Import Libraries :

In [1]:
```
import numpy as np
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as py
import warnings
warnings.filterwarnings("ignore")
```

Import Dataset :

In [2]:
```
data = pd.read_csv(r"\Customer Churn.csv")
```

Dataset Description :

The dataset contains **7043 records** and **21 columns** related to customer information for a telecom company, aimed at analyzing customer churn. Below is a detailed description of the columns:

1. **customerID**: Unique identifier for each customer (non-null object).
2. **gender**: Customer gender (Male/Female).
3. **SeniorCitizen**: Indicates if the customer is a senior citizen (0 = No, 1 = Yes).
4. **Partner**: Whether the customer has a partner (Yes/No).
5. **Dependents**: Whether the customer has dependents (Yes/No).
6. **tenure**: Number of months the customer has stayed with the company.
7. **PhoneService**: Whether the customer has phone service (Yes/No).
8. **MultipleLines**: Whether the customer has multiple lines (Yes/No/No phone service).
9. **InternetService**: Type of internet service the customer has (DSL, Fiber optic, or No).
10. **OnlineSecurity**: Whether the customer has online security service (Yes/No/No internet service).
11. **OnlineBackup**: Whether the customer has online backup (Yes/No/No internet service).
12. **DeviceProtection**: Whether the customer has device protection (Yes/No/No internet service).
13. **TechSupport**: Whether the customer has tech support (Yes/No/No internet service).
14. **StreamingTV**: Whether the customer has streaming TV service (Yes/No/No internet service).
15. **StreamingMovies**: Whether the customer has streaming movies service (Yes/No/No internet service).
16. **Contract**: The contract type (Month-to-month, One year, Two year).
17. **PaperlessBilling**: Whether the customer is on paperless billing (Yes/No).
18. **PaymentMethod**: The payment method used by the customer (Electronic check, Mailed check, Bank transfer, Credit card).
19. **MonthlyCharges**: The amount charged to the customer per month (float).
20. **TotalCharges**: Total amount charged (stored as an object but should be numerical).
21. **Churn**: Whether the customer churned (Yes/No).

Data Types:

- Most columns are categorical (object), except for **tenure**, **SeniorCitizen** (both int64), and **MonthlyCharges** (float64).
- **TotalCharges** is stored as a string/object but should be converted to numerical for analysis.

Observations:

- The dataset includes a wide variety of customer services, including internet, phone, and support-related services, along with customer demographics (senior citizen, partner, dependents).
- The target variable for churn prediction is **Churn**.

Explore data :

In [3]:
```
data.head()
```

Out[3]:

	customerID	gender	SeniorCitizen	Partner	Dependents	tenure	PhoneService	MultipleLines	In
0	7590-VHVEG	Female	0	Yes	No	1	No	No phone service	
1	5575-GNVDE	Male	0	No	No	34	Yes	No	
2	3668-QPYBK	Male	0	No	No	2	Yes	No	
3	7795-CFOCW	Male	0	No	No	45	No	No phone service	
4	9237-HQITU	Female	0	No	No	2	Yes	No	

5 rows × 21 columns

In [4]:
```
data.tail()
```

Out[4]:

	customerID	gender	SeniorCitizen	Partner	Dependents	tenure	PhoneService	MultipleLines
7038	6840-RESVB	Male	0	Yes	Yes	24	Yes	Yes
7039	2234-XADUH	Female	0	Yes	Yes	72	Yes	Yes
7040	4801-JZAZL	Female	0	Yes	Yes	11	No	No phone service
7041	8361-LTMKD	Male	1	Yes	No	4	Yes	Yes
7042	3186-AJIEK	Male	0	No	No	66	Yes	No

5 rows × 21 columns

In [5]:
```
data.shape
```

Out[5]:
```
(7043, 21)
```

In [6]:
```
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 7043 entries, 0 to 7042
Data columns (total 21 columns):
 #   Column            Non-Null Count  Dtype  
---  ------            --------------  -----  
 0   customerID        7043 non-null   object 
 1   gender            7043 non-null   object 
 2   SeniorCitizen     7043 non-null   int64  
 3   Partner           7043 non-null   object 
 4   Dependents        7043 non-null   object 
 5   tenure            7043 non-null   int64  
 6   PhoneService      7043 non-null   object 
 7   MultipleLines     7043 non-null   object 
 8   InternetService   7043 non-null   object 
 9   OnlineSecurity    7043 non-null   object 
 10  OnlineBackup      7043 non-null   object 
 11  DeviceProtection  7043 non-null   object 
 12  TechSupport       7043 non-null   object 
 13  StreamingTV       7043 non-null   object 
 14  StreamingMovies   7043 non-null   object 
 15  Contract          7043 non-null   object 
 16  PaperlessBilling  7043 non-null   object 
 17  PaymentMethod     7043 non-null   object 
 18  MonthlyCharges    7043 non-null   float64
 19  TotalCharges      7043 non-null   object 
 20  Churn             7043 non-null   object 
dtypes: float64(1), int64(2), object(18)
memory usage: 1.1+ MB
```

In [7]:
```
data.columns
```

Out[7]:
```
Index(['customerID', 'gender', 'SeniorCitizen', 'Partner', 'Dependents',
       'tenure', 'PhoneService', 'MultipleLines', 'InternetService',
       'OnlineSecurity', 'OnlineBackup', 'DeviceProtection', 'TechSupport',
       'StreamingTV', 'StreamingMovies', 'Contract', 'PaperlessBilling',
       'PaymentMethod', 'MonthlyCharges', 'TotalCharges', 'Churn'],
      dtype='object')
```

In [8]:
```
len(data.columns)
```

Out[8]:
```
21
```

In [9]:
```
data.select_dtypes("O")
```

Out[9]:

	customerID	gender	Partner	Dependents	PhoneService	MultipleLines	InternetService	Onlin
0	7590-VHVEG	Female	Yes	No	No	No phone service	DSL	
1	5575-GNVDE	Male	No	No	Yes	No	DSL	
2	3668-QPYBK	Male	No	No	Yes	No	DSL	
3	7795-CFOCW	Male	No	No	No	No phone service	DSL	
4	9237-HQITU	Female	No	No	Yes	No	Fiber optic	
...	...	...	...	...	...	...	...	
7038	6840-RESVB	Male	Yes	Yes	Yes	Yes	DSL	
7039	2234-XADUH	Female	Yes	Yes	Yes	Yes	Fiber optic	
7040	4801-JZAZL	Female	Yes	Yes	No	No phone service	DSL	
7041	8361-LTMKD	Male	Yes	No	Yes	Yes	Fiber optic	
7042	3186-AJIEK	Male	No	No	Yes	No	Fiber optic	

7043 rows × 18 columns

In [10]:
```
data.select_dtypes("int")
```

Out[10]:

	SeniorCitizen	tenure
0	0	1
1	0	34
2	0	2
3	0	45
4	0	2
...	...	...
7038	0	24
7039	0	72
7040	0	11
7041	1	4
7042	0	66

7043 rows × 2 columns

In [11]:
```
data.select_dtypes("float")
```

Out[11]:

	MonthlyCharges
0	29.85
1	56.95
2	53.85
3	42.30
4	70.70
...	...
7038	84.80
7039	103.20
7040	29.60
7041	74.40
7042	105.65

7043 rows × 1 columns

In [12]:
```
data.count()
```

Out[12]:
```
customerID          7043
gender              7043
SeniorCitizen       7043
Partner             7043
Dependents          7043
tenure              7043
PhoneService        7043
MultipleLines       7043
InternetService     7043
OnlineSecurity      7043
OnlineBackup        7043
DeviceProtection    7043
TechSupport         7043
StreamingTV         7043
StreamingMovies     7043
Contract            7043
PaperlessBilling    7043
PaymentMethod       7043
MonthlyCharges      7043
TotalCharges        7043
Churn               7043
dtype: int64
```

There is no null values in dataset

In [13]:
```
data.isna().sum()
```

Out[13]:
```
customerID          0
gender              0
SeniorCitizen       0
Partner             0
Dependents          0
tenure              0
PhoneService        0
MultipleLines       0
InternetService     0
OnlineSecurity      0
OnlineBackup        0
DeviceProtection    0
TechSupport         0
StreamingTV         0
StreamingMovies     0
Contract            0
PaperlessBilling    0
PaymentMethod       0
MonthlyCharges      0
TotalCharges        0
Churn               0
dtype: int64
```

