# PROJECT TITLE:

Customer Churn Analysis and Prediction

# DESCRIPTION:

A data-driven machine learning project that identifies key factors behind customer churn in a telecom company.The project aims to analyse patterns and predict whether a customer is likely to leave the company, helping the business make informed decisions to reduce churn.

# FEATURES:

1. Data cleaning, handling missing values, and encoding.
2. Exploratory Data Analysis (EDA) to find insights using visualisations.
3. Feature selection and transformation.
4. Machine learning model building and evaluation.
5. Churn prediction using the best-performing model

# TECHNOLOGIES USED:

1. Python
2. Pandas, NumPy
3.Matplotlib, Seaborn

# Tasks 3: Customer Segmentation

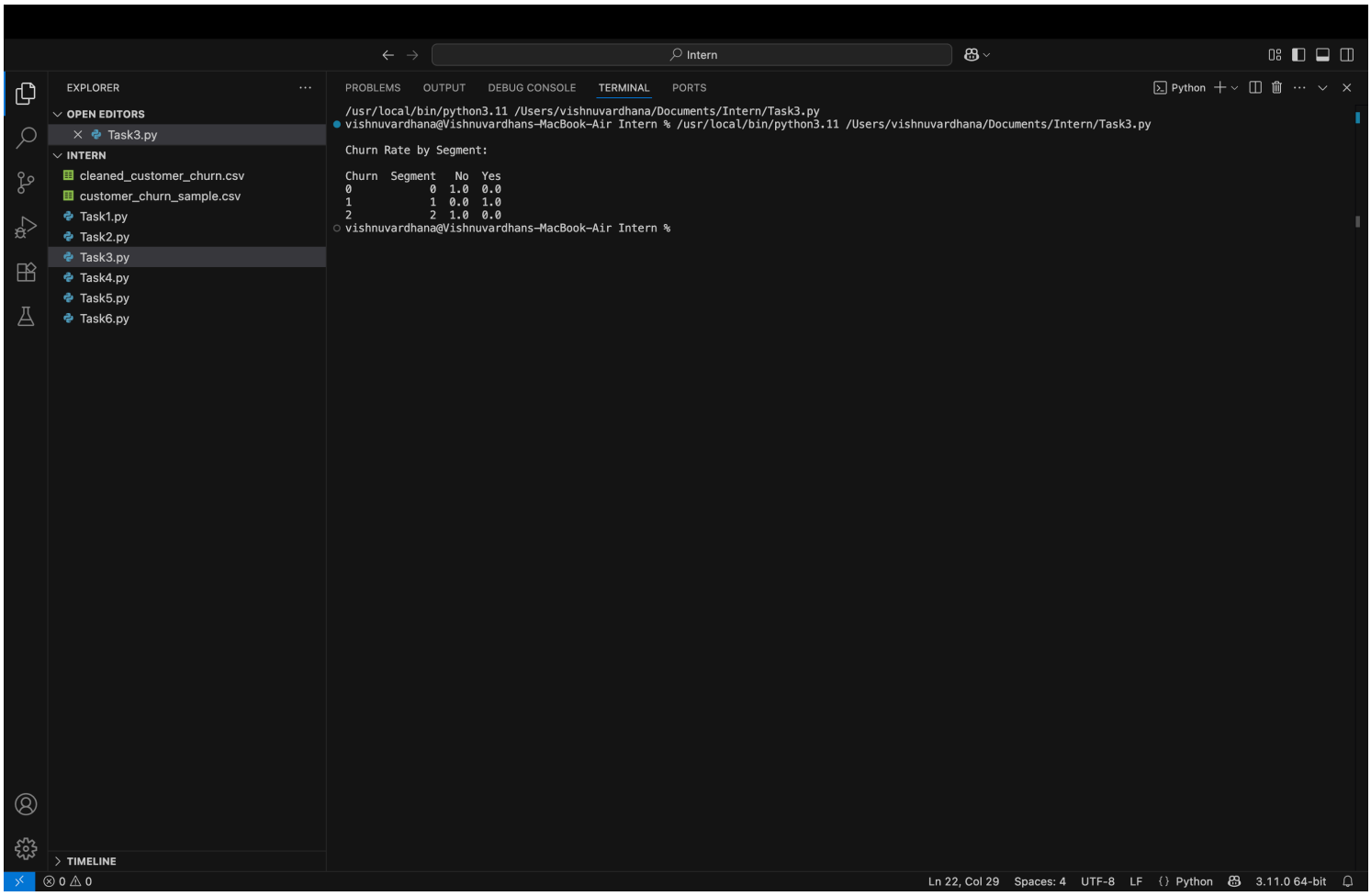
## DESCRIPTION:

Segment customers based on tenure, monthly charges, and contract type, then analyse how churn rates vary across these segments to identify patterns and insights about customer behaviour.

## Code Snippet:

```
import pandas as pd
from sklearn.cluster import KMeans
from sklearn.preprocessing import LabelEncoder
df = pd.read_csv("cleaned_customer_churn.csv")
def get_contract(row):
    if row['Contract_Two year']==1:
        return 'Two year'
    elif row['Contract_One year']==1:
        return 'One year'
    else:
        return 'Month-to-Month'
df['Contract']=df.apply(get_contract,axis=1)
df['Churn']=df['Churn_Yes'].apply(lambda x:'Yes' if x==1 else 'No')
contract_map={'Month-to-Month':0 , 'One year':1 , 'Two year':2}
df['Contract_encoded']=df['Contract'].map(contract_map)
X=df[['tenure','MonthlyCharges','Contract_encoded']]
Kmeans = KMeans(n_clusters=3, random_state=42, n_init=10)
df['Segment']=Kmeans.fit_predict(X)
churn_analysis=df.groupby('Segment')
['Churn'].value_counts(normalize=True).unstack().fillna(0)
churn_analysis_output=churn_analysis.round(3).reset_index()
print("\nChurn Rate by Segment:\n")
print(churn_analysis_output)
```

# OUTPUT:


Intern
EXPLORER
OPEN EDITORS
Task3.py
INTERN
cleaned_customer_churn.csv
customer_churn_sample.csv
Task1.py
Task2.py
Task3.py
Task4.py
Task5.py
Task6.py
TIMELINE
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
Python
/usr/local/bin/python3.11 /Users/vishnuvardhana/Documents/Intern/Task3.py
vishnuvardhana@Vishnuvardhans-MacBook-Air Intern % /usr/local/bin/python3.11 /Users/vishnuvardhana/Documents/Intern/Task3.py
Churn Rate by Segment:
Churn Segment No Yes
0 0 1.0 0.0
1 1 0.0 1.0
2 2 1.0 0.0
vishnuvardhana@Vishnuvardhans-MacBook-Air Intern %
0 0
Ln 22, Col 29
Spaces: 4
UTF-8
LF
Python
3.11.0 64-bit