Install + Imports

```
!pip install seaborn

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

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Requirement already satisfied: seaborn in /usr/local/lib/python3.11/dist-packages (0.13.2)
Requirement already satisfied: numpy!=1.24.0,>=1.20 in /usr/local/lib/python3.11/dist-packages (from seaborn) (2.0.2)
Requirement already satisfied: pandas>=1.2 in /usr/local/lib/python3.11/dist-packages (from seaborn) (2.2.2)
Requirement already satisfied: matplotlib!=3.6.1,>=3.4 in /usr/local/lib/python3.11/dist-packages (from seaborn) (3.10.0)
Requirement already satisfied: contourpy>=1.0.1 in /usr/local/lib/python3.11/dist-packages (from matplotlib!=3.6.1,>=3.4->seaborn) (1.3.
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Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.11/dist-packages (from python-dateutil>=2.7->matplotlib!=3.6.1,>=3.4->
```

Load Dataset

```
df = pd.read_csv('/content/ecommerce_rfm_data.csv')
df['InvoiceDate'] = pd.to_datetime(df['InvoiceDate'])
df.head()
```

	CustomerID	InvoiceDate	InvoiceNo	Quantity	UnitPrice	Country
0	10102	2023-01-05	270456	9	35.274140	USA
1	10435	2023-01-02	219585	2	43.938992	Germany
2	10348	2023-01-22	217272	7	65.237321	UK
3	10270	2023-04-22	226619	5	7.290625	USA
4	10106	2023-02-26	275069	3	90.287540	France

Clean + Add TotalAmount

```
df = df[(df['Quantity'] > 0) & (df['UnitPrice'] > 0)]
df['TotalAmount'] = df['Quantity'] * df['UnitPrice']
```

RFM Calculation

```
ref_date = df['InvoiceDate'].max() + dt.timedelta(days=1)

rfm = df.groupby('CustomerID').agg({
    'InvoiceDate': lambda x: (ref_date - x.max()).days,
    'InvoiceNo': 'nunique',
    'TotalAmount': 'sum'
}).reset_index()

rfm.columns = ['CustomerID', 'Recency', 'Frequency', 'Monetary']
```

Score RFM

```
rfm['R'] = pd.qcut(rfm['Recency'], 5, labels=[5,4,3,2,1]).astype(int)
rfm['F'] = pd.qcut(rfm['Frequency'].rank(method='first'), 5, labels=[1,2,3,4,5]).astype(int)
rfm['M'] = pd.qcut(rfm['Monetary'], 5, labels=[1,2,3,4,5]).astype(int)

rfm['RFM_Score'] = rfm['R'].astype(str) + rfm['F'].astype(str) + rfm['M'].astype(str)
```

Define Segments

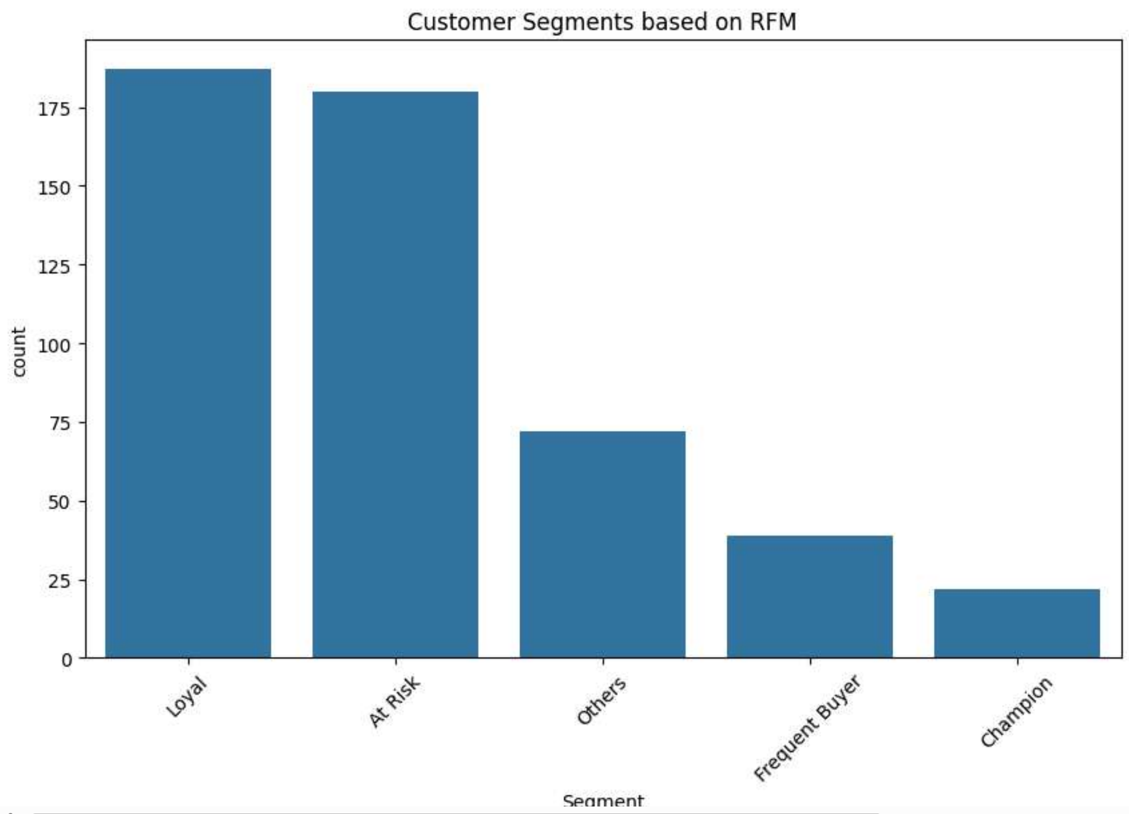
```
def segment_customer(row):
    score = row['RFM_Score']
    if score == '555':
        return 'Champion'
    elif row['R'] >= 4:
        return 'Loyal'
    elif row['F'] == 5:
        return 'Frequent Buyer'
    elif row['R'] <= 2:
        return 'At Risk'
    else:
        return 'Others'

rfm['Segment'] = rfm.apply(segment_customer, axis=1)
rfm.head()
```

	CustomerID	Recency	Frequency	Monetary	R	F	M	RFM_Score	Segment
0	10000	11	11	3764.395964	5	4	5	545	Loyal
1	10001	26	7	2021.522949	4	2	3	423	Loyal
2	10002	49	9	1245.299235	2	3	1	231	At Risk
3	10003	2	9	2078.881238	5	3	3	533	Loyal
4	10004	25	12	3617.649036	4	5	5	455	Loyal

Visualize Segments

```
plt.figure(figsize=(10,6))
sns.countplot(data=rfm, x='Segment', order=rfm['Segment'].value_counts().index)
plt.title("Customer Segments based on RFM")
plt.xticks(rotation=45)
plt.show()
```



export

```
rfm.to_csv("RFM_Customer_Segments.csv", index=False)
```