

CHURN CUSTOMER RETENTION ANALYSIS

```
In [182... import pandas as pd
```

```
In [183... churn_df = pd.read_csv('Churn_Dataset.csv')
```

```
In [184... churn_df
```

```
Out[184]:
```

	customerID	gender	SeniorCitizen	Partner	Dependents	tenure	PhoneService	MultipleLines
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
...
7038	6840-RESVB	Male	0	Yes	Yes	24	Yes	Yes
7039	2234-XADUH	Female	0	Yes	Yes	72	Yes	Yes
7040	4801-JAZZL	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

7043 rows × 23 columns

```
In [185... # Total Customer
```

```
In [186... len(churn_df)
```

```
Out[186]: 7043
```

In []:

In [187... churn_df['Churn'].value_counts().get('Yes')

Out[187]: 1869

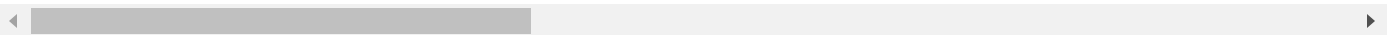
In [188... filtered_data = churn_df[churn_df['Churn'] == 'Yes']

In [189... filtered_data

Out[189]:

	customerID	gender	SeniorCitizen	Partner	Dependents	tenure	PhoneService	MultipleLines
2	3668-QPYBK	Male	0	No	No	2	Yes	No
4	9237-HQITU	Female	0	No	No	2	Yes	No
5	9305-CDSKC	Female	0	No	No	8	Yes	Yes
8	7892-POOKP	Female	0	Yes	No	28	Yes	Yes
13	0280-XJGEX	Male	0	No	No	49	Yes	Yes
...
7021	1699-HPSBG	Male	0	No	No	12	Yes	No
7026	8775-CEBBJ	Female	0	No	No	9	Yes	No
7032	6894-LFHLY	Male	1	No	No	1	Yes	Yes
7034	0639-TSIQW	Female	0	No	No	67	Yes	Yes
7041	8361-LTMKD	Male	1	Yes	No	4	Yes	Yes

1869 rows × 23 columns



In []: # Total Number with 'Yes' Churn

In [190... len(filtered_data)

Out[190]: 1869

In []:

In []: *# Numbers with Admin. Ticket*

In [191... sum_of_admin_ticket = filtered_data['numAdminTickets'].sum()

In [192... sum_of_admin_ticket

Out[192]: 885

In []:

In []: *# Numbers with Tech. Ticket*

In [193... sum_of_tech_ticket = filtered_data['numTechTickets'].sum()

In [194... sum_of_tech_ticket

Out[194]: 2173

In []:

In []: *# Total Monthly Charges*

In [195... sum_of_MonthlyCharges = filtered_data['MonthlyCharges'].sum()

In [196... sum_of_MonthlyCharges

Out[196]: 139130.85

In []:

Demographics Information

In [197... *# Those with Dependants*

In [198... Dependents = filtered_data['Dependents'].value_counts()

In [199... Dependents

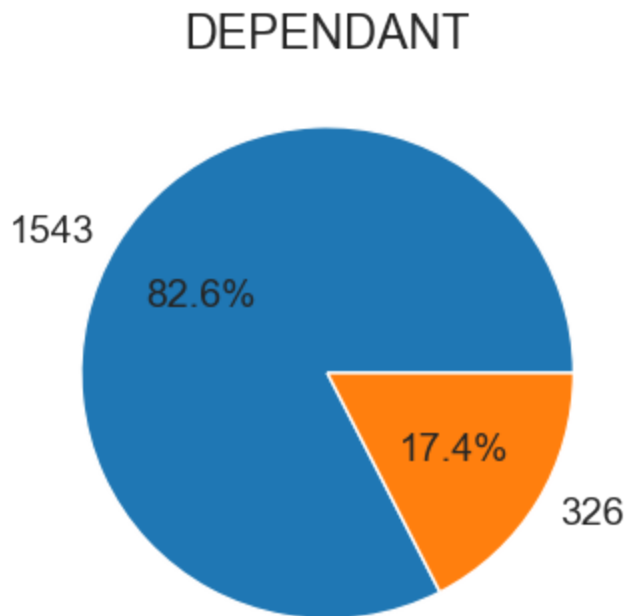
Out[199]: Dependents
No 1543
Yes 326
Name: count, dtype: int64

