

```
import pandas as pd

import matplotlib.pyplot as plt

import seaborn as sns


customers = pd.read_csv("Customers.csv")
products = pd.read_csv("Products.csv")
transactions = pd.read_csv("Transactions.csv")


transactions = transactions.merge(products, on="ProductID", how="left")
merged_data = transactions.merge(customers, on="CustomerID", how="left")


merged_data["TransactionDate"] = pd.to_datetime(merged_data["TransactionDate"])
customers["SignupDate"] = pd.to_datetime(customers["SignupDate"])


category_revenue =
merged_data.groupby("Category")["TotalValue"].sum().sort_values(ascending=False)

plt.figure(figsize=(8, 5))

category_revenue.plot(kind="bar", color="skyblue", title="Revenue by Product Category")

plt.ylabel("Revenue")

plt.show()


top_customers =
merged_data.groupby("CustomerName")["TotalValue"].sum().sort_values(ascending=False).head(10)

plt.figure(figsize=(8, 5))

top_customers.plot(kind="bar", color="orange", title="Top 10 Customers by Revenue")

plt.ylabel("Revenue")

plt.show()


daily_revenue = merged_data.groupby("TransactionDate")["TotalValue"].sum()

plt.figure(figsize=(10, 5))

daily_revenue.plot(color="green", title="Daily Revenue Trend")

plt.ylabel("Revenue")
```

```
plt.xlabel("Date")
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```
plt.show()
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```
plt.figure(figsize=(8, 5))
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```
sns.histplot(products["Price"], kde=True, color="purple")
```

```
plt.title("Product Price Distribution")
```

```
plt.xlabel("Price")
```

```
plt.ylabel("Frequency")
```

```
plt.show()
```

```
region_revenue = merged_data.groupby("Region")["TotalValue"].sum().sort_values(ascending=False)
```

```
plt.figure(figsize=(8, 5))
```

```
region_revenue.plot(kind="bar", color="red", title="Revenue by Region")
```

```
plt.ylabel("Revenue")
```

```
plt.show()
```

Business Insights

1. **High-Performing Categories:** Categories X, Y, and Z contribute the most to revenue. This suggests prioritizing inventory and marketing efforts on these categories.
2. **Customer Value:** The top 10 customers account for a significant share of revenue. Introducing a loyalty program can boost retention and spending.
3. **Seasonality in Transactions:** Revenue trends reveal seasonal spikes. Tailoring marketing campaigns around these periods can maximize sales.
4. **Price Insights:** Most products are priced within \$X–\$Y, indicating a sweet spot for pricing strategies.
5. **Regional Revenue:** Region A generates the highest revenue. Expanding operations or targeting similar demographics could increase growth.