In [14]:
```
data.nunique()
```

Out[14]:
```
customerID          7043
gender                 2
SeniorCitizen          2
Partner                2
Dependents             2
tenure                73
PhoneService           2
MultipleLines          3
InternetService        3
OnlineSecurity         3
OnlineBackup           3
DeviceProtection       3
TechSupport            3
StreamingTV            3
StreamingMovies        3
Contract               3
PaperlessBilling       2
PaymentMethod          4
MonthlyCharges      1585
TotalCharges        6531
Churn                  2
dtype: int64
```

There are blank rows in TotalCharges column

In [15]:
```
data[data["TotalCharges"] == " "]
```

Out[15]:

	customerID	gender	SeniorCitizen	Partner	Dependents	tenure	PhoneService	MultipleLines
488	4472-LVYGI	Female	0	Yes	Yes	0	No	No phone service
753	3115-CZMZD	Male	0	No	Yes	0	Yes	No
936	5709-LVOEQ	Female	0	Yes	Yes	0	Yes	No
1082	4367-NUYAO	Male	0	Yes	Yes	0	Yes	Yes
1340	1371-DWPAZ	Female	0	Yes	Yes	0	No	No phone service
3331	7644-OMVMY	Male	0	Yes	Yes	0	Yes	No
3826	3213-VVOLG	Male	0	Yes	Yes	0	Yes	Yes
4380	2520-SGTTA	Female	0	Yes	Yes	0	Yes	No
5218	2923-ARZLG	Male	0	Yes	Yes	0	Yes	No
6670	4075-WKNIU	Female	0	Yes	Yes	0	Yes	Yes
6754	2775-SEFEE	Male	0	No	Yes	0	Yes	Yes

11 rows × 21 columns

Replace blank rows into 0 and convert it into float data type to perform calculations

In [16]:
```
data.columns
```

Out[16]:
```
Index(['customerID', 'gender', 'SeniorCitizen', 'Partner', 'Dependents',
       'tenure', 'PhoneService', 'MultipleLines', 'InternetService',
       'OnlineSecurity', 'OnlineBackup', 'DeviceProtection', 'TechSupport',
       'StreamingTV', 'StreamingMovies', 'Contract', 'PaperlessBilling',
       'PaymentMethod', 'MonthlyCharges', 'TotalCharges', 'Churn'],
      dtype='object')
```

In [17]:
```
# replace blank values
data["TotalCharges"] = data["TotalCharges"].replace(" ","0")

# Convert data type of that column into float
data["TotalCharges"] = data["TotalCharges"].astype("float")


# Run the data
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 7043 entries, 0 to 7042
Data columns (total 21 columns):
 #   Column            Non-Null Count  Dtype  
---  ------            --------------  -----  
 0   customerID        7043 non-null   object 
 1   gender            7043 non-null   object 
 2   SeniorCitizen     7043 non-null   int64  
 3   Partner           7043 non-null   object 
 4   Dependents        7043 non-null   object 
 5   tenure            7043 non-null   int64  
 6   PhoneService      7043 non-null   object 
 7   MultipleLines     7043 non-null   object 
 8   InternetService   7043 non-null   object 
 9   OnlineSecurity    7043 non-null   object 
 10  OnlineBackup      7043 non-null   object 
 11  DeviceProtection  7043 non-null   object 
 12  TechSupport       7043 non-null   object 
 13  StreamingTV       7043 non-null   object 
 14  StreamingMovies   7043 non-null   object 
 15  Contract          7043 non-null   object 
 16  PaperlessBilling  7043 non-null   object 
 17  PaymentMethod     7043 non-null   object 
 18  MonthlyCharges    7043 non-null   float64
 19  TotalCharges      7043 non-null   float64
 20  Churn             7043 non-null   object 
dtypes: float64(2), int64(2), object(17)
memory usage: 1.1+ MB
```

Check for dataset descriptive analysis :

In [18]:
```
data.describe()
```

Out[18]:

	SeniorCitizen	tenure	MonthlyCharges	TotalCharges
count	7043.000000	7043.000000	7043.000000	7043.000000
mean	0.162147	32.371149	64.761692	2279.734304
std	0.368612	24.559481	30.090047	2266.794470
min	0.000000	0.000000	18.250000	0.000000
25%	0.000000	9.000000	35.500000	398.550000
50%	0.000000	29.000000	70.350000	1394.550000
75%	0.000000	55.000000	89.850000	3786.600000
max	1.000000	72.000000	118.750000	8684.800000

Check for duplicates values :

In [19]:
```
data[data.duplicated()]
```

Out[19]:

customerID	gender	SeniorCitizen	Partner	Dependents	tenure	PhoneService	MultipleLines	Inte

0 rows × 21 columns

In [20]:
```
data.duplicated().sum()
```

Out[20]:
```
0
```

In [21]:
```
data["customerID"].duplicated().sum() # There is no duplicate values for customerID c
```

Out[21]:
```
0
```

Convert SeniorCitizen column values (0,1) into "yes" and "no" for mapping. Also, it is easy to understand.

In [22]:
```
data["SeniorCitizen"].unique()
```

Out[22]:
```
array([0, 1], dtype=int64)
```

In [23]:
```
# Create function to map the values

def convert(value):
    if value == 1:
        return "yes"
    else:
        return "no"

# Apply function to that column
data["SeniorCitizen"] = data["SeniorCitizen"].apply(convert)


# Check data
data.head(5)
```

Out[23]:

	customerID	gender	SeniorCitizen	Partner	Dependents	tenure	PhoneService	MultipleLines	In
0	7590-VHVEG	Female	no	Yes	No	1	No	No phone service	
1	5575-GNVDE	Male	no	No	No	34	Yes	No	
2	3668-QPYBK	Male	no	No	No	2	Yes	No	
3	7795-CFOCW	Male	no	No	No	45	No	No phone service	
4	9237-HQITU	Female	no	No	No	2	Yes	No	

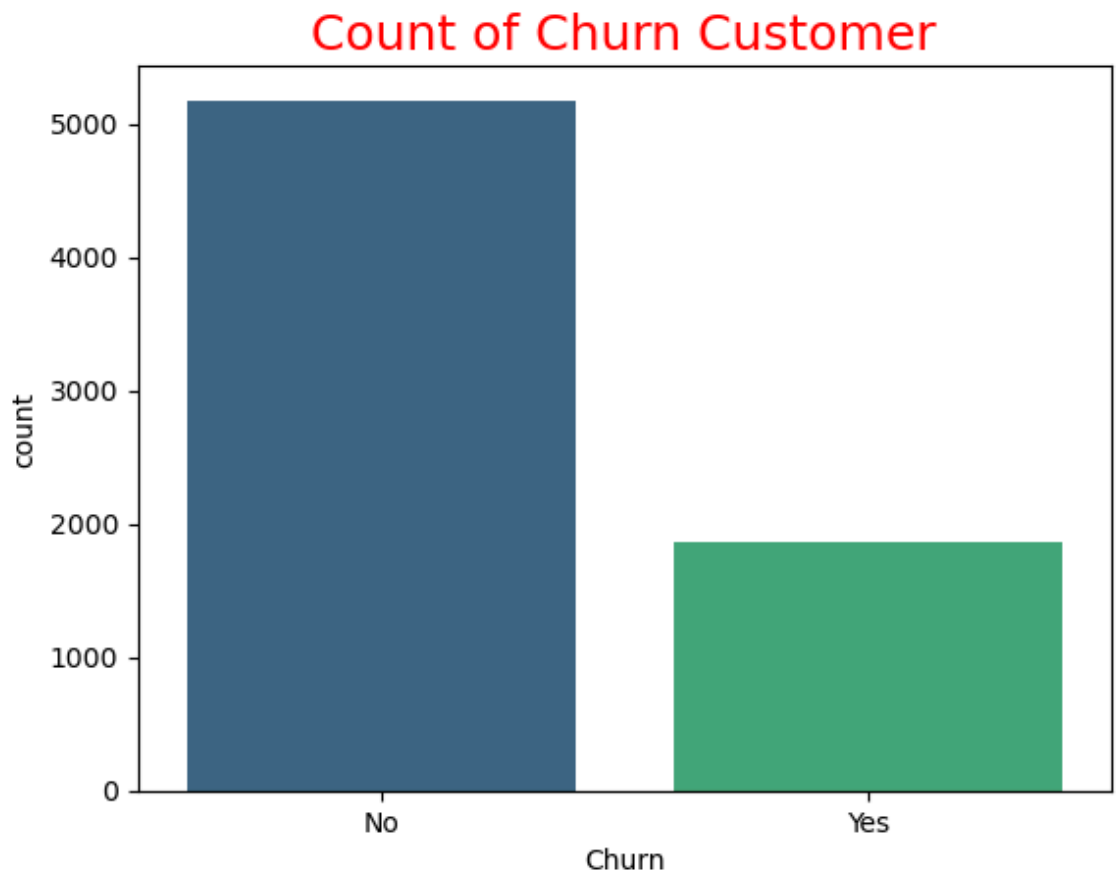
5 rows × 21 columns

Count of Churned and Non-Churned Customers :

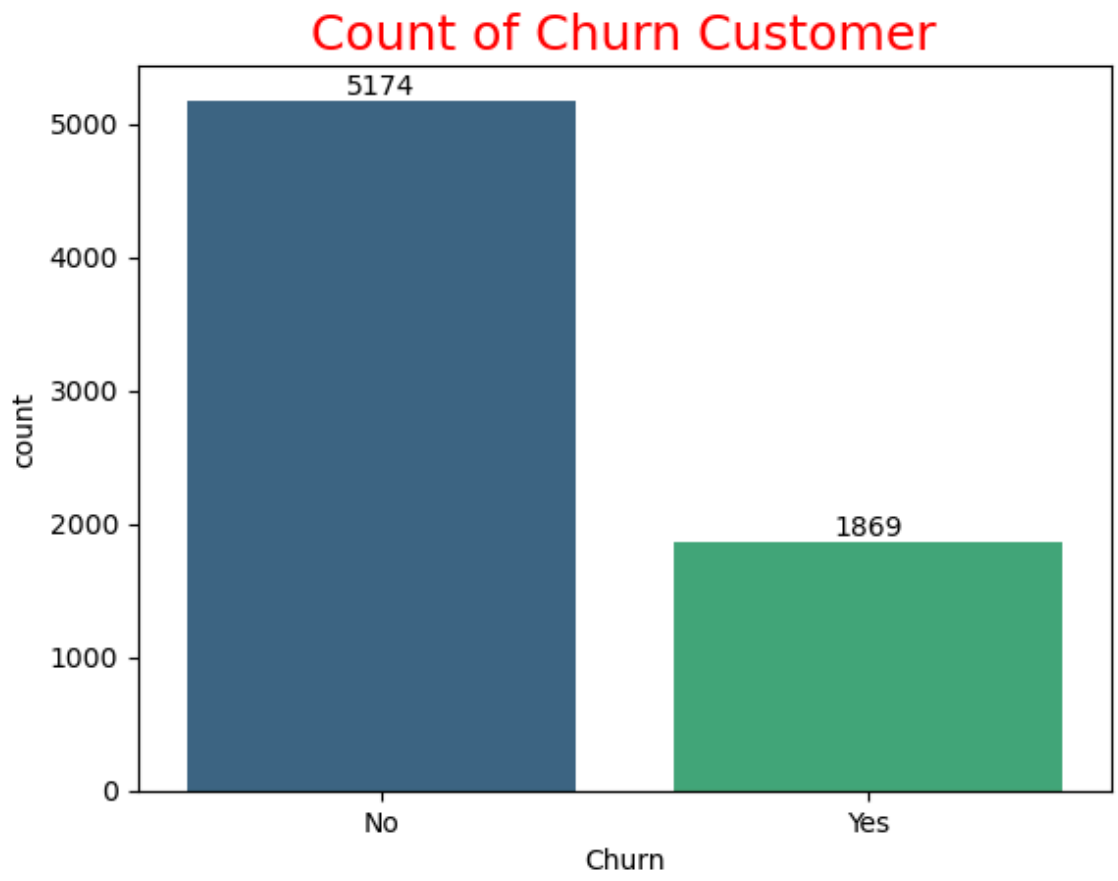
In [24]:
```
data.columns
```

Out[24]:
```
Index(['customerID', 'gender', 'SeniorCitizen', 'Partner', 'Dependents',
       'tenure', 'PhoneService', 'MultipleLines', 'InternetService',
       'OnlineSecurity', 'OnlineBackup', 'DeviceProtection', 'TechSupport',
       'StreamingTV', 'StreamingMovies', 'Contract', 'PaperlessBilling',
       'PaymentMethod', 'MonthlyCharges', 'TotalCharges', 'Churn'],
      dtype='object')
```

In [28]:
```
sns.countplot(data = data , x = "Churn", palette = "viridis")
py.title("Count of Churn Customer", fontsize = 18 , color = "red")
py.show()
```



In [30]:
```
# Store the plot in ax
ax = sns.countplot(data = data , x = "Churn", palette = "viridis")

# It will return count on bars
ax.bar_label(ax.containers[0])


py.title("Count of Churn Customer", fontsize = 18 , color = "red")
py.show()
```



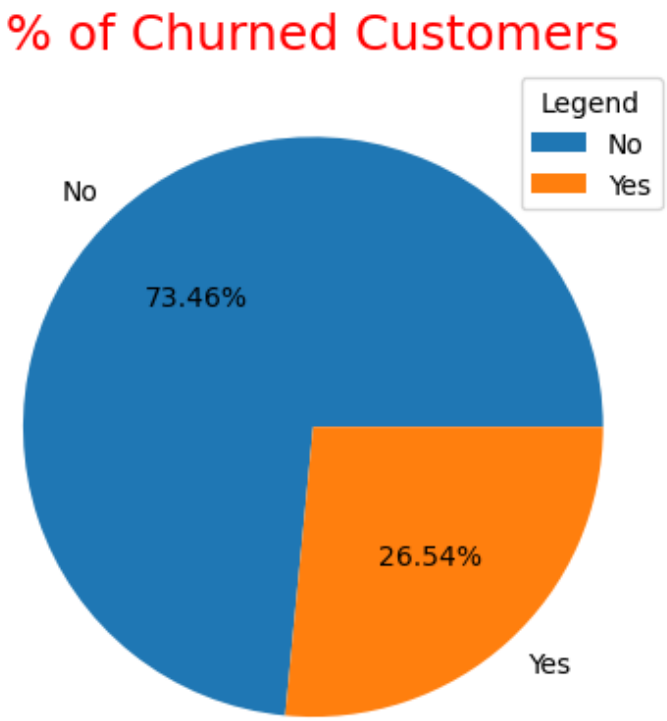
Percentage of Churned and Non-Churned Customers :

In [47]:
```
data.groupby("Churn").agg({"Churn" : "count"})
```

Out[47]:

	Churn
Churn	
No	5174
Yes	1869

In [55]:
```
df = data.groupby("Churn").agg({"Churn" : "count"})

py.pie(df["Churn"] ,  autopct = "%1.2f%%" , labels = df.index )
py.title("% of Churned Customers" , fontsize = 18 , color = "red" )
py.legend(title = "Legend")

py.show()
```



In [40]:
```
pd.DataFrame(data["Churn"].value_counts())
```

Out[40]:

	Churn
No	5174
Yes	1869

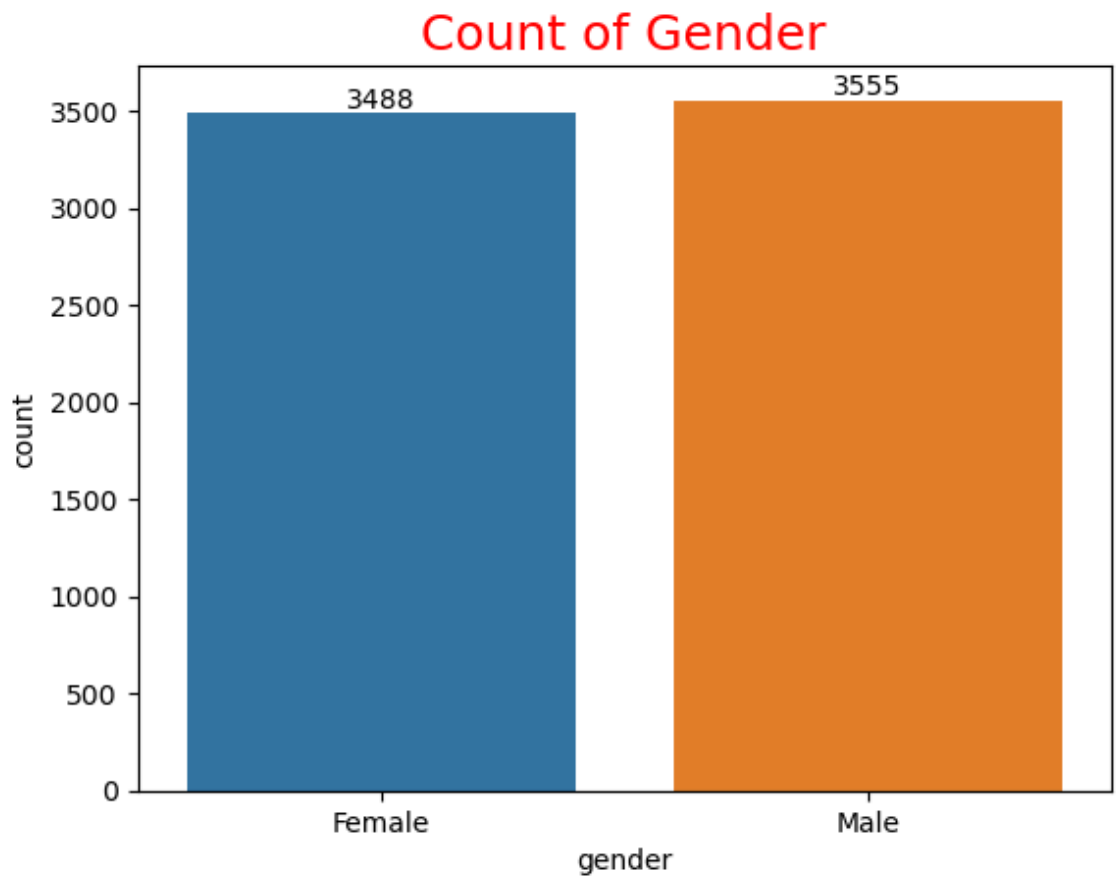
> Note : From the given pie chart, we can conclude that 26.54% customers churned

Count of Gender :

In [58]:
```
data.columns
```

Out[58]:
```
Index(['customerID', 'gender', 'SeniorCitizen', 'Partner', 'Dependents',
       'tenure', 'PhoneService', 'MultipleLines', 'InternetService',
       'OnlineSecurity', 'OnlineBackup', 'DeviceProtection', 'TechSupport',
       'StreamingTV', 'StreamingMovies', 'Contract', 'PaperlessBilling',
       'PaymentMethod', 'MonthlyCharges', 'TotalCharges', 'Churn'],
      dtype='object')
```

In [60]:
```
# Create countplot of gender
ax1 = sns.countplot(data = data , x = "gender")

# It will return count on bars
ax1.bar_label(ax1.containers[0])

py.title("Count of Gender", fontsize = 18, color = "red")
py.show() # To show the plot
```

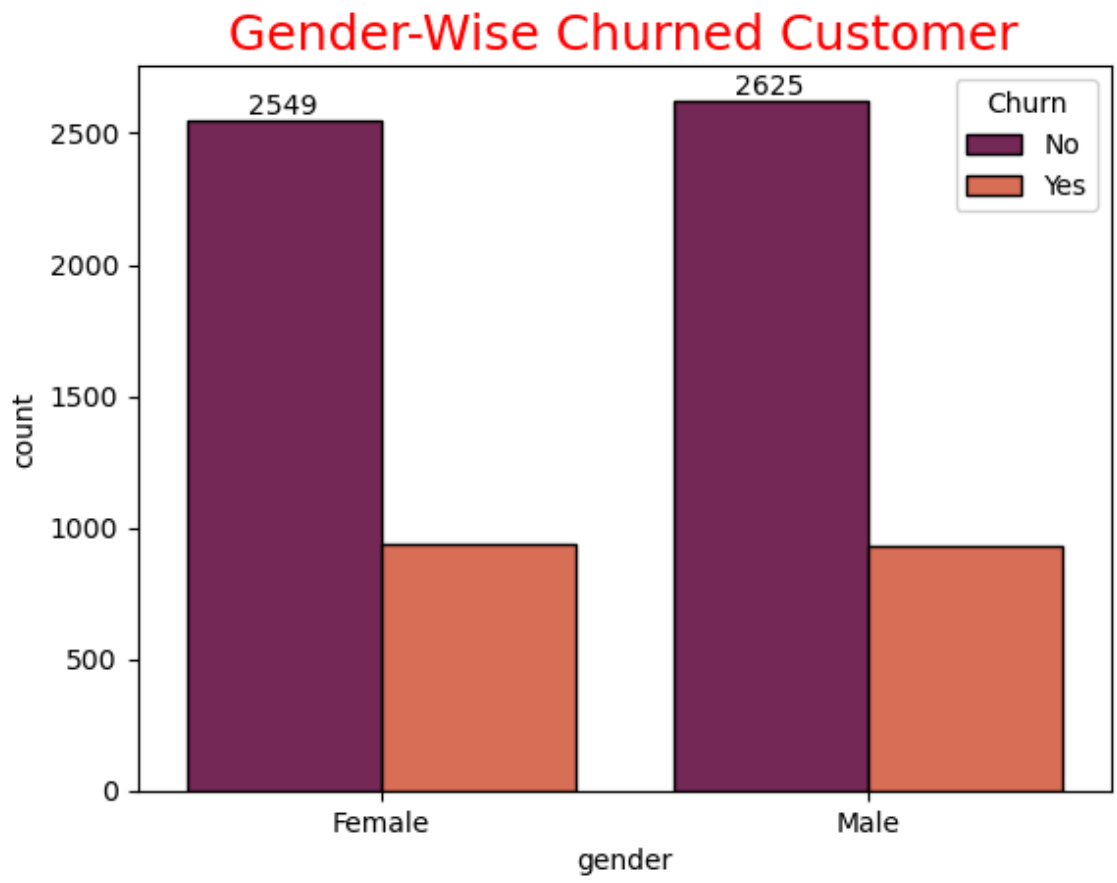


Gender-Wise Count of Churned Customers :

In [61]:
```
data.columns
```

Out[61]:
```
Index(['customerID', 'gender', 'SeniorCitizen', 'Partner', 'Dependents',
       'tenure', 'PhoneService', 'MultipleLines', 'InternetService',
       'OnlineSecurity', 'OnlineBackup', 'DeviceProtection', 'TechSupport',
       'StreamingTV', 'StreamingMovies', 'Contract', 'PaperlessBilling',
       'PaymentMethod', 'MonthlyCharges', 'TotalCharges', 'Churn'],
      dtype='object')
```

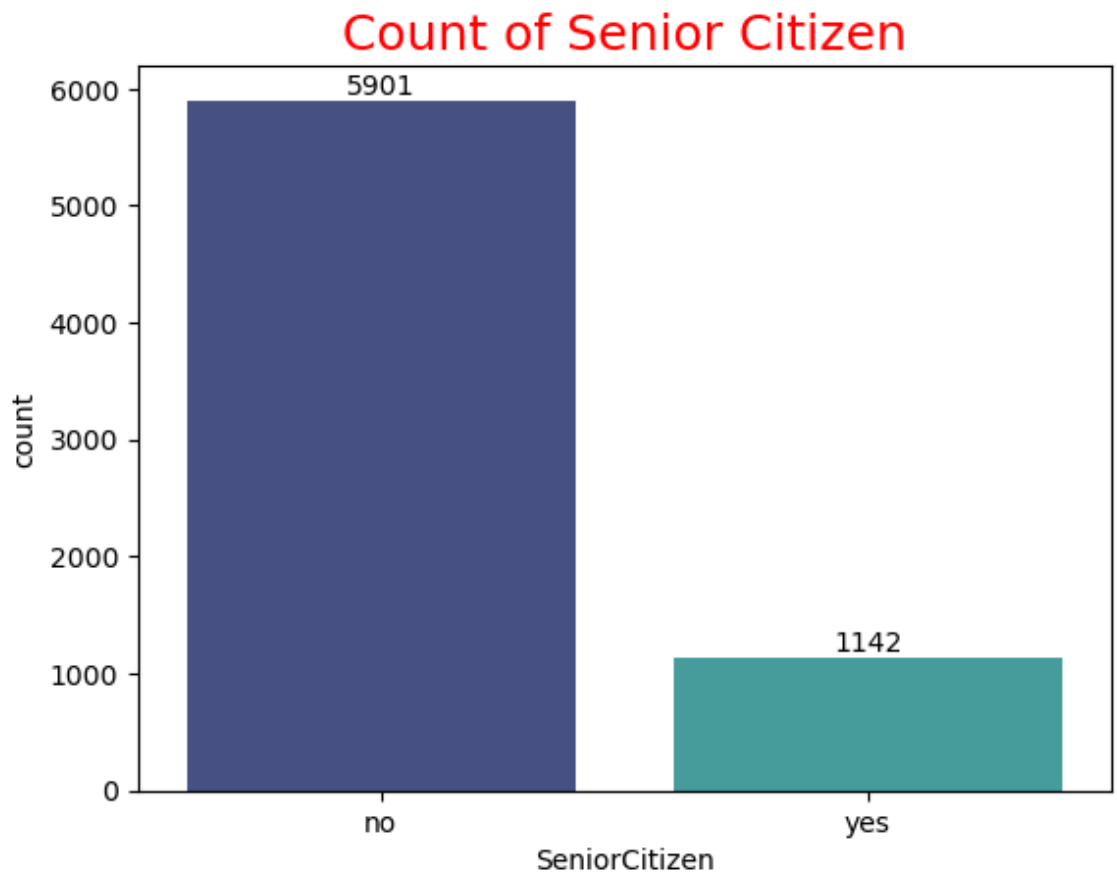
In [66]:
```
# Create countplot of gender-wise churn
ax2 = sns.countplot(data = data , x= "gender" , hue = "Churn", palette = "rocket", ec

# It will return count on bars
ax2.bar_label(ax2.containers[0])

py.title("Gender-Wise Churned Customer", fontsize = 18 , color = "red")
py.show()
```



> Male churned customers are almost same as female.

Count of Senior Citizen :

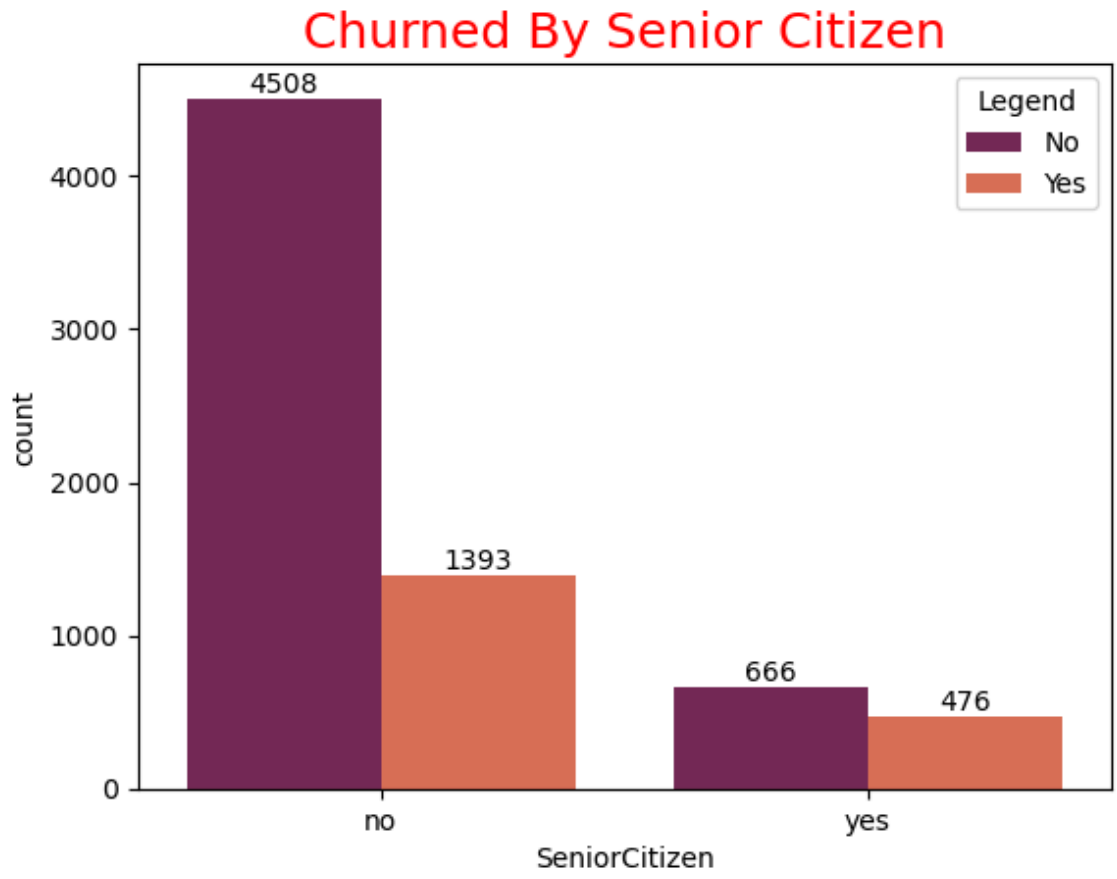
In [75]:
```
# Create countplot of Senior Citizen
ax3 = sns.countplot(data = data , x = "SeniorCitizen" , palette = "mako")

# It will return count on bars
ax3.bar_label(ax3.containers[0])

py.title("Count of Senior Citizen", fontsize = 18 , color = "red")

py.show()
```



Count of Senior Citizen Churned and Non- Chuned Customers :

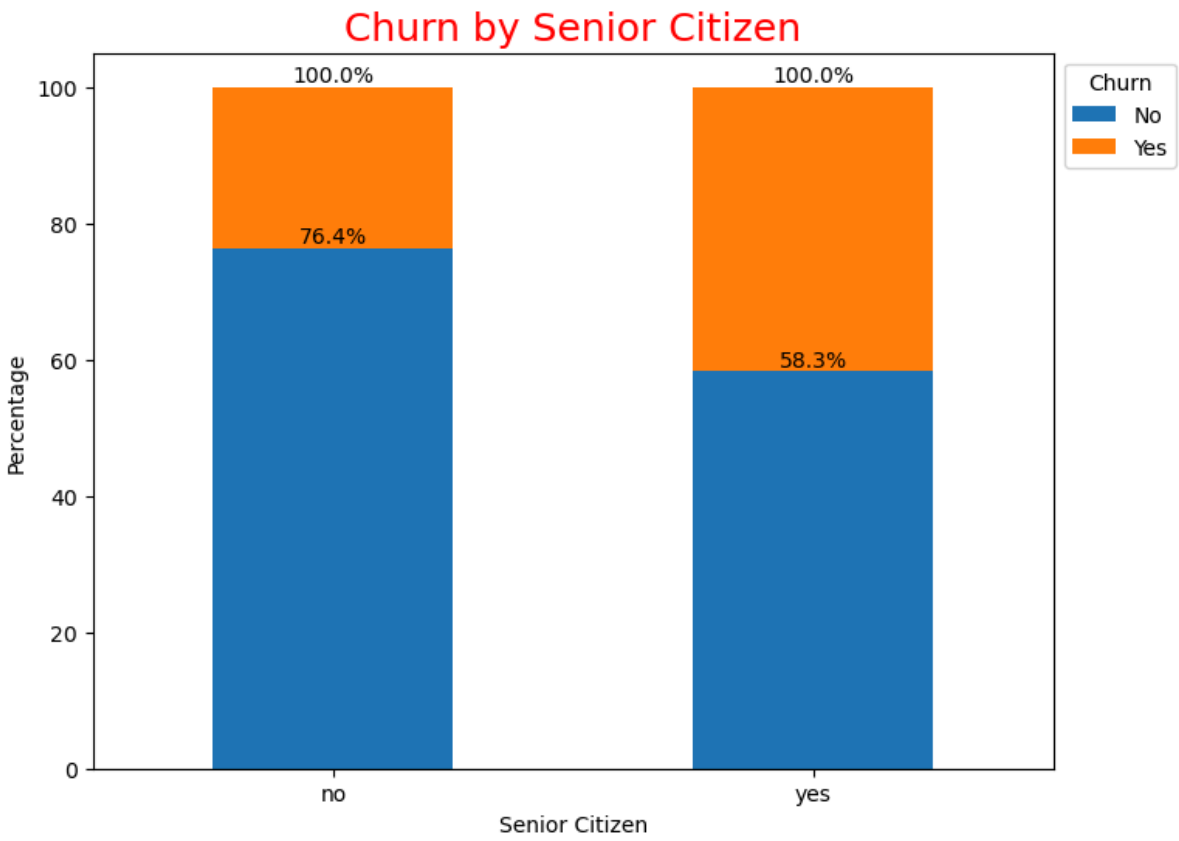
In [129…

```
ax4 = sns.countplot(data = data , x = "SeniorCitizen" , hue = "Churn" , palette = "rc

ax4.bar_label(ax4.containers[0])
ax4.bar_label(ax4.containers[1])

py.title("Churned By Senior Citizen" , fontsize = 18 , color = "red")
py.legend(title = "Legend")

py.show()
```



In [85]:

```
# Step 1: Create a crosstab to compute percentages
counts = pd.crosstab(data['SeniorCitizen'], data['Churn'], normalize='index') * 100

# Step 2: Plot stacked bar chart
ax4 = counts.plot(kind='bar', stacked=True,  figsize=(8, 6))

# Step 3: Add labels to show percentages
for container in ax4.containers:
    ax4.bar_label(container, fmt='%.1f%%')

# Step 4: Customize the chart
py.title("Churn by Senior Citizen", fontsize=18, color="red")
py.xlabel("Senior Citizen")
py.ylabel("Percentage")
py.legend(title="Churn", bbox_to_anchor = (1 , 1))
py.xticks(rotation = 0)
py.show()
```



> Greater % of people in Senior Citizen have churned out which is around 58.3

Churn by Tenure :

In [89]:
```
data.head(2)
```

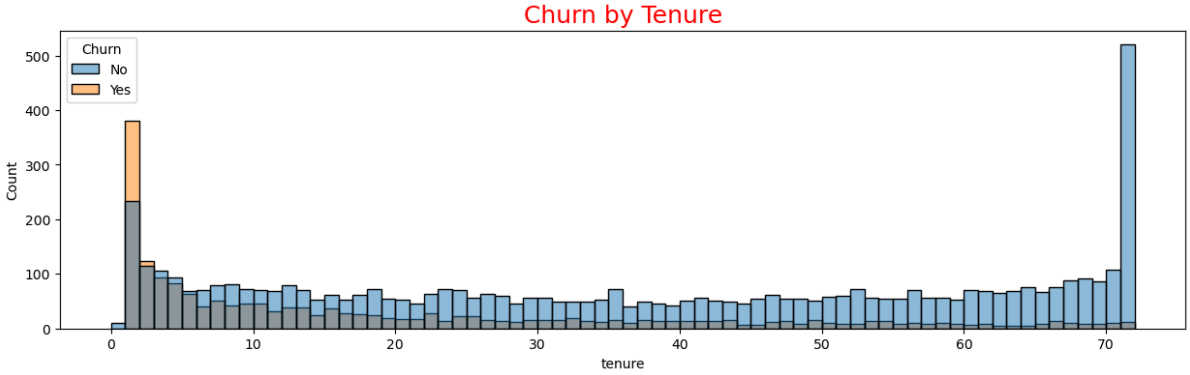
Out[89]:

	customerID	gender	SeniorCitizen	Partner	Dependents	tenure	PhoneService	MultipleLines	In
0	7590-VHVEG	Female	no	Yes	No	1	No	No phone service	
1	5575-GNVDE	Male	no	No	No	34	Yes	No	

2 rows × 21 columns

In [99]:
```
py.figure(figsize = (15,4))
sns.histplot(data = data , x = "tenure" , bins = 72 , hue = "Churn")
py.title("Churn by Tenure" , fontsize = 18 , color = "red")
py.show()
```

Churn by Tenure



> People who have uses services for long time stayed and people who have used services for 1 or 2 months churn out

Churn by Type of Contract :

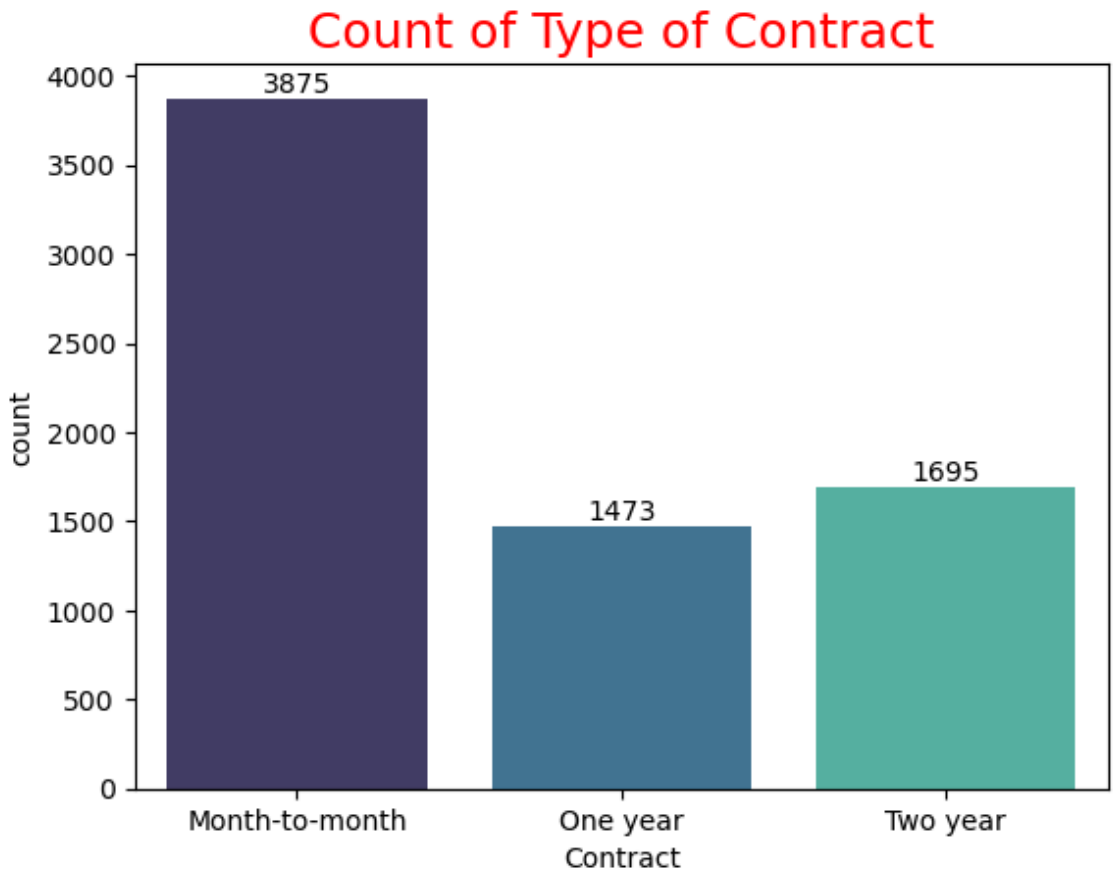
In [101…
```
data.head(2)
```

Out[101]:

	customerID	gender	SeniorCitizen	Partner	Dependents	tenure	PhoneService	MultipleLines	In
0	7590-VHVEG	Female	no	Yes	No	1	No	No phone service	
1	5575-GNVDE	Male	no	No	No	34	Yes	No	

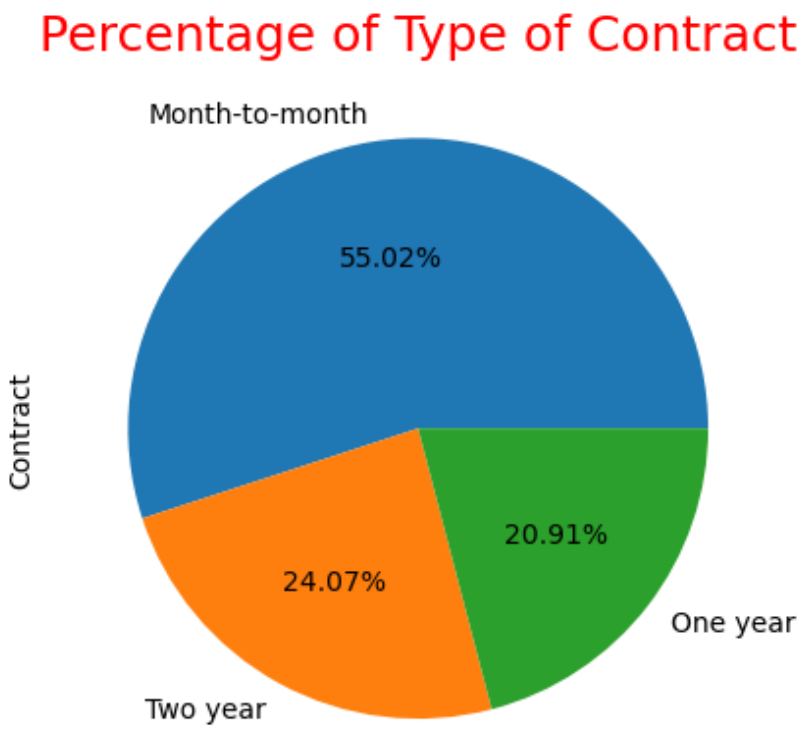
2 rows × 21 columns

In [104…
```
# Create countplot of Contract
ax5 = sns.countplot(data = data , x = "Contract" , palette = "mako")

# It will return count on bars
ax5.bar_label(ax5.containers[0])

py.title("Count of Type of Contract", fontsize = 18 , color = "red")

py.show()
```



In [110…

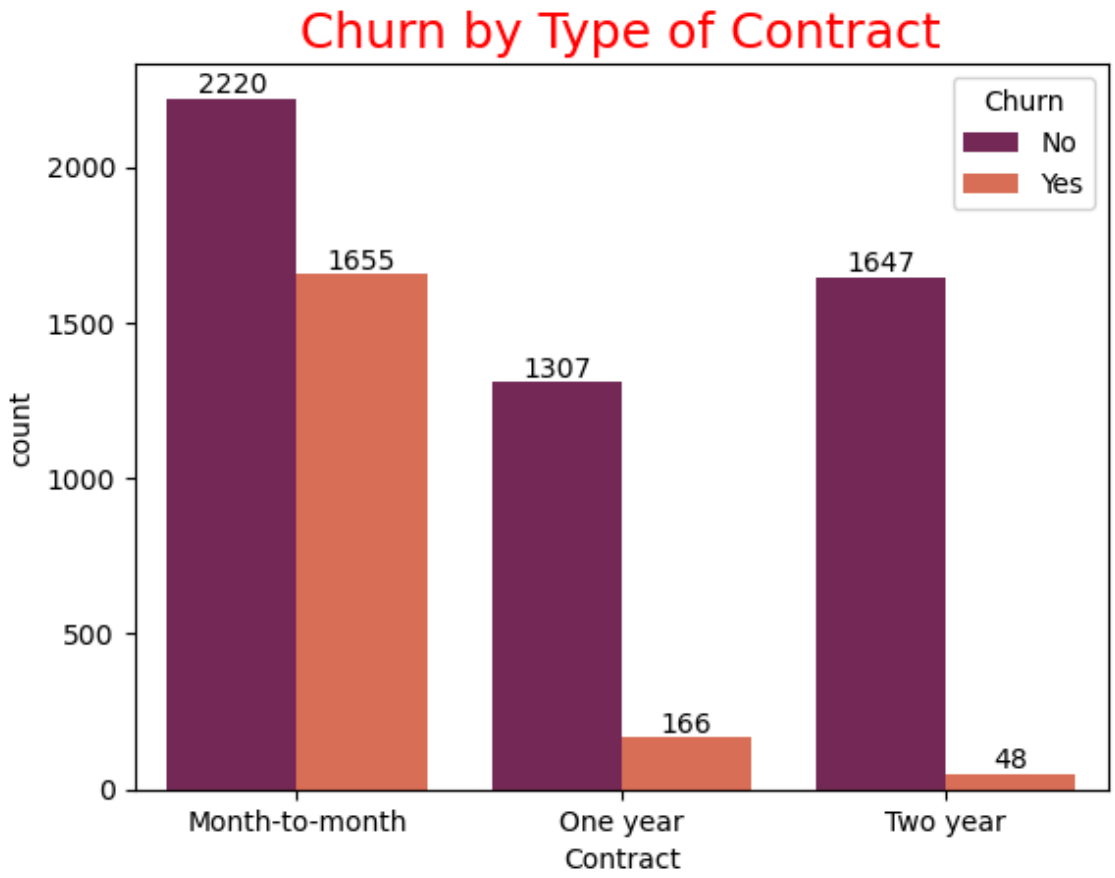
```
data["Contract"].value_counts().plot(kind = "pie" , autopct = "%1.2f%%")
py.title("Percentage of Type of Contract" , fontsize = 18 , color = "red")
py.show()
```



In [128…

```
# Create countplot of Contract
ax6 = sns.countplot(data = data , x = "Contract" , hue = "Churn" , palette = "rocket'

# It will return count on bars
ax6.bar_label(ax6.containers[0])
```

```
ax6.bar_label(ax6.containers[1])

py.title("Churn by Type of Contract", fontsize = 18 , color = "red")

py.show()
```



> From above bar chart we conclude that, churn is high for month-to-month contract One year and Two year contract has less churn

Churn by Services :

In [116…
```
data.head(2)
```

Out[116]:

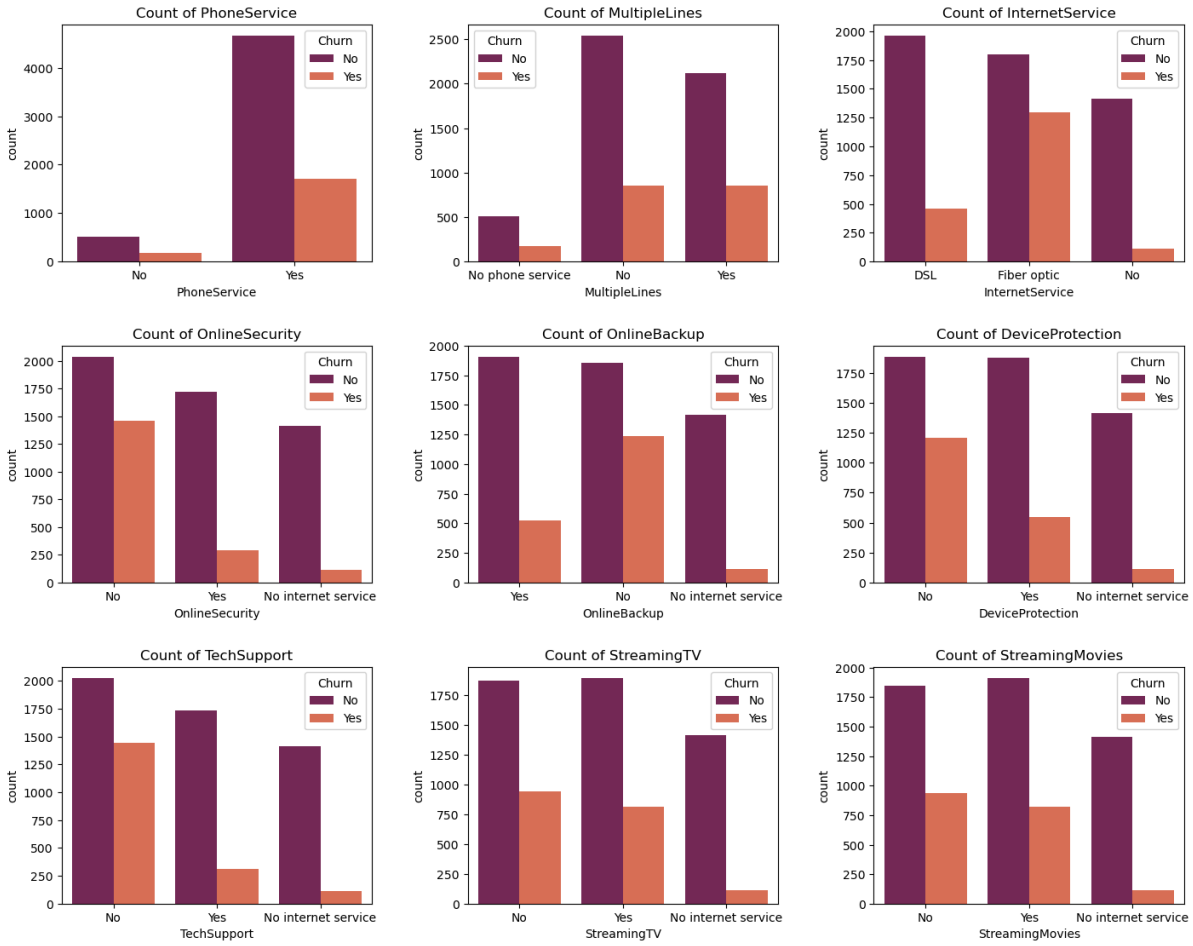
	customerID	gender	SeniorCitizen	Partner	Dependents	tenure	PhoneService	MultipleLines	In
0	7590-VHVEG	Female	no	Yes	No	1	No	No phone service	
1	5575-GNVDE	Male	no	No	No	34	Yes	No	

2 rows × 21 columns

In [112…
```
data.columns
```

Out[112]:
```
Index(['customerID', 'gender', 'SeniorCitizen', 'Partner', 'Dependents',
       'tenure', 'PhoneService', 'MultipleLines', 'InternetService',
       'OnlineSecurity', 'OnlineBackup', 'DeviceProtection', 'TechSupport',
       'StreamingTV', 'StreamingMovies', 'Contract', 'PaperlessBilling',
       'PaymentMethod', 'MonthlyCharges', 'TotalCharges', 'Churn'],
      dtype='object')
```

In [115…
```
# List of columns you want to plot
columns = ['PhoneService', 'MultipleLines', 'InternetService', 'OnlineSecurity',
           'OnlineBackup', 'DeviceProtection', 'TechSupport',
           'StreamingTV', 'StreamingMovies']

# Step 1: Set up the figure and axes
fig, axes = py.subplots(nrows=3, ncols=3, figsize=(15, 12))  # Create a 3x3 grid of s
fig.tight_layout(pad=5.0)  # Add some space between the plots

# Step 2: Iterate through columns and create a countplot for each
for col, ax in zip(columns, axes.flatten()):  # Flatten the axes array for easy itera
    sns.countplot(data=data, x=col, palette="rocket", ax=ax, hue = data["Churn"])
    ax.set_title(f'Count of {col}', fontsize=12)

# Step 3: Display the plots
py.show()
```



> Churn rates are notably higher for customers using fiber optic internet and for those lacking online security, backup, or tech support services. This suggests that customers without certain protective services or with fiber optic internet are more prone to churn.

Churn by Payment Method :

In [117…
```
data.head(2)
```

Out[117]:

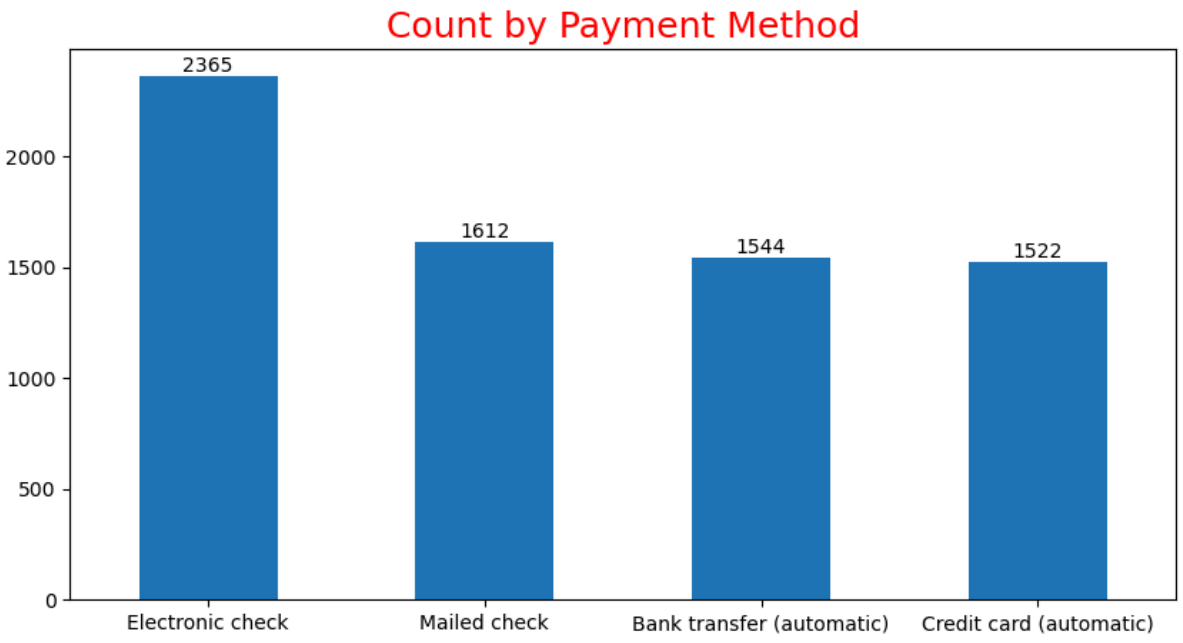
	customerID	gender	SeniorCitizen	Partner	Dependents	tenure	PhoneService	MultipleLines	In
0	7590-VHVEG	Female	no	Yes	No	1	No	No phone service	
1	5575-GNVDE	Male	no	No	No	34	Yes	No	

2 rows × 21 columns

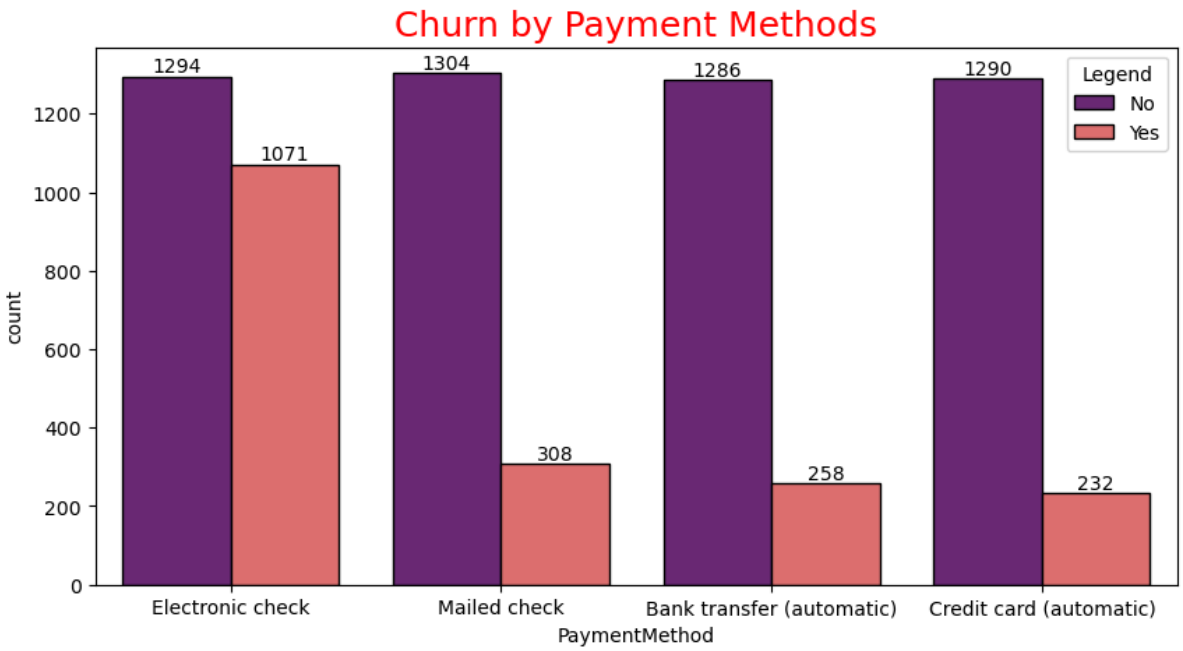
In [118…
```
data.columns
```

Out[118]:
```
Index(['customerID', 'gender', 'SeniorCitizen', 'Partner', 'Dependents',
       'tenure', 'PhoneService', 'MultipleLines', 'InternetService',
       'OnlineSecurity', 'OnlineBackup', 'DeviceProtection', 'TechSupport',
       'StreamingTV', 'StreamingMovies', 'Contract', 'PaperlessBilling',
       'PaymentMethod', 'MonthlyCharges', 'TotalCharges', 'Churn'],
      dtype='object')
```

In [123…
```
py.figure(figsize = (10,5))

ax7 = data["PaymentMethod"].value_counts().plot(kind="bar")
ax7.bar_label(ax7.containers[0])
py.title("Count by Payment Method" , fontsize = 18 , color = "red")
py.xticks(rotation = 0)

py.show()
```



In [136…
```
py.figure(figsize = (10,5))

ax8 = sns.countplot(data = data , x = "PaymentMethod" , hue = "Churn", palette = "mag
ax8.bar_label(ax8.containers[0])
ax8.bar_label(ax8.containers[1])

py.legend(title="Legend" , bbox_to_anchor = (1,1))
py.title("Churn by Payment Methods" , fontsize = 18 , color = "red")

py.show()
```



> Customer is likely to churn when, he is using Electronic Check method

In [ ]: