Import Library + Load Data

```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns

df = pd.read_csv('data_pelanggan_indosat.csv')

df.head()
```

```
                      Nama        No_HP      Kota           Paket
Tgl_beli  \
0  Balidin Dongoran, S.T.  857          Surabaya  Freedom Combo  2024-
10-08
1            Okto Jailani  814           Jakarta  Freedom Combo  2025-
03-15
2     R. Lantar Anggraini  814             Medan  Freedom Combo  2024-
07-22
3        Darimin Pradipta  814           Semarang  Unlimited 2GB  2025-
01-11
4        Kanda Napitupulu  856          Surabaya         Yellow  2025-
03-30

   Durasi_Bulan  Frekuensi_Topup  Kuota_Bulan_GB
0             9                5              16
1             4                1               7
2            12                2              20
3             2                3               5
4            12                1               1
```

Hitung Churn Rate Customer

```
# mengetahui churn rate
# Frekuensi_Topup ≤ 1 dalam 3+ bulan → dianggap churn
df['Churn'] = ((df['Frekuensi_Topup'] <= 1) & (df['Durasi_Bulan'] >=
3))
# hitung churn
churn_rate = df['Churn'].sum() / len(df) * 100
print(f'Hasil Persentase Churn Rate Customer: {churn_rate:.2f}%')
```

```
Hasil Persentase Churn Rate Customer: 22.50%
```

Tampilkan Dalam Grafik

```
# Buat pie chart churn vs aktif
churn_counts = df['Churn'].value_counts()
labels = ['User Aktif', 'User Churn']
sizes = [churn_counts[0], churn_counts[1]]
colors = ['#FFD500', '#ED1C24']
```

```
plt.figure(figsize=(6, 6))
plt.pie(sizes, labels=labels, autopct='%1.1f%%',
colors=colors)
plt.title('Distribusi Churn vs Aktif Pelanggan Indosat')
plt.axis('equal')
```

```
/tmp/ipykernel_552506/2240223363.py:4: FutureWarning:
Series.__getitem__ treating keys as positions is deprecated. In a
future version, integer keys will always be treated as labels
(consistent with DataFrame behavior). To access a value by position,
use `ser.iloc[pos]`
  sizes = [churn_counts[0], churn_counts[1]]
```

```
(np.float64(-1.0999999318335567),
 np.float64(1.0999999967539789),
 np.float64(-1.0999998974046947),
 np.float64(1.0999999790110455))
```