In [200... **import** numpy **as** np
import seaborn **as** sns
import matplotlib

```
import matplotlib.pyplot as plt
%matplotlib inline
```

```
In [201... sns.set_style('darkgrid')
matplotlib.rcParams['font.size'] = 14
matplotlib.rcParams['figure.figsize'] = (9, 5)
matplotlib.rcParams['figure.facecolor'] = '#00000000'
```

```
In [202... plt.figure(figsize=(4,4))
plt.title('DEPENDANT')
plt.pie(Dependents, labels=Dependents, autopct='%1.1f%%');
```



In []:

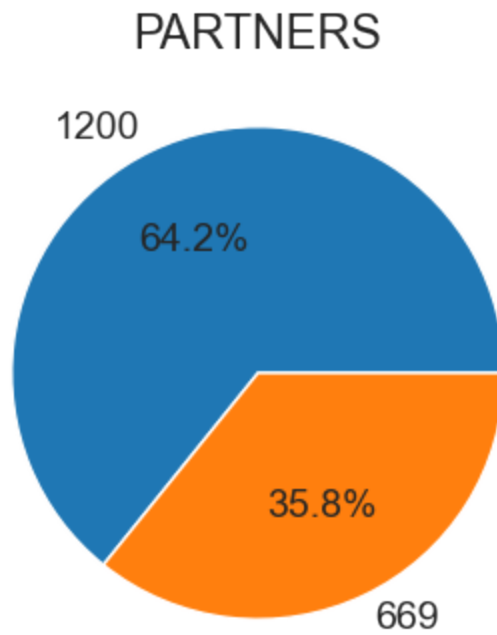
```
In [203... # Those with Partners
```

```
In [204... Partners = filtered_data['Partner'].value_counts()
```

```
In [205... Partners
```

```
Out[205]: Partner
No      1200
Yes      669
Name: count, dtype: int64
```

```
In [206... plt.figure(figsize=(4,4))
plt.title('PARTNERS')
plt.pie(Partners, labels=Partners, autopct='%1.1f%%');
```



In []:

In [207... *# The Senior Citizen*

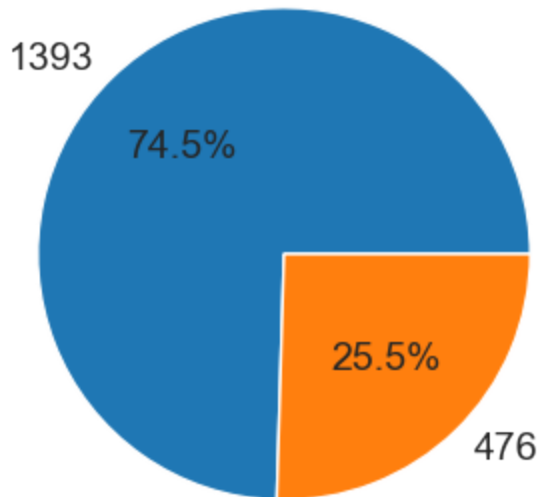
In [208... `SeniorCitizen = filtered_data['SeniorCitizen'].value_counts()`

In [209... `SeniorCitizen`

Out[209]: `SeniorCitizen`
0 1393
1 476
Name: count, dtype: int64

In [210... `plt.figure(figsize=(4,4))`
`plt.title('SENIOR CITIZEN')`
`plt.pie(SeniorCitizen, labels=SeniorCitizen, autopct='%1.1f%%');`

SENIOR CITIZEN

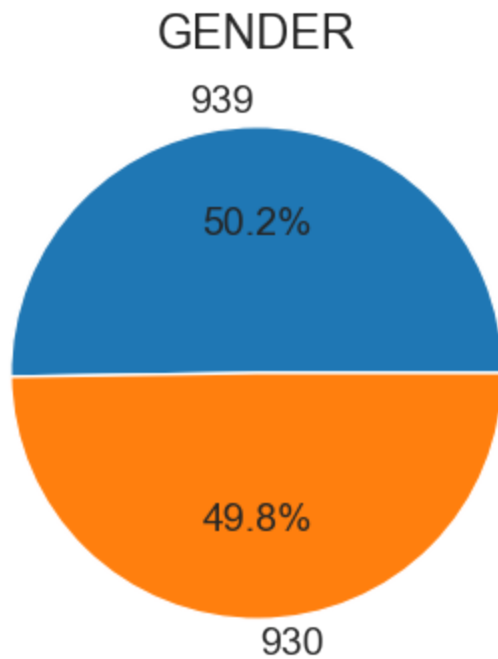


In []:

In [211... `# Gender`In [212... `gender = filtered_data['gender'].value_counts()`In [213... `gender`

```
Out[213]: gender
Female    939
Male      930
Name: count, dtype: int64
```

```
In [214... plt.figure(figsize=(4,4))
plt.title('GENDER')
plt.pie(gender, labels=gender, autopct='%1.1f%%');
```



In []:

Customer Account Information

In [215... *# Average charges*In [216... `monthy_average = filtered_data['MonthlyCharges'].mean()`In [217... `monthy_average`

Out[217]: 74.44133226324237

In []:

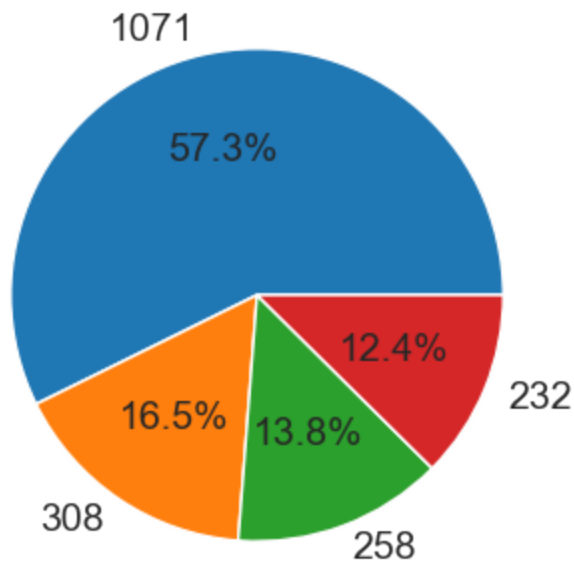
In [218... *# Payment Method*In [219... `payment = filtered_data['PaymentMethod'].value_counts()`In [220... `payment`

Out[220]:

PaymentMethod	
Electronic check	1071
Mailed check	308
Bank transfer (automatic)	258
Credit card (automatic)	232
Name: count, dtype: int64	

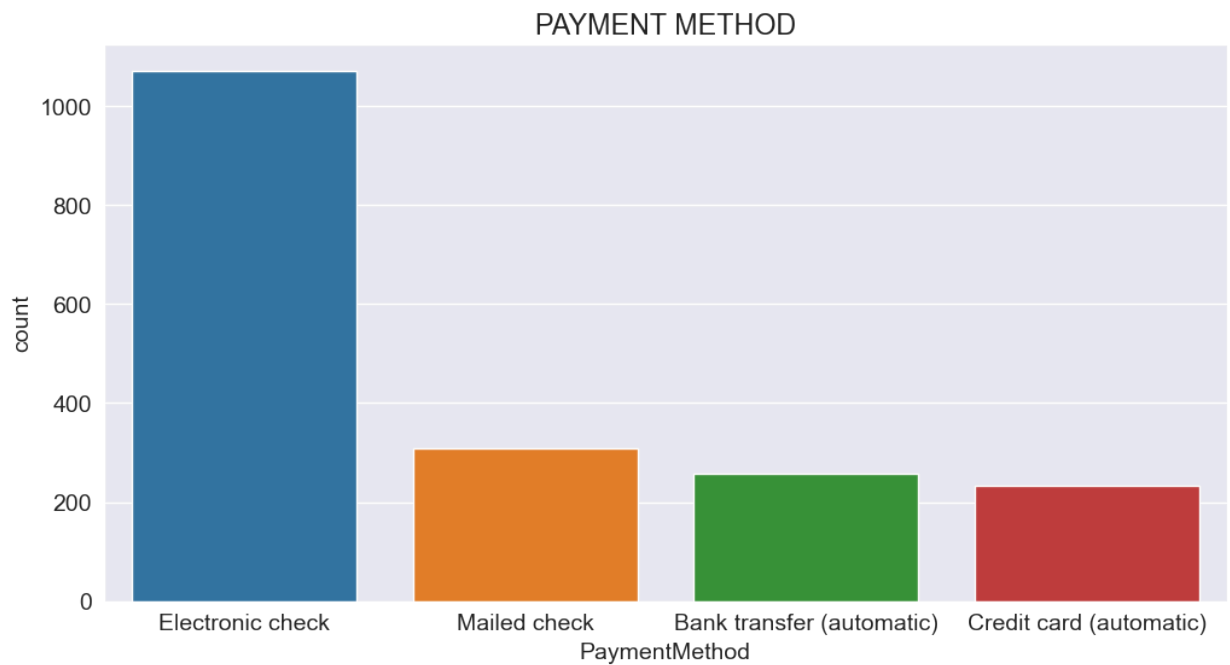
In [221... `plt.figure(figsize=(4,4))`
`plt.title('PAYMENT METHOD')`
`plt.pie(payment, labels=payment, autopct='%1.1f%%');`

PAYMENT METHOD



In [222...]

```
plt.figure(figsize=(12,6))  
plt.title('PAYMENT METHOD')  
sns.barplot(x=payment.index, y=payment);
```



In []:

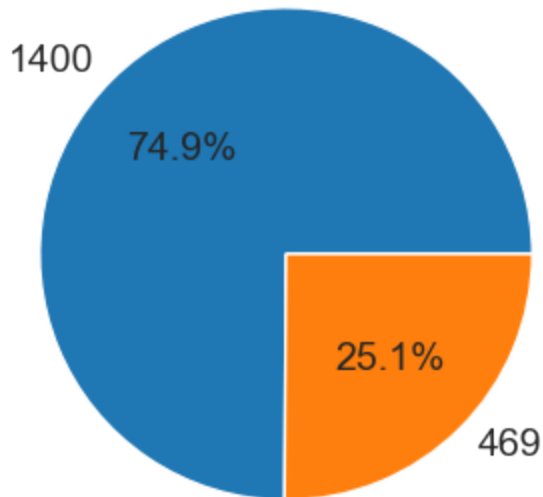
In []:

Paperless Billing

In [223...]

```
plt.figure(figsize=(4,4))  
plt.title('PAPERLESS BILLING')  
plt.pie(PaperlessBilling, labels=PaperlessBilling, autopct='%1.1f%%');
```


PAPERLESS BILLING



In []:

In [224... *# Type of Contract*

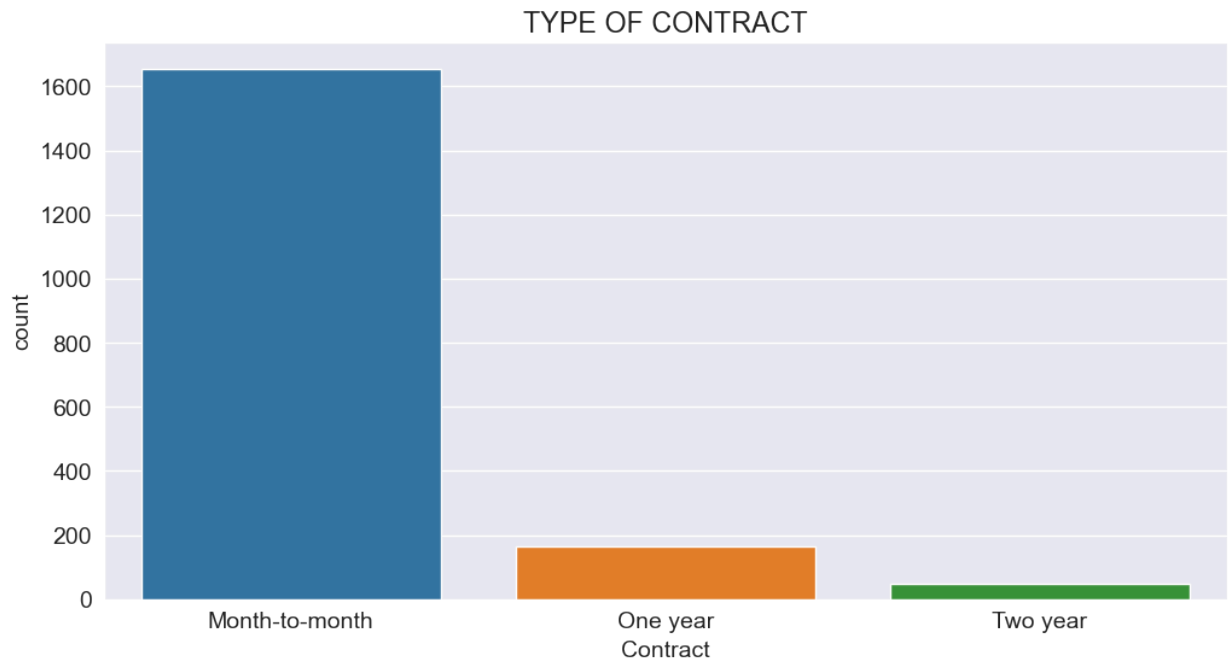
In [225... `Contract = filtered_data['Contract'].value_counts()`

In [226... `Contract`

Out[226]:

Contract	
Month-to-month	1655
One year	166
Two year	48
Name: count, dtype: int64	

In [227... `plt.figure(figsize=(12,6))`
`plt.title('TYPE OF CONTRACT')`
`sns.barplot(x=Contract.index, y=Contract);`



In []:

Services Customers Sign Up For

In [228... `total_customer = len(filtered_data)`In [229... `total_customer`

Out[229]: 1869

In [230... `# Percentage of Phone Services`In [231... `No_of_phone_services = (filtered_data['PhoneService'] == 'Yes').sum()`In [232... `No_of_phone_services`

Out[232]: 1699

In [233... `No_of_phone_services * 100 / total_customer`

Out[233]: 90.90422685928304

In []:

In [234... `# Percentage of Streaming TV`In [235... `(filtered_data['StreamingTV'] == 'Yes').sum() * 100 / total_customer`

Out[235]: 43.55270197966827

In []:

In [236... *# Percentage of Streaming Movies*

```
(filtered_data['StreamingMovies'] == 'Yes').sum() * 100 / total_customer
```

Out[237]: 43.76672017121455

In []:

In [238... *# Percentage of Device Protection*

```
(filtered_data['DeviceProtection'] == 'Yes').sum() * 100 / total_customer
```

Out[239]: 29.159978598180846

In []:

In [240... *# Percentage of Online Backup*

```
(filtered_data['OnlineBackup'] == 'Yes').sum() * 100 / total_customer
```

Out[241]: 27.982878544676296

In []:

In [242... *# Percentage of Tech Support*

```
(filtered_data['TechSupport'] == 'Yes').sum() * 100 / total_customer
```

Out[243]: 16.586409844836812

In []:

In [244... *# Percentage of Online Security*

```
(filtered_data['OnlineSecurity'] == 'Yes').sum() * 100 / total_customer
```

Out[245]: 15.783841626538257

In []:

In [246... *# Percentage with multiple lines*

```
(filtered_data['MultipleLines'] == 'Yes').sum() * 100 / total_customer
```

Out[247]: 45.4788657035848

In []:

In [248... *# Percentage without multiple lines*

```
(filtered_data['MultipleLines'] == 'No').sum() * 100 / total_customer
```

Out[249]: 45.42536115569823

In []:

In [250... *# Percentage with Internet Services*

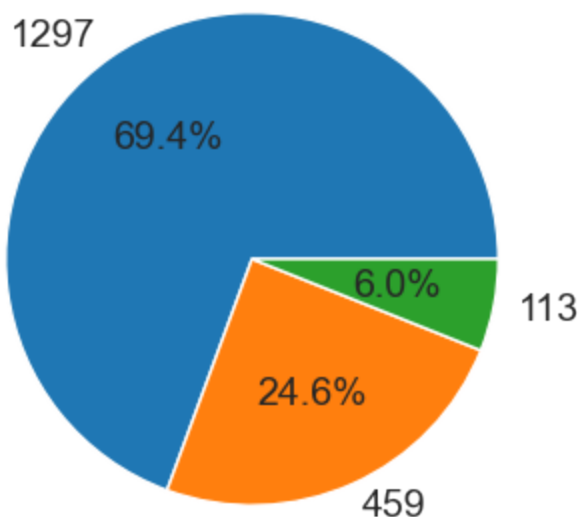
In [251... `InternetService = filtered_data['InternetService'].value_counts()`

In [252... `InternetService`

Out[252]: `InternetService`
Fiber optic 1297
DSL 459
No 113
Name: count, dtype: int64

In [253... `plt.figure(figsize=(4,4))`
`plt.title('INTERNET SERVICES')`
`plt.pie(InternetService, labels=InternetService, autopct='%1.1f%%');`

INTERNET SERVICES



In []:

In [254... *# Percentage of Churn rate*

In [257... `churn_rate = total_customer * 100 / len(churn_df)`

In [258... `churn_rate`

Out[258]: 26.536987079369588

In []:

In []:

In []: