Untitled-1

```python
1   # %%
2   !pip install pandas
3
4
5   # %%
6   !pip install matplotlib
7   !pip install seaborn
8   !pip install numpy
9
10  # %%
11  import pandas as pd
12  import numpy as np
13  import seaborn as sns
14  import matplotlib.pyplot as plt
15  df = pd.read_csv("customer_churn.csv")
16  df.head()
17
18  # %%
19  df.info()
20
21  # %%
22  df['TotalCharges'] = df['TotalCharges'].replace(" ","0")
23  df['TotalCharges'] = df['TotalCharges'].astype("float")
24
25  # %%
26  df.info()
27
28  # %%
29  df.isnull().sum().sum()
30
31  # %%
32  df.describe()
33
34  # %%
35  df.duplicated().sum()
36
37  # %%
38  df["customerID"].duplicated().sum()
39
40  # %%
41  def conv(value):
42      if value == 1:
43          return "yes"
44      else:
45          return "no"
46  df["SeniorCitizen"]=df["SeniorCitizen"].apply(conv)
47
48  # %%
```

```python
49  df.tail()
50
51  # %%
52
53
54  ax =sns.countplot(x="Churn", data=df)
55  ax.bar_label(ax.containers[0])
56  plt.show()
57
58  # %%
59  gb=df.groupby("Churn").agg({"Churn":"count"})
60  plt.figure(figsize=(3,3))
61  plt.pie(gb["Churn"], labels=gb.index, autopct ="%1.2f%%")
62  plt.title("Percentage of Churn Customers", fontsize=10)
63
64  plt.show()
65
66
67  # %%
68  plt.figure(figsize=(4,4))
69  sns.countplot(x="gender", data=df , hue="Churn")
70  plt.title("churn By Gender")
71  plt.show()
72
73  # %%
74  plt.figure(figsize=(4,4))
75  sns.countplot(x="SeniorCitizen", data=df , hue="Churn")
76  plt.title("churn By SeniorCitizen")
77  plt.show()
78
79  # %% [markdown]
80  # #on the basis of senior citizen there is more churned out
81  #
82
83  # %%
84  sns.histplot(x="tenure", data=df, hue="Churn", bins=72)
85  plt.show()
86
87  # %% [markdown]
88  # #people who have used our services fro long time stayed while people who have used our
        services for one-two months have churned out
89
90  # %%
91  plt.figure(figsize=(4,4))
92  ax=sns.countplot(x="Contract",data=df,hue="Churn")
93  ax.bar_label(ax.containers[0])
94  plt.title("Count of customers by Contract")
95  plt.show()
96
97  # %% [markdown]
```

```python
98   # #people who have month to month contract are likely to churn then who have one or two month
     of contract
99
100  # %%
101  df.columns.values
102
103  # %%
104  # import pandas as pd
105  # import seaborn as sns
106  # import matplotlib.pyplot as plt
107
108  cols = ['PhoneService', 'MultipleLines', 'InternetService',
109          'OnlineSecurity', 'OnlineBackup', 'DeviceProtection',
110          'TechSupport', 'StreamingTV', 'StreamingMovies'
111          ]
112
113  n_cols = 3
114  n_rows = int(len(cols) / n_cols) + (len(cols) % n_cols > 0)
115
116  fig, axs = plt.subplots(n_rows, n_cols, figsize=(5 * n_cols, 4 * n_rows))
117  axs = axs.flatten()
118
119  for i, col in enumerate(cols):
120      sns.countplot(data=df, x=col, ax=axs[i], hue="Churn")
121      axs[i].set_title(col)
122      axs[i].set_xlabel('')
123      axs[i].set_ylabel('Count')
124      axs[i].tick_params(axis='x')
125
126  # Hide any unused subplots
127  for j in range(i + 1, len(axs)):
128      axs[j].axis('off')
129
130  plt.tight_layout()
131  plt.show()
132
133
134  # %% [markdown]
135  # #People using fiber-optic internet were more likely to leave than those using DSL or no
     internet.
136  #
137  # People who had extra services — like online security, backup, device protection, or tech
     support — stayed more often.
138  #
139  # Having fewer or no of those extra services was linked with higher chance of leaving.
140  #
141  # Simple takeaway: More services (especially protection/support extras) → less churn. Fiber-
     optic internet alone (maybe because it's more expensive) → more churn.
142
143  # %%
144  plt.figure(figsize=(6,6))
```

```python
145  ax=sns.countplot(x="PaymentMethod",data=df,hue="Churn")
146  ax.bar_label(ax.containers[0])
147  plt.xticks(rotation=45)
148  plt.title("Churn By Payment Method")
149  plt.show()
150
151  # %% [markdown]
152  # #customer is likely to churn when they are using Electronic check as a Payment method
153
154  # %% [markdown]
155  #
156
157
158
```