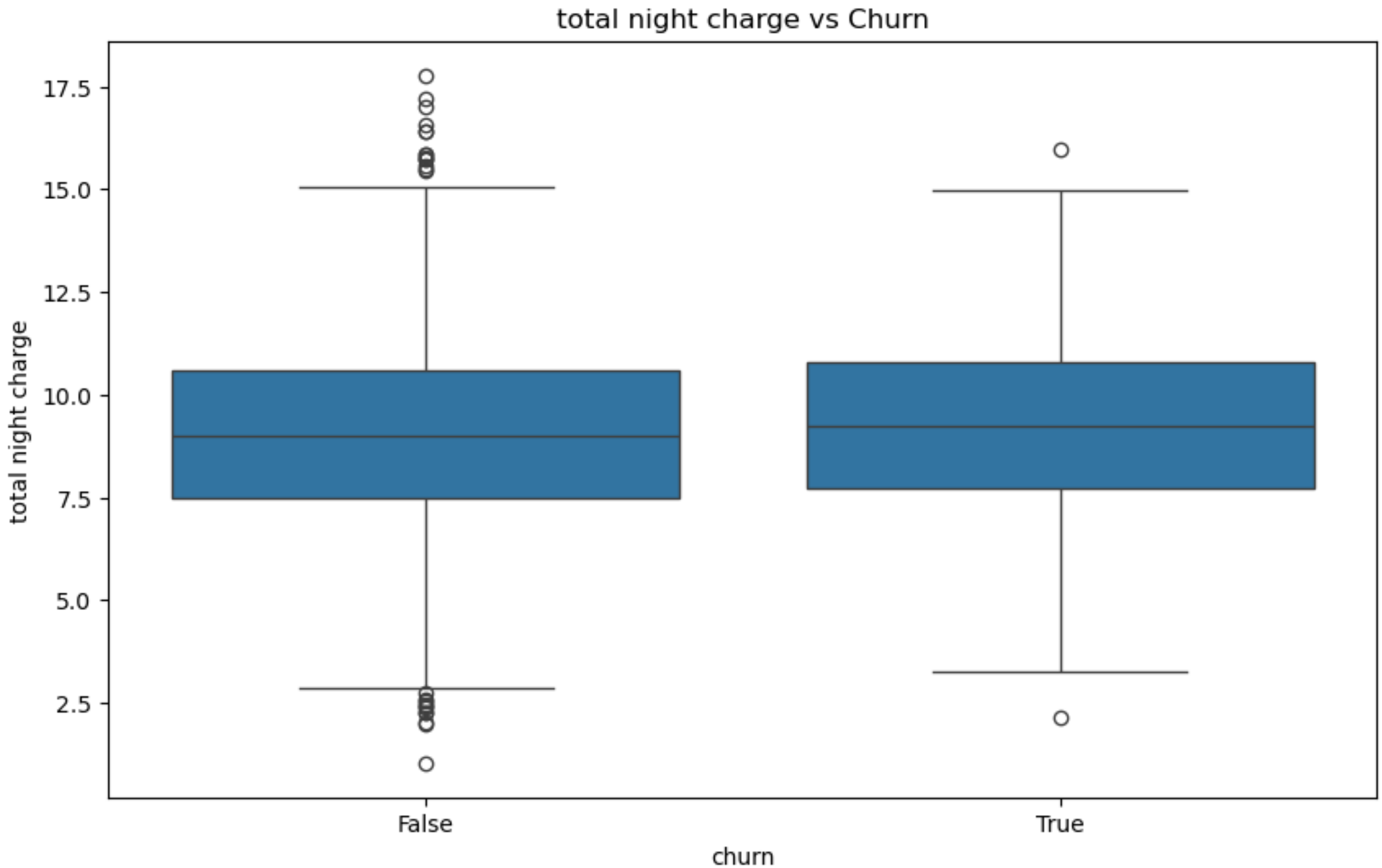

total eve minutes vs Churn
total eve minutes
350
300
250
200
150
100
50
0
False
True
churn

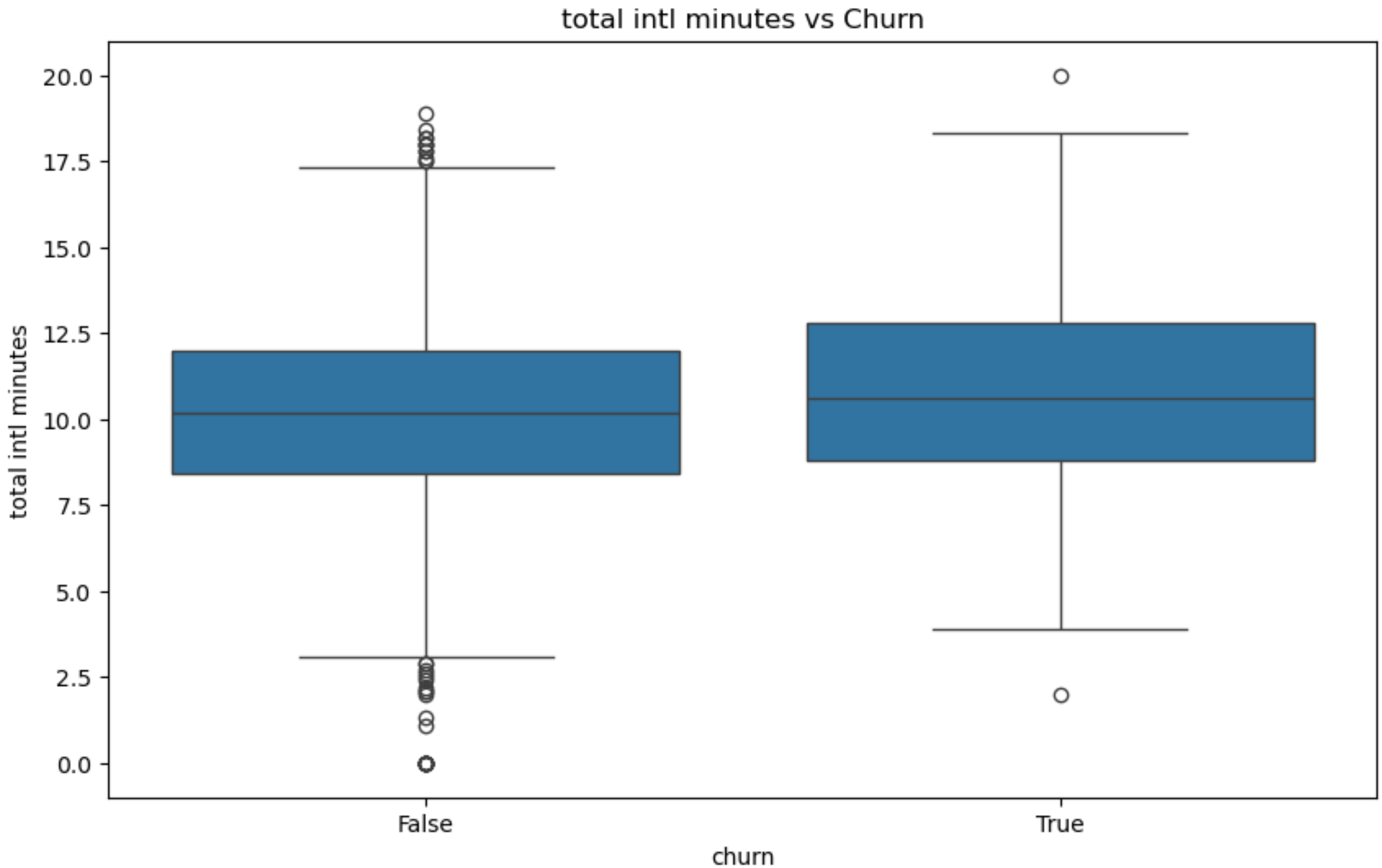

total eve calls vs Churn
175
150
125
100
75
50
25
0
total eve calls
False
True
churn

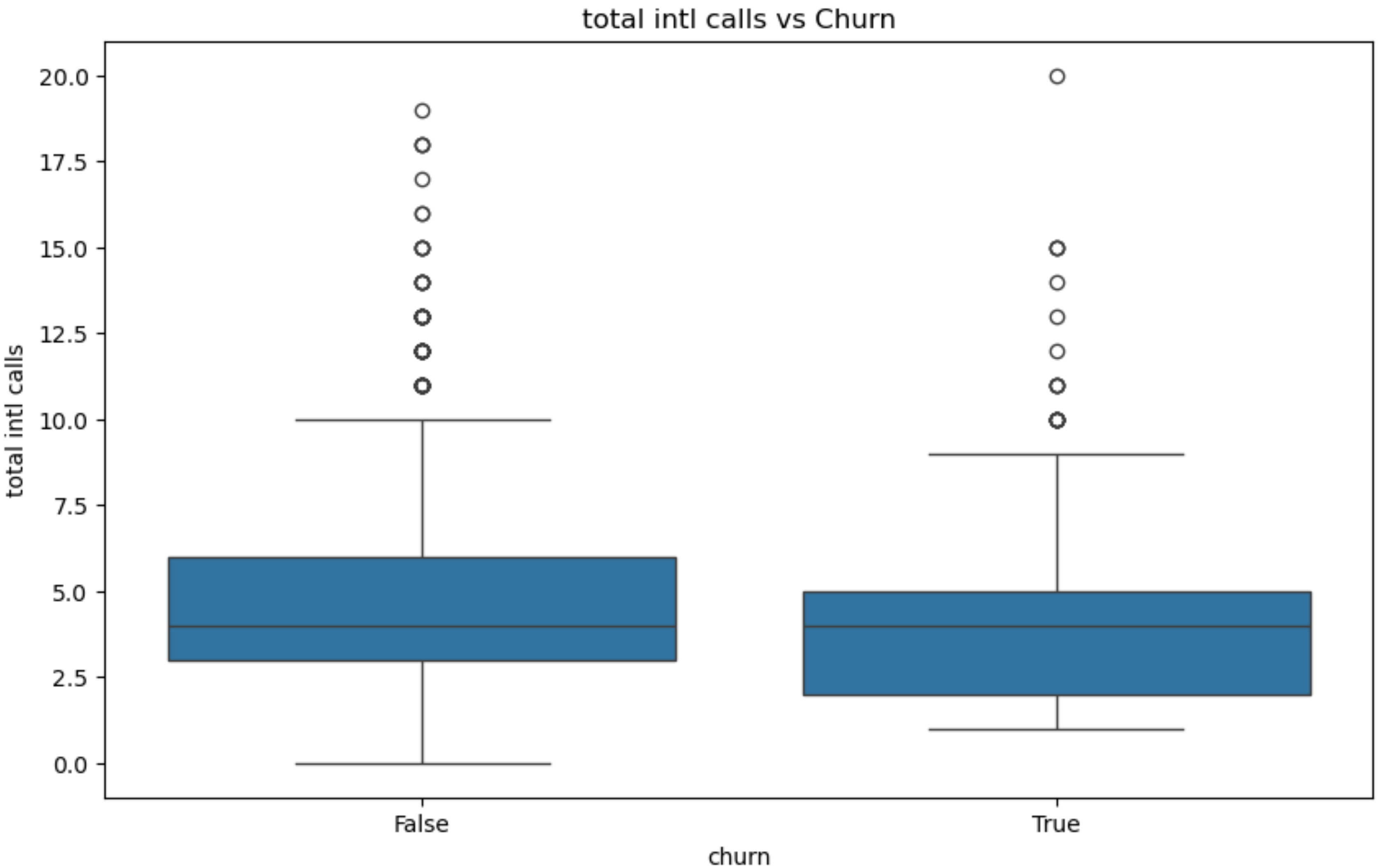

total eve charge vs Churn
total eve charge
30
25
20
15
10
5
0
False
True
churn

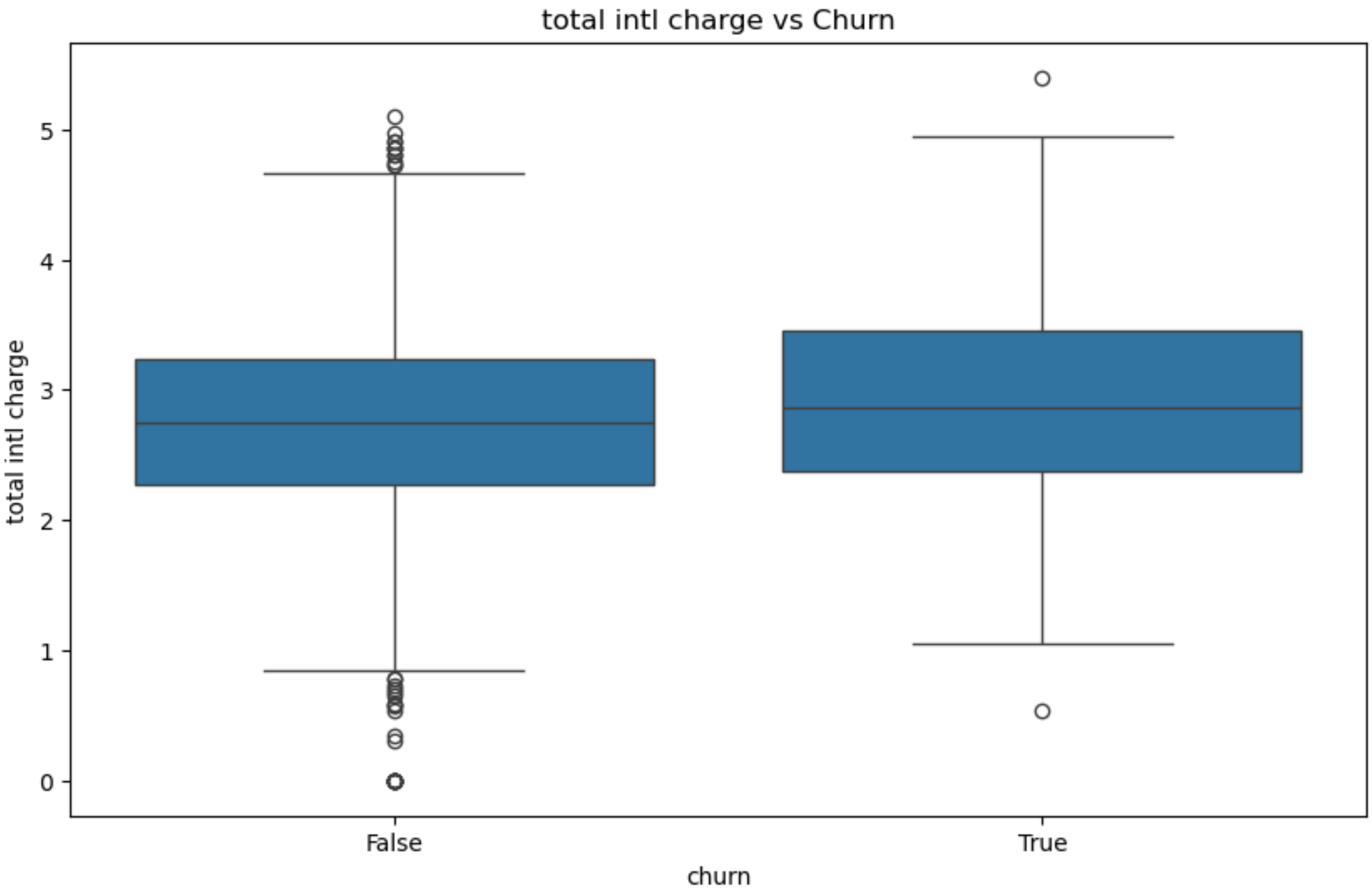

total night minutes vs Churn
400
350
300
250
200
150
100
50
total night minutes
False
True
churn

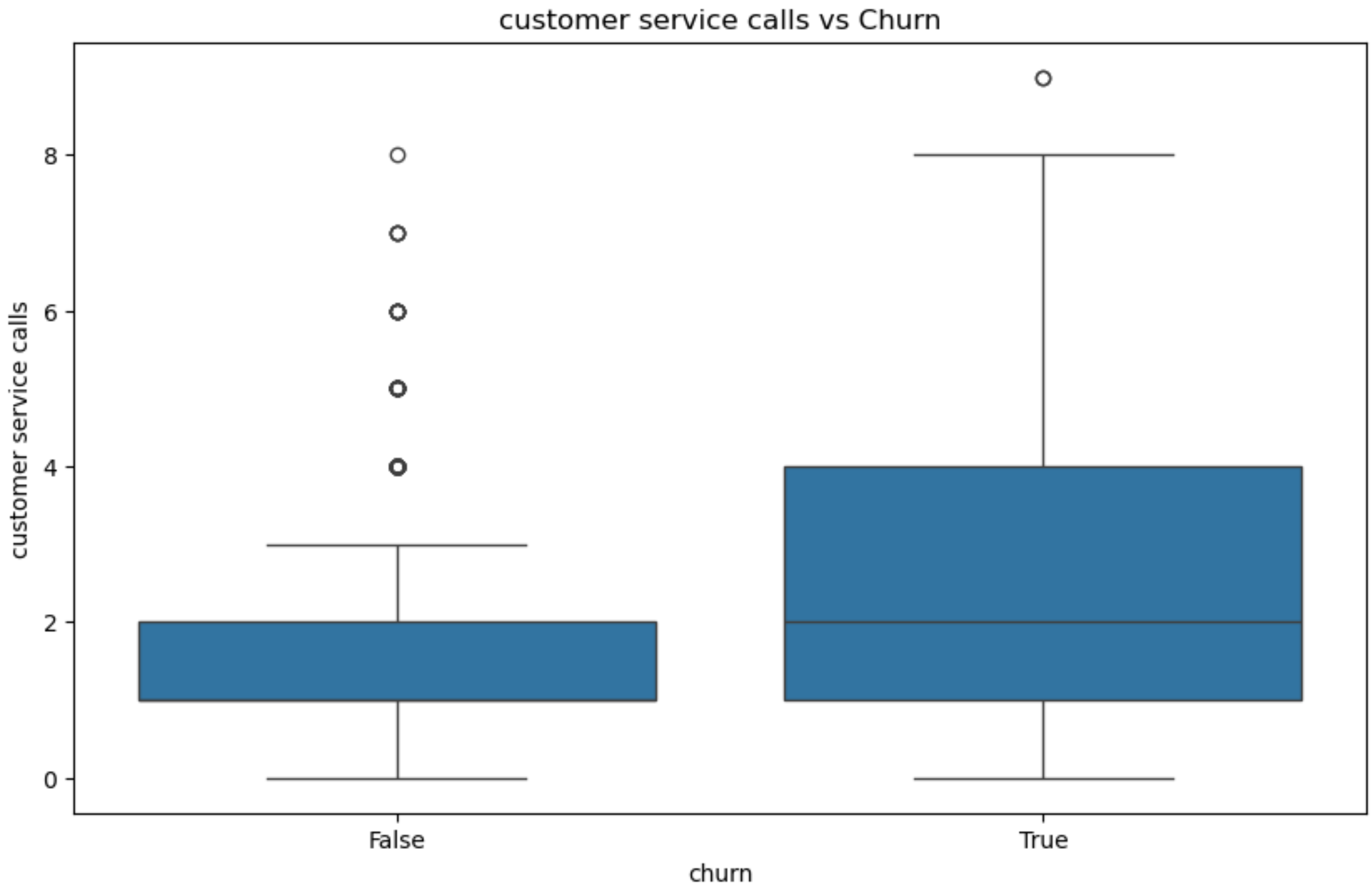

total night calls vs Churn
180
160
140
120
100
80
60
40
total night calls
False
True
churn


total night charge vs Churn
17.5
15.0
12.5
10.0
7.5
5.0
2.5
total night charge
False
True
churn


total intl minutes vs Churn
total intl minutes
20.0
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
False
True
churn


total intl calls vs Churn
total intl calls
20.0
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
False
True
churn


total intl charge vs Churn
total intl charge
0
1
2
3
4
5
False
True
churn




Feature Engineering

In [56]:
```
df['total_usage_minutes'] = df['total day minutes'] + df['total eve minutes'] + df['total night minutes'] + df['total
df['total_charges'] = df['total day charge'] + df['total eve charge'] + df['total night charge'] + df['total intl cha
```

PROCESSING

Handle Missing Data

In [57]:
```
# Check for missing values
missing_data = df.isnull().sum()
print(missing_data)

# Drop rows with missing values
df = df.dropna()

# Fill missing values with a constant value
df.fillna(0, inplace=True)
```

```
state                     0
account length            0
area code                 0
phone number              0
international plan        0
voice mail plan           0
number vmail messages     0
total day minutes         0
total day calls           0
total day charge          0
total eve minutes         0
total eve calls           0
total eve charge          0
total night minutes       0
total night calls         0
total night charge        0
total intl minutes        0
total intl calls          0
total intl charge         0
customer service calls    0
churn                     0
total_usage_minutes       0
total_charges             0
dtype: int64
```

Label Encoding for Binary Categories

In [58]:
```
# Perform one-hot encoding for categorical variables
df = pd.get_dummies(df, columns=['state', 'international plan', 'voice mail plan'], drop_first=True)
```

Feature Scaling

Standardization (Z-Score Normalization)

In [59]:
```
from sklearn.preprocessing import StandardScaler

# Select numeric columns
numeric_columns = df.select_dtypes(include=['float64', 'int64']).columns

# Initialize the scaler
scaler = StandardScaler()

# Standardize numeric columns
df[numeric_columns] = scaler.fit_transform(df[numeric_columns])
```

Min-Max Scaling

In [60]:
```
from sklearn.preprocessing import MinMaxScaler

# Min-max scaling
scaler = MinMaxScaler()
df[numeric_columns] = scaler.fit_transform(df[numeric_columns])
```

Feature Engineering

Total Usage Minutes and Total Charges

In [61]:
```
# Feature engineering for Total usage time and total charges
df['total_usage_minutes'] = df['total day minutes'] + df['total eve minutes'] + df['total night minutes'] + df['total
df['total_charges'] = df['total day charge'] + df['total eve charge'] + df['total night charge'] + df['total intl cha
```

Dropping Irrelevant Features

In [62]:
```
# Drop irrelevant features ( 'phone number', 'area code')
df.drop(columns=['phone number', 'area code'], inplace=True)
```

Splitting Data into Features and Target

In [64]:
```
# Features (X) and target variable (y)
X = df.drop('churn', axis=1)
y = df['churn']
```

Train-Test Split

In [65]:
```
from sklearn.model_selection import train_test_split

# Train-test split (80% train, 20% test)
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)
```

Modeling

Train the Models

Logistic Regression

In [66]:
```
# Initialize the Logistic Regression model
logreg = LogisticRegression(random_state=42)

# Train the model
logreg.fit(X_train, y_train)

# Make predictions
y_pred_logreg = logreg.predict(X_test)

# Evaluate performance
accuracy_logreg = accuracy_score(y_test, y_pred_logreg)
precision_logreg = precision_score(y_test, y_pred_logreg)
recall_logreg = recall_score(y_test, y_pred_logreg)
f1_logreg = f1_score(y_test, y_pred_logreg)
roc_auc_logreg = roc_auc_score(y_test, y_pred_logreg)

print(f'Logistic Regression - Accuracy: {accuracy_logreg:.4f}, Precision: {precision_logreg:.4f}, Recall: {recall_log
```

```
Logistic Regression - Accuracy: 0.8576, Precision: 0.5938, Recall: 0.1881, F1-score: 0.2857, ROC AUC: 0.5826
```

Random Forest Classifier

In [67]:
```
# Initialize the Random Forest model
rf = RandomForestClassifier(random_state=42)

# Train the model
rf.fit(X_train, y_train)

# Make predictions
y_pred_rf = rf.predict(X_test)

# Evaluate performance
accuracy_rf = accuracy_score(y_test, y_pred_rf)
precision_rf = precision_score(y_test, y_pred_rf)
recall_rf = recall_score(y_test, y_pred_rf)
f1_rf = f1_score(y_test, y_pred_rf)
roc_auc_rf = roc_auc_score(y_test, y_pred_rf)

print(f'Random Forest - Accuracy: {accuracy_rf:.4f}, Precision: {precision_rf:.4f}, Recall: {recall_rf:.4f}, F1-score
```

```
Random Forest - Accuracy: 0.9370, Precision: 0.9836, Recall: 0.5941, F1-score: 0.7407, ROC AUC: 0.7961
```

Support Vector Machine (SVM)

In [68]:
```
# Initialize the SVM model
svm = SVC(probability=True, random_state=42)

# Train the model
svm.fit(X_train, y_train)

# Make predictions
y_pred_svm = svm.predict(X_test)

# Evaluate performance
accuracy_svm = accuracy_score(y_test, y_pred_svm)
precision_svm = precision_score(y_test, y_pred_svm)
recall_svm = recall_score(y_test, y_pred_svm)
f1_svm = f1_score(y_test, y_pred_svm)
roc_auc_svm = roc_auc_score(y_test, y_pred_svm)

print(f'SVM - Accuracy: {accuracy_svm:.4f}, Precision: {precision_svm:.4f}, Recall: {recall_svm:.4f}, F1-score: {f1_s
```

```
SVM - Accuracy: 0.8486, Precision: 0.0000, Recall: 0.0000, F1-score: 0.0000, ROC AUC: 0.5000
```

Compare the Models

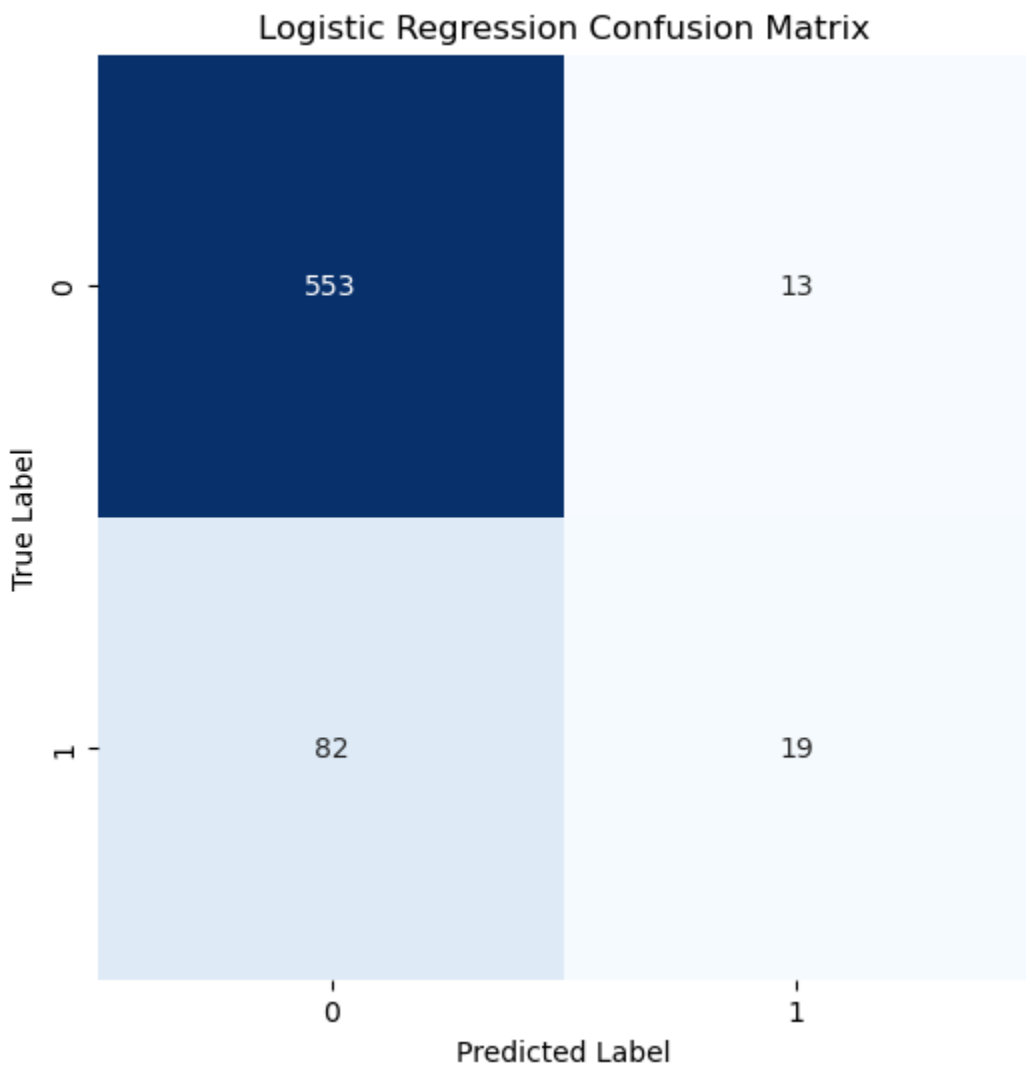
In [69]:
```
# Create a comparison table
model_comparison = {
    'Model': ['Logistic Regression', 'Random Forest', 'SVM'],
    'Accuracy': [accuracy_logreg, accuracy_rf, accuracy_svm],
    'Precision': [precision_logreg, precision_rf, precision_svm],
    'Recall': [recall_logreg, recall_rf, recall_svm],
    'F1-score': [f1_logreg, f1_rf, f1_svm],
    'ROC AUC': [roc_auc_logreg, roc_auc_rf, roc_auc_svm]
}

comparison_df = pd.DataFrame(model_comparison)
print(comparison_df)
```

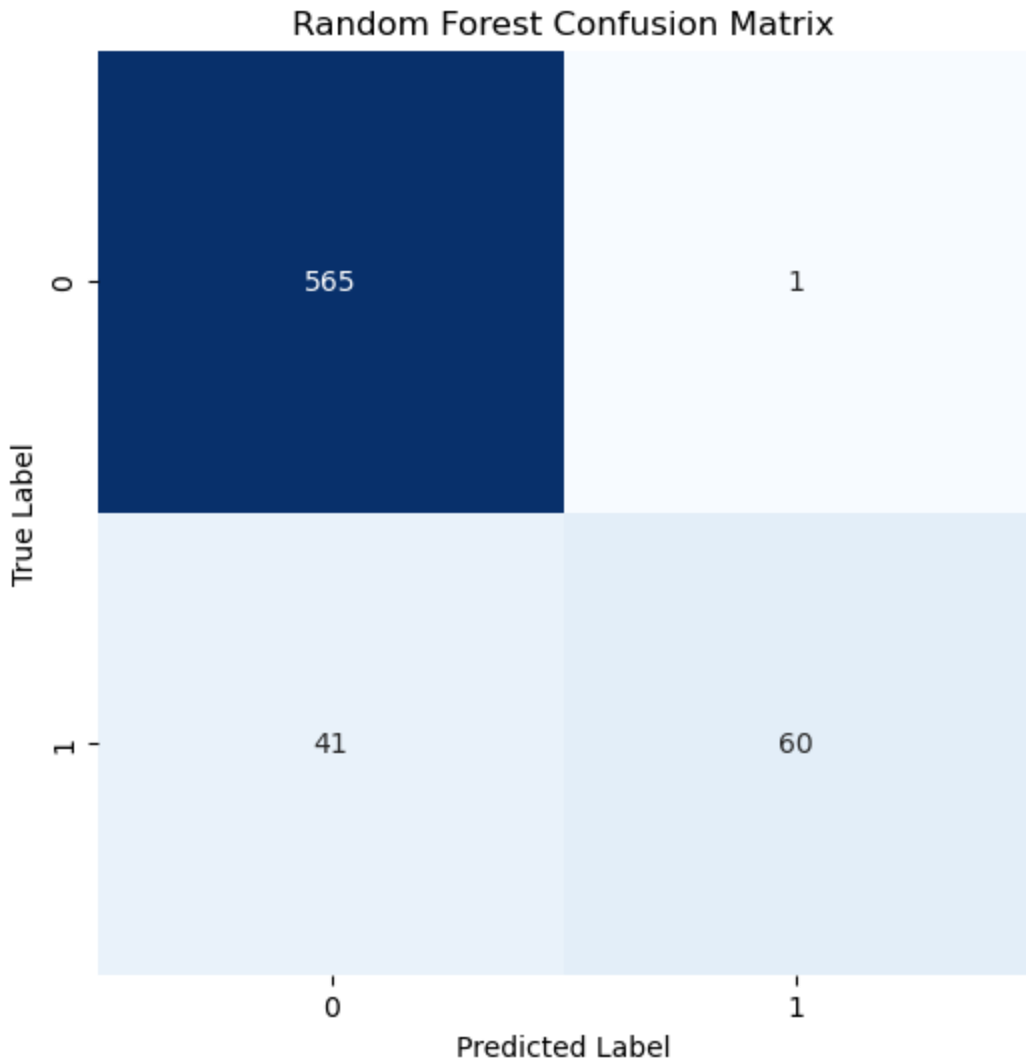
```
                 Model  Accuracy  Precision    Recall  F1-score   ROC AUC
0  Logistic Regression  0.857571   0.593750  0.188119  0.285714  0.582575
1        Random Forest  0.937031   0.983607  0.594059  0.740741  0.796146
2                  SVM  0.848576   0.000000  0.000000  0.000000  0.500000
```

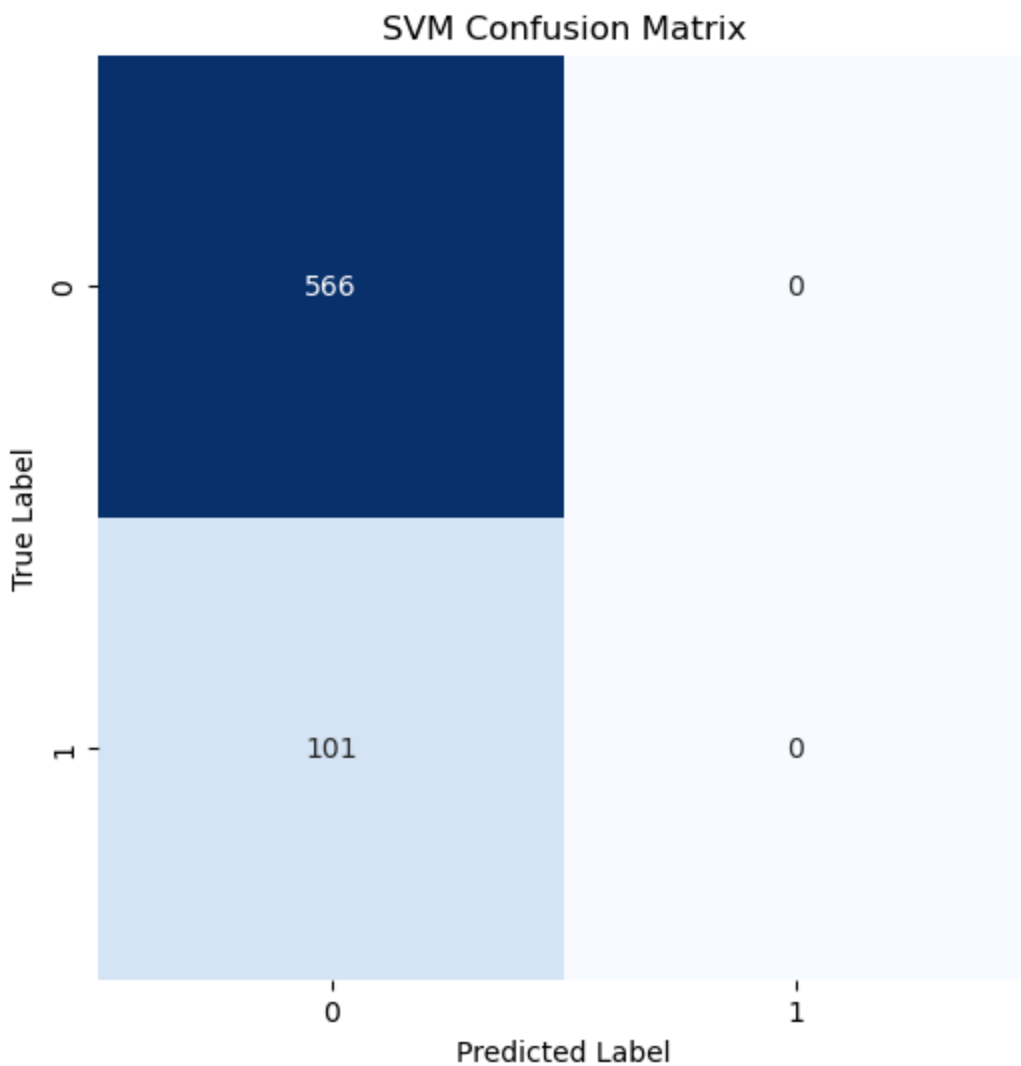
Confusion Matrix

In [70]:
```
# Confusion Matrix for Logistic Regression
plt.figure(figsize=(6, 6))
sns.heatmap(confusion_matrix(y_test, y_pred_logreg), annot=True, fmt='d', cmap='Blues', cbar=False)
plt.title('Logistic Regression Confusion Matrix')
plt.ylabel('True Label')
plt.xlabel('Predicted Label')
plt.show()

# Confusion Matrix for Random Forest
plt.figure(figsize=(6, 6))
sns.heatmap(confusion_matrix(y_test, y_pred_rf), annot=True, fmt='d', cmap='Blues', cbar=False)
plt.title('Random Forest Confusion Matrix')
plt.ylabel('True Label')
plt.xlabel('Predicted Label')
plt.show()

# Confusion Matrix for SVM
plt.figure(figsize=(6, 6))
```

```
sns.heatmap(confusion_matrix(y_test, y_pred_svm), annot=True, fmt='d', cmap='Blues', cbar=False)
plt.title('SVM Confusion Matrix')
plt.ylabel('True Label')
plt.xlabel('Predicted Label')
plt.show()
```




Random Forest Confusion Matrix
565
1
41
60
0
1
True Label
0
1
Predicted Label




Evaluating the Models

Logistic Regression Evaluation

In [71]:
```
from sklearn.metrics import accuracy_score, precision_score, recall_score, f1_score, roc_auc_score, confusion_matrix

# Evaluate Logistic Regression
accuracy_logreg = accuracy_score(y_test, y_pred_logreg)
```

```
precision_logreg = precision_score(y_test, y_pred_logreg)
recall_logreg = recall_score(y_test, y_pred_logreg)
f1_logreg = f1_score(y_test, y_pred_logreg)
roc_auc_logreg = roc_auc_score(y_test, y_pred_logreg)

# Display the evaluation metrics for Logistic Regression
print(f'Logistic Regression - Accuracy: {accuracy_logreg:.4f}')
print(f'Precision: {precision_logreg:.4f}')
print(f'Recall: {recall_logreg:.4f}')
print(f'F1-score: {f1_logreg:.4f}')
print(f'ROC AUC: {roc_auc_logreg:.4f}')

# Confusion Matrix
conf_matrix_logreg = confusion_matrix(y_test, y_pred_logreg)
print(f'Confusion Matrix for Logistic Regression:\n{conf_matrix_logreg}')
```

```
Logistic Regression - Accuracy: 0.8576
Precision: 0.5938
Recall: 0.1881
F1-score: 0.2857
ROC AUC: 0.5826
Confusion Matrix for Logistic Regression:
[[553  13]
 [ 82  19]]
```

Random Forest Evaluation

In [72]:
```
# Evaluate Random Forest
accuracy_rf = accuracy_score(y_test, y_pred_rf)
precision_rf = precision_score(y_test, y_pred_rf)
recall_rf = recall_score(y_test, y_pred_rf)
f1_rf = f1_score(y_test, y_pred_rf)
roc_auc_rf = roc_auc_score(y_test, y_pred_rf)

# Display the evaluation metrics for Random Forest
print(f'\nRandom Forest - Accuracy: {accuracy_rf:.4f}')
print(f'Precision: {precision_rf:.4f}')
print(f'Recall: {recall_rf:.4f}')
print(f'F1-score: {f1_rf:.4f}')
print(f'ROC AUC: {roc_auc_rf:.4f}')

# Confusion Matrix
```

```
conf_matrix_rf = confusion_matrix(y_test, y_pred_rf)
print(f'Confusion Matrix for Random Forest:\n{conf_matrix_rf}')
```

```
Random Forest - Accuracy: 0.9370
Precision: 0.9836
Recall: 0.5941
F1-score: 0.7407
ROC AUC: 0.7961
Confusion Matrix for Random Forest:
[[565   1]
 [ 41  60]]
```

SVM Evaluation

In [73]:

```
# Evaluate SVM
accuracy_svm = accuracy_score(y_test, y_pred_svm)
precision_svm = precision_score(y_test, y_pred_svm)
recall_svm = recall_score(y_test, y_pred_svm)
f1_svm = f1_score(y_test, y_pred_svm)
roc_auc_svm = roc_auc_score(y_test, y_pred_svm)

# Display the evaluation metrics for SVM
print(f'\nSVM - Accuracy: {accuracy_svm:.4f}')
print(f'Precision: {precision_svm:.4f}')
print(f'Recall: {recall_svm:.4f}')
print(f'F1-score: {f1_svm:.4f}')
print(f'ROC AUC: {roc_auc_svm:.4f}')

# Confusion Matrix
conf_matrix_svm = confusion_matrix(y_test, y_pred_svm)
print(f'Confusion Matrix for SVM:\n{conf_matrix_svm}')
```

```
SVM - Accuracy: 0.8486
Precision: 0.0000
Recall: 0.0000
F1-score: 0.0000
ROC AUC: 0.5000
Confusion Matrix for SVM:
[[566   0]
 [101   0]]
```

Display Metrics in a Comparison Table

In [74]:
```
# Model Comparison Table
model_comparison = {
    'Model': ['Logistic Regression', 'Random Forest', 'SVM'],
    'Accuracy': [accuracy_logreg, accuracy_rf, accuracy_svm],
    'Precision': [precision_logreg, precision_rf, precision_svm],
    'Recall': [recall_logreg, recall_rf, recall_svm],
    'F1-score': [f1_logreg, f1_rf, f1_svm],
    'ROC AUC': [roc_auc_logreg, roc_auc_rf, roc_auc_svm]
}

comparison_df = pd.DataFrame(model_comparison)
print("\nModel Evaluation Comparison:")
print(comparison_df)
```

```
Model Evaluation Comparison:
                 Model  Accuracy  Precision    Recall  F1-score   ROC AUC
0  Logistic Regression  0.857571   0.593750  0.188119  0.285714  0.582575
1        Random Forest  0.937031   0.983607  0.594059  0.740741  0.796146
2                  SVM  0.848576   0.000000  0.000000  0.000000  0.500000
```

Decision Tree Model

In [75]:
```
from sklearn.tree import DecisionTreeClassifier
from sklearn.metrics import accuracy_score, precision_score, recall_score, f1_score, roc_auc_score, confusion_matrix
from sklearn import tree
```

Train the Decision Tree Model

In [76]:
```
# Instantiate the Decision Tree model
dt_model = DecisionTreeClassifier(random_state=42)

# Fit the model on the training data
dt_model.fit(X_train, y_train)

# Make predictions on the test data
y_pred_dt = dt_model.predict(X_test)
```

Model Evaluation

In [77]:
```
# Evaluate the Decision Tree
```

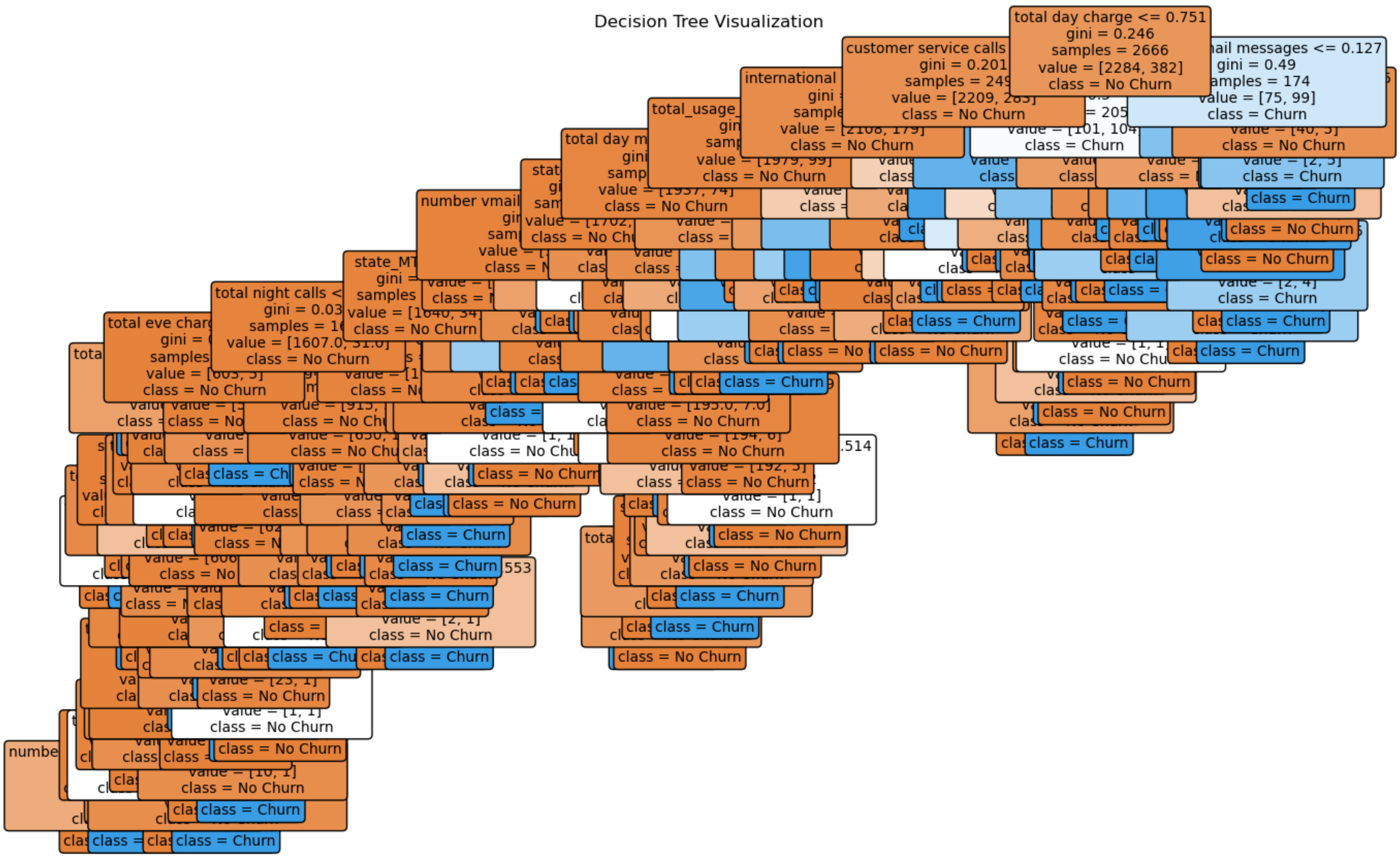
```
accuracy_dt = accuracy_score(y_test, y_pred_dt)
precision_dt = precision_score(y_test, y_pred_dt)
recall_dt = recall_score(y_test, y_pred_dt)
f1_dt = f1_score(y_test, y_pred_dt)
roc_auc_dt = roc_auc_score(y_test, y_pred_dt)

# Display the evaluation metrics for Decision Tree
print(f'Decision Tree - Accuracy: {accuracy_dt:.4f}')
print(f'Precision: {precision_dt:.4f}')
print(f'Recall: {recall_dt:.4f}')
print(f'F1-score: {f1_dt:.4f}')
print(f'ROC AUC: {roc_auc_dt:.4f}')

# Confusion Matrix
conf_matrix_dt = confusion_matrix(y_test, y_pred_dt)
print(f'Confusion Matrix for Decision Tree:\n{conf_matrix_dt}')
```

```
Decision Tree - Accuracy: 0.9160
Precision: 0.7103
Recall: 0.7525
F1-score: 0.7308
ROC AUC: 0.8489
Confusion Matrix for Decision Tree:
[[535  31]
 [ 25  76]]
```

Visualization of the Decision Tree

In [78]:

```
# Plot the Decision Tree
plt.figure(figsize=(15, 10))
tree.plot_tree(dt_model, filled=True, feature_names=X_train.columns, class_names=['No Churn', 'Churn'], rounded=True,
plt.title("Decision Tree Visualization")
plt.show()
```




In [79]:

```
# Model comparison dictionary
model_comparison = {
    'Model': ['Logistic Regression', 'Random Forest', 'SVM', 'Decision Tree'],
    'Accuracy': [accuracy_logreg, accuracy_rf, accuracy_svm, accuracy_dt],
    'Precision': [precision_logreg, precision_rf, precision_svm, precision_dt],
    'Recall': [recall_logreg, recall_rf, recall_svm, recall_dt],
    'F1-score': [f1_logreg, f1_rf, f1_svm, f1_dt],
    'ROC AUC': [roc_auc_logreg, roc_auc_rf, roc_auc_svm, roc_auc_dt]
}
```

```
# Create a DataFrame to display the model comparison
comparison_df = pd.DataFrame(model_comparison)

# Print the comparison table
print("\nModel Evaluation Comparison:")
print(comparison_df)
```

```
Model Evaluation Comparison:
                 Model  Accuracy  Precision    Recall  F1-score   ROC AUC
0  Logistic Regression  0.857571   0.593750  0.188119  0.285714  0.582575
1        Random Forest  0.937031   0.983607  0.594059  0.740741  0.796146
2                  SVM  0.848576   0.000000  0.000000  0.000000  0.500000
3        Decision Tree  0.916042   0.710280  0.752475  0.730769  0.848852
```

# CONCLUSION

# Random Forest

Random Forest is the best performing model in terms of accuracy, precision, recall, and F1-score. Accuracy: 93.70% - High accuracy, suggesting the model is making correct predictions overall. Precision: 98.36% - Extremely high precision, indicating that when it predicts positives, it is very likely to be correct. However, its recall (59.41%) needs be improved

# Decision Tree

Is the second best with:Accuracy 91.60% - High accuracy and overall good performance. Precision: 71.03% - It predicts positives correctly with a good precision. Recall: 75.25% - It successfully identifies a large proportion of the positive cases Making it a good option if identifying positive cases is crucial.

# Logistic Regression

Logistic Regression has good accuracy but struggles with low recall and F1-score, so it may not be ideal if identifying positives is important. Accuracy: 85.76% - It has a decent accuracy but struggles with identifying positive cases, as reflected in its low recall

(18.81%). Precision: 59.38% - It predicts positives correctly 59.38% of the time. Recall: 18.81% - It misses many positive instances.

# Support Vector Machine (SVM)

Is the worst Model here SVM is not usable as it fails to predict any positive cases, leading to zero precision, recall, and F1-score. Accuracy: 84.86% - Similar to Logistic Regression, but this is misleading as the model fails to identify any positives. Precision, Recall, and F1-Score: All are 0 because the model never predicts a positive class, making it useless in its current state. ROC AUC: 50.00% - It performs as well as random guessing.

# Hyperparameter Tuning above models

Random Forest Hyperparameter Tuning

In [ ]:
```
from sklearn.ensemble import RandomForestClassifier
from sklearn.model_selection import GridSearchCV

# Hyperparameter grid for Random Forest
param_grid_rf = {
    'n_estimators': [100, 200, 300],
    'max_depth': [10, 20, None],
    'min_samples_split': [2, 5, 10],
    'min_samples_leaf': [1, 2, 4],
    'max_features': ['auto', 'sqrt'],
    'bootstrap': [True, False]
}

# Initialize Random Forest model
rf = RandomForestClassifier()

# Use GridSearchCV to search the best parameters
grid_rf = GridSearchCV(estimator=rf, param_grid=param_grid_rf, cv=5, scoring='accuracy')

# Fit the grid search to the data
grid_rf.fit(X_train, y_train)

# Best hyperparameters
```

```
print("Best Parameters:", grid_rf.best_params_)
```

Decision Tree Hyperparameter Tuning

In [83]:
```
from sklearn.tree import DecisionTreeClassifier
from sklearn.model_selection import GridSearchCV

# Hyperparameter grid for Decision Tree
param_grid_dt = {
    'max_depth': [10, 20, None],
    'min_samples_split': [2, 5, 10],
    'min_samples_leaf': [1, 2, 4],
    'max_features': ['auto', 'sqrt'],
    'criterion': ['gini', 'entropy']
}

# Initialize Decision Tree model
dt = DecisionTreeClassifier()

# Use GridSearchCV to search the best parameters
grid_dt = GridSearchCV(estimator=dt, param_grid=param_grid_dt, cv=5, scoring='accuracy')

# Fit the grid search to the data
grid_dt.fit(X_train, y_train)

# Best hyperparameters
print("Best Parameters:", grid_dt.best_params_)
```

```
Best Parameters: {'criterion': 'gini', 'max_depth': 10, 'max_features': 'sqrt', 'min_samples_leaf': 2, 'min_samples_s
plit': 10}
```

# Recommendations

Preferred Model: Random Forest

Based on the evaluation metrics, Random Forest stands out as the most effective model. It has the highest accuracy, excellent precision, recall, and F1-score. Its ROC AUC score of 0.80 confirms that it is good at distinguishing between churned and non-churned customers. This model should be the primary choice for predicting customer churn. It strikes a good balance between performance and interpretability. Additionally, Random Forest provides feature importance, which can offer valuable insights into the factors driving customer churn. Alternative Model: Logistic Regression

For a simpler, more interpretable model, Logistic Regression might still be useful. However, its low recall and F1-score indicate that improvements are needed. Consider fine-tuning hyperparameters or incorporating additional features that might help improve recall and overall performance. SVM:

SVM should be discarded for this particular task. The model's failure to predict any churn cases and its poor ROC AUC score suggest that it is not suitable for this dataset. You could consider revisiting SVM after extensive tuning, but for now, Random Forest provides a much better solution.

# Next Steps

1.Focus on Model Improvement Random Forest and Decision Tree are the best performing models. However, Random Forest has a good balance of precision and recall, making it ideal for identifying potential churn. Since Decision Tree is also performing well, improving it through hyperparameter tuning or pruning can also enhance performance

2.Address Class Imbalance Many churn models suffer from class imbalance (where the number of churned customers is much smaller than non-churned customers). This could explain some of the low recall and performance issues, especially with Logistic Regression and SVM

3.Model Evaluation and Validation All models should be evaluated using cross-validation to ensure their performance is robust and not subject to overfitting. Since the data might be imbalanced, precision, recall, and F1-score should be prioritized, especially recall to ensure churned customers are being detected.

4.Customer Retention Strategies Use the churn prediction model to create actionable strategies for customer retention. For instance, if the model identifies high-risk customers, a targeted marketing campaign can be launched to offer promotions, improve customer service, or address specific customer pain points

5.Continuous Improvement & Feedback Loop Model Drift: Over time, customer behavior might change. Implement a feedback loop to continuously update and improve the model.

6.Business Collaboration and Insights Collaborate with the marketing, customer service, and product teams to ensure that churn insights are used effectively in business strategie

In [ ]: