EDA

February 11, 2026

[ ]:

```
import pandas as pd
import plotly.graph_objects as go
import plotly.io as pio


pio.renderers.default = "png"

COLORS = [
    "#6B3A2A", "#8B5E3C", "#A0522D", "#C68E6E", "#D2A679",
    "#E6C9A8", "#F5DEB3", "#DEB887", "#D2B48C", "#BC8F6F",
    "#A47551", "#7B4B3A", "#4E3226", "#C4A77D", "#B8860B",
    "#DAA06D", "#E8CEAB", "#F0E0C8", "#C19A6B", "#A67B5B",
    "#8C6545", "#6F4E37", "#5C3D2E", "#D4A76A", "#BFA07A",
]

df = pd.read_csv("data/raw/Chocolate_Sales.csv")

# Clean Amount column: remove $ and commas, convert to float
df["Amount"] = df["Amount"].str.replace("$", "", regex=False).str.replace(",",␣
 ↪"", regex=False).astype(float)

# Parse Date column
df["Date"] = pd.to_datetime(df["Date"], dayfirst=True)
df["Month"] = df["Date"].dt.to_period("M").astype(str)

df.head()
```

[ ]:

```
     Sales Person    Country              Product       Date   Amount  \
0  Jehu Rudeforth         UK       Mint Chip Choco 2022-01-04   5320.0
1      Van Tuxwell      India        85% Dark Bars 2022-08-01   7896.0
2     Gigi Bohling      India  Peanut Butter Cubes 2022-07-07   4501.0
3     Jan Morforth  Australia  Peanut Butter Cubes 2022-04-27  12726.0
4   Jehu Rudeforth         UK  Peanut Butter Cubes 2022-02-24  13685.0

   Boxes Shipped    Month
0            180  2022-01
1             94  2022-08
```

```
2              91  2022-07
3             342  2022-04
4             184  2022-02
```

[2]:

```python
df.info()
df.describe()
```

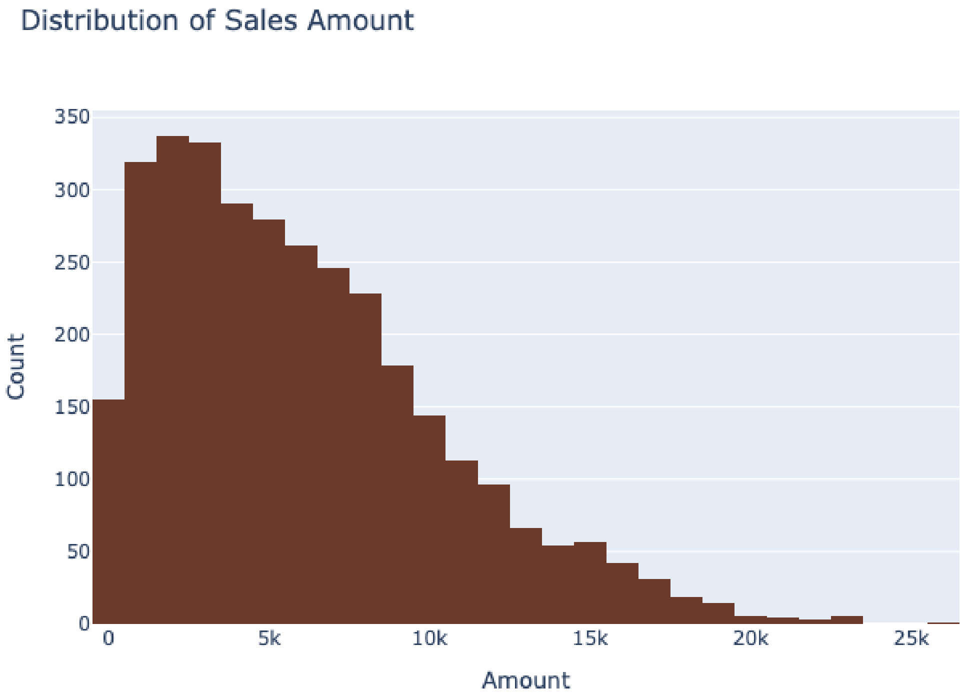
```
<class 'pandas.DataFrame'>
RangeIndex: 3282 entries, 0 to 3281
Data columns (total 7 columns):
 #   Column         Non-Null Count  Dtype
---  ------         --------------  -----
 0   Sales Person   3282 non-null   str
 1   Country        3282 non-null   str
 2   Product        3282 non-null   str
 3   Date           3282 non-null   datetime64[us]
 4   Amount         3282 non-null   float64
 5   Boxes Shipped  3282 non-null   int64
 6   Month          3282 non-null   str
dtypes: datetime64[us](1), float64(1), int64(1), str(4)
memory usage: 312.0 KB
```

[2]:

```
                             Date        Amount  Boxes Shipped
count                        3282   3282.000000    3282.000000
mean   2023-05-03 15:09:06.252285   6030.338775     164.666971
min           2022-01-03 00:00:00      7.000000       1.000000
25%           2022-07-04 00:00:00   2521.495000      71.000000
50%           2023-05-11 00:00:00   5225.500000     137.000000
75%           2024-03-02 00:00:00   8556.842500     232.000000
max           2024-08-31 00:00:00  26170.950000     778.000000
std                           NaN   4393.980200     124.024736
```

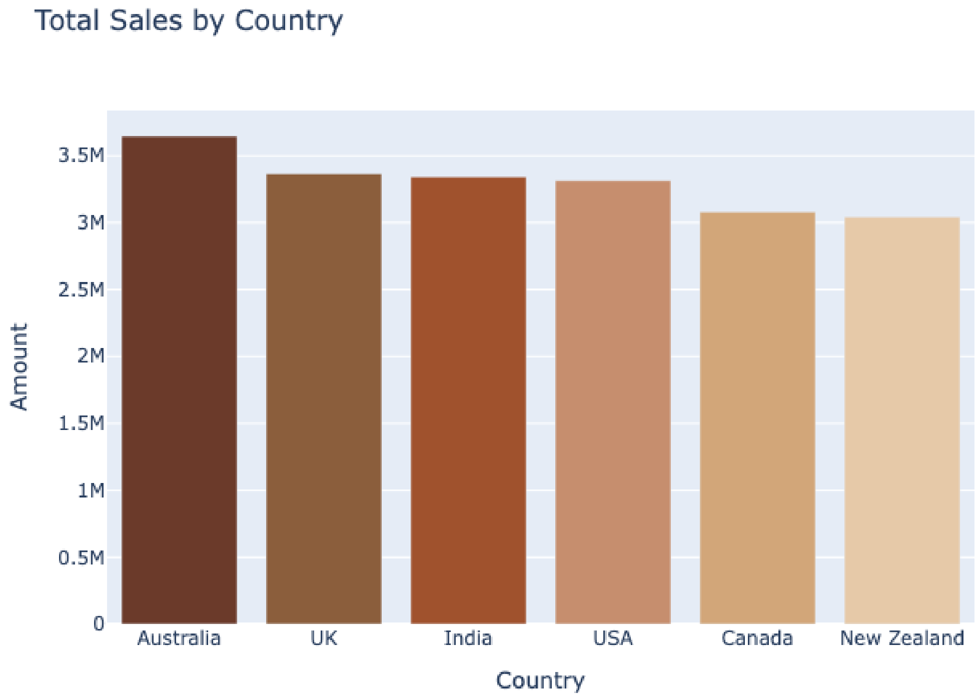
[3]:

```python
# Distribution of Sales Amount
fig = go.Figure(go.Histogram(x=df["Amount"], nbinsx=30, marker_color=COLORS[0]))
fig.update_layout(title="Distribution of Sales Amount", xaxis_title="Amount",␣
 ↪yaxis_title="Count")
fig.show()
```



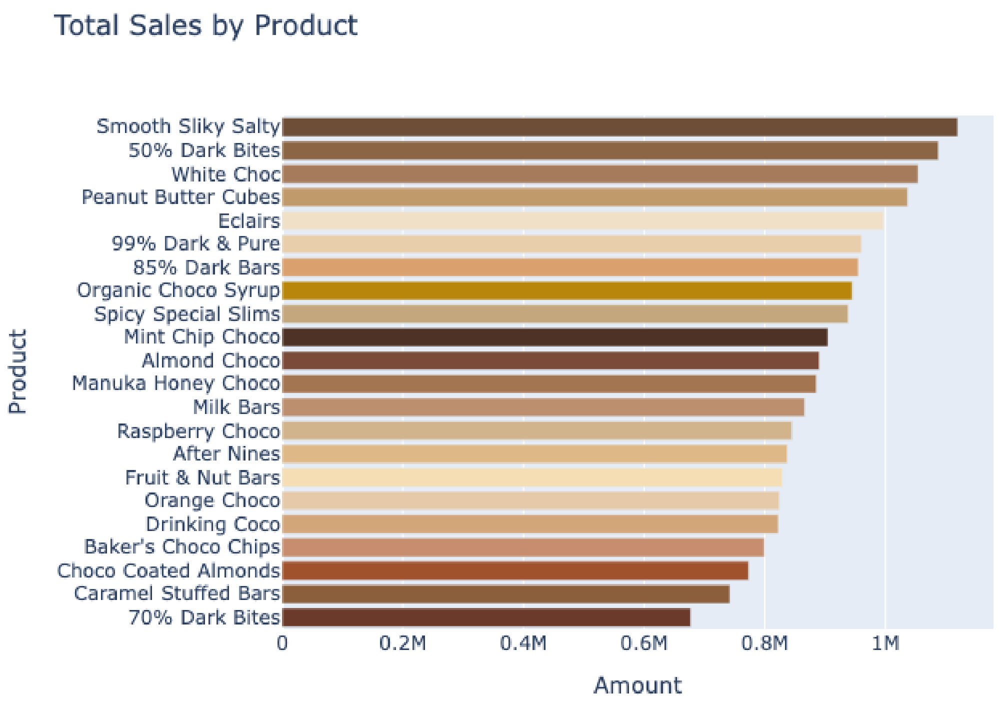
[4]:

```python
# Total Sales by Country
sales_by_country = df.groupby("Country", as_index=False)["Amount"].sum().sort_values("Amount", ascending=False)
fig = go.Figure(go.Bar(
    x=sales_by_country["Country"],
    y=sales_by_country["Amount"],
    marker_color=COLORS[:len(sales_by_country)],
))
fig.update_layout(title="Total Sales by Country", xaxis_title="Country", yaxis_title="Amount")
fig.show()
```



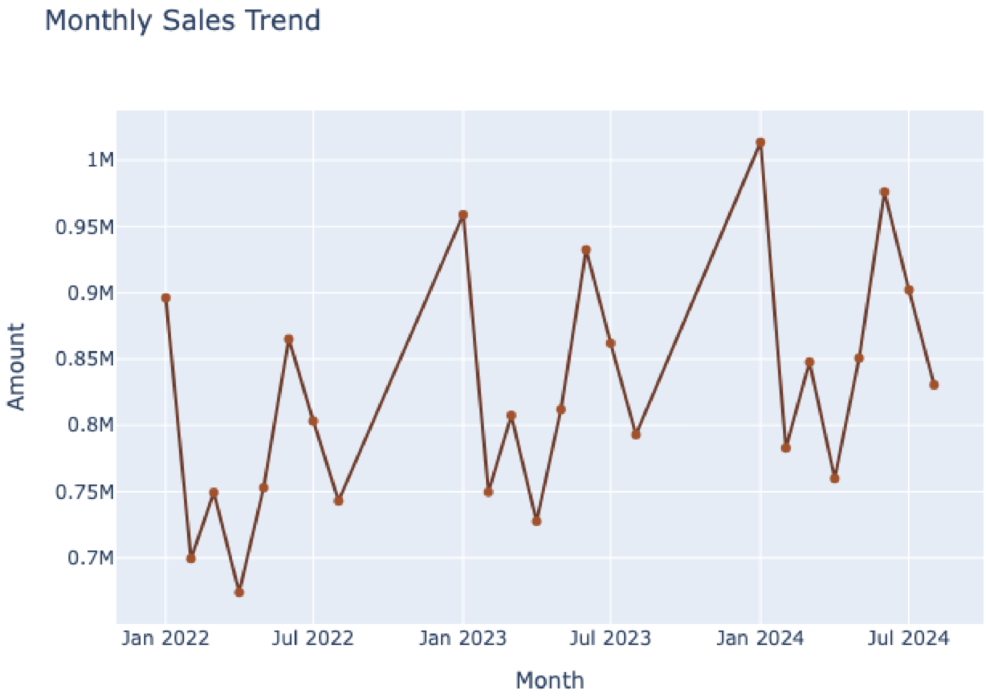
[5]:

```
# Total Sales by Product
sales_by_product = df.groupby("Product", as_index=False)["Amount"].sum().
 ↪sort_values("Amount")
fig = go.Figure(go.Bar(
    x=sales_by_product["Amount"],
    y=sales_by_product["Product"],
    orientation="h",
    marker_color=COLORS[:len(sales_by_product)],
))
fig.update_layout(title="Total Sales by Product", xaxis_title="Amount",␣
 ↪yaxis_title="Product")
fig.show()
```

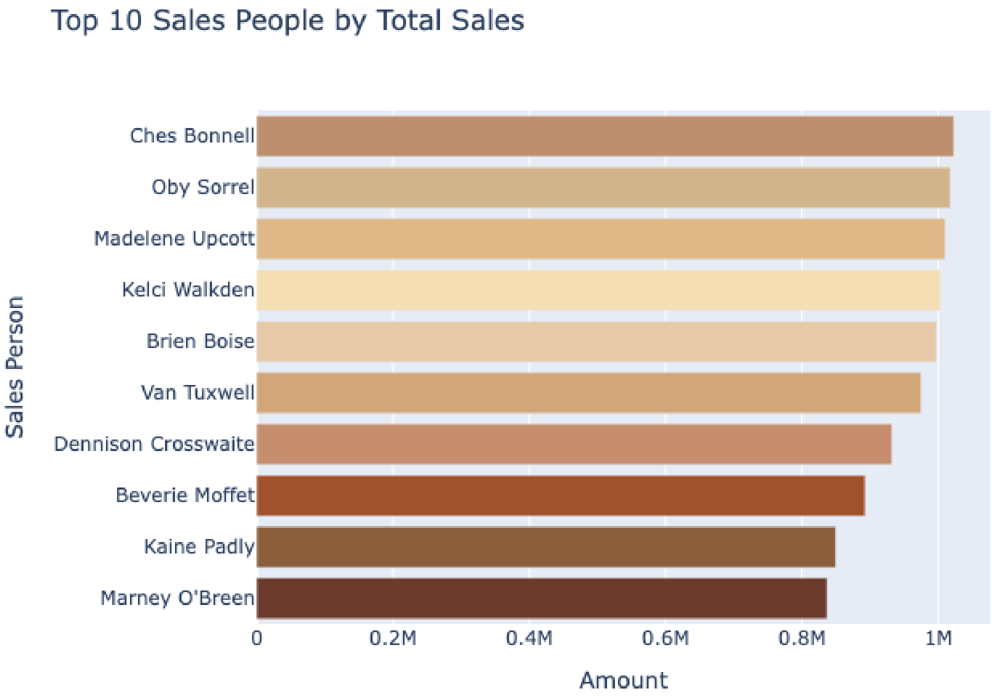


[6]:

```
# Monthly Sales Trend
monthly_sales = df.groupby("Month", as_index=False)["Amount"].sum()
fig = go.Figure(go.Scatter(
    x=monthly_sales["Month"],
    y=monthly_sales["Amount"],
    mode="lines+markers",
    line_color=COLORS[0],
    marker_color=COLORS[2],
))
fig.update_layout(title="Monthly Sales Trend", xaxis_title="Month",␣
  ↪yaxis_title="Amount")
fig.show()
```

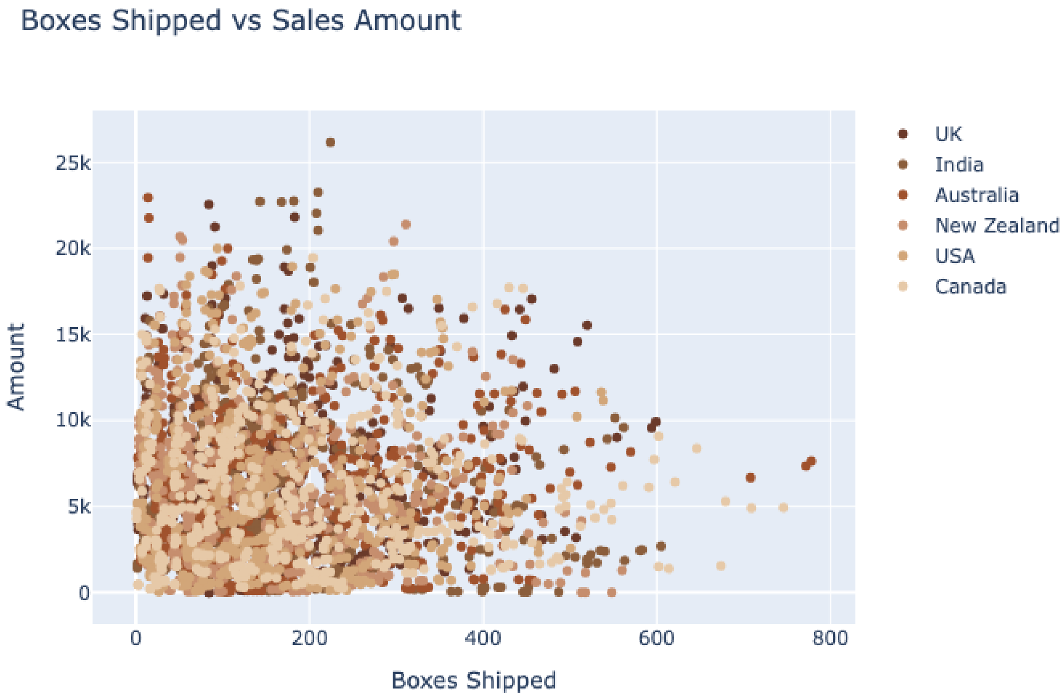


[7]:
```
# Top 10 Sales People by Total Sales
top_sellers = df.groupby("Sales Person", as_index=False)["Amount"].sum().
 ↪sort_values("Amount").tail(10)
fig = go.Figure(go.Bar(
    x=top_sellers["Amount"],
    y=top_sellers["Sales Person"],
    orientation="h",
    marker_color=COLORS[:len(top_sellers)],
))
fig.update_layout(title="Top 10 Sales People by Total Sales",␣
 ↪xaxis_title="Amount", yaxis_title="Sales Person")
fig.show()
```



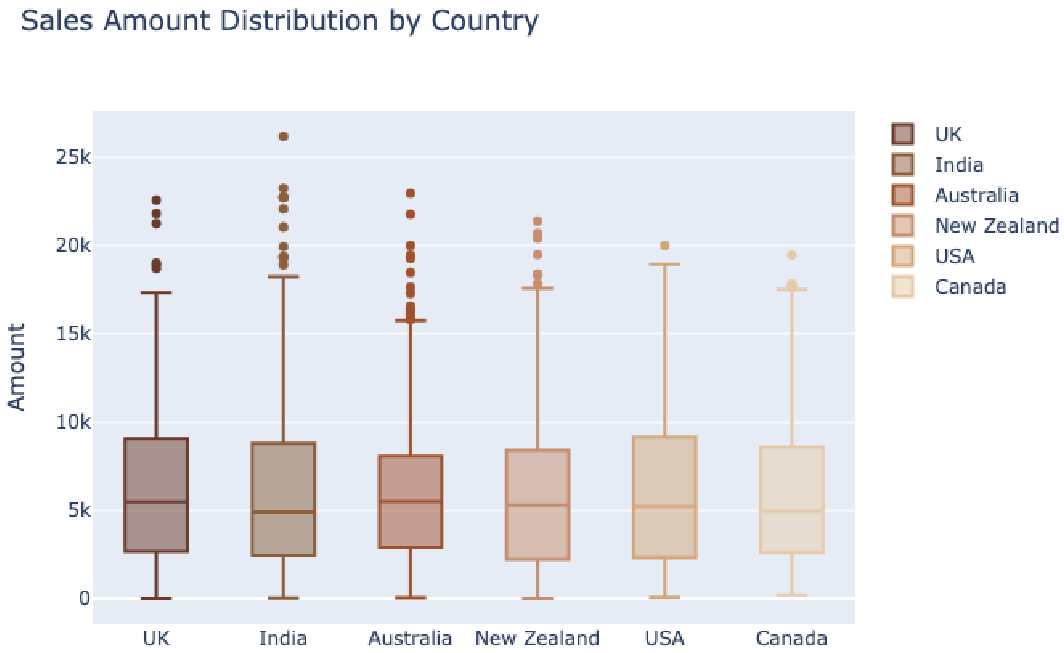
[8]:

```
# Boxes Shipped vs Sales Amount (colored by Country)
fig = go.Figure()
for i, country in enumerate(df["Country"].unique()):
    subset = df[df["Country"] == country]
    fig.add_trace(go.Scatter(
        x=subset["Boxes Shipped"],
        y=subset["Amount"],
        mode="markers",
        name=country,
        marker_color=COLORS[i % len(COLORS)],
    ))
fig.update_layout(title="Boxes Shipped vs Sales Amount", xaxis_title="Boxes␣
 ↪Shipped", yaxis_title="Amount")
fig.show()
```

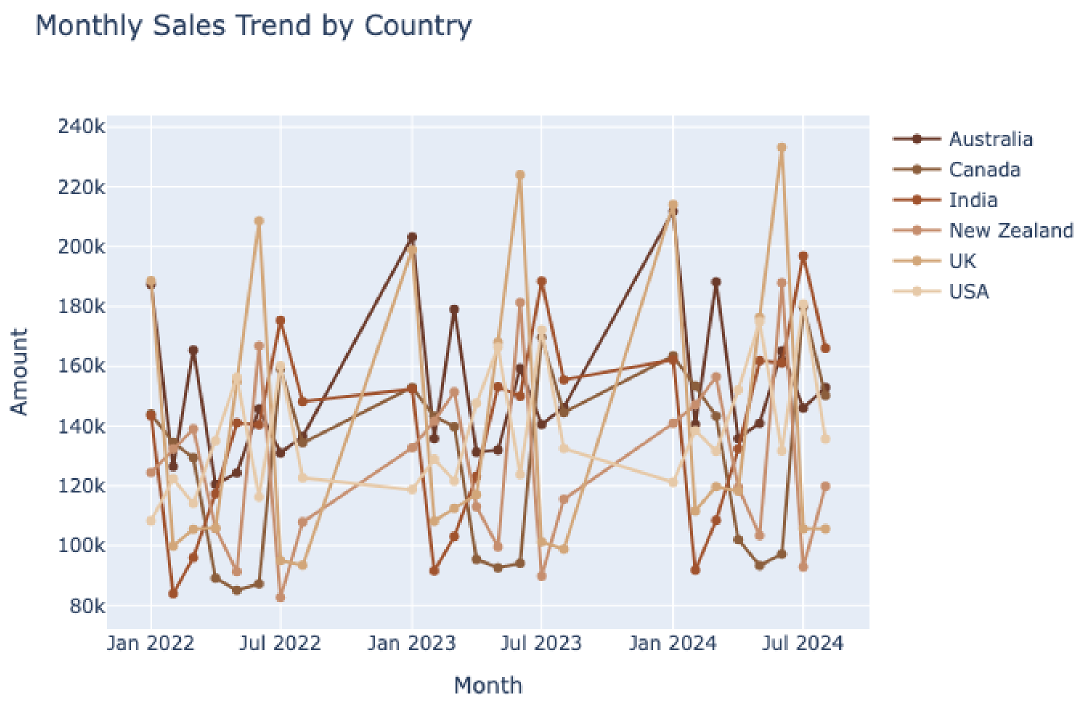


[9]:

```
# Sales Amount Distribution by Country
fig = go.Figure()
for i, country in enumerate(df["Country"].unique()):
    subset = df[df["Country"] == country]
    fig.add_trace(go.Box(
        y=subset["Amount"],
        name=country,
        marker_color=COLORS[i % len(COLORS)],
    ))
fig.update_layout(title="Sales Amount Distribution by Country",␣
 ↪yaxis_title="Amount")
fig.show()
```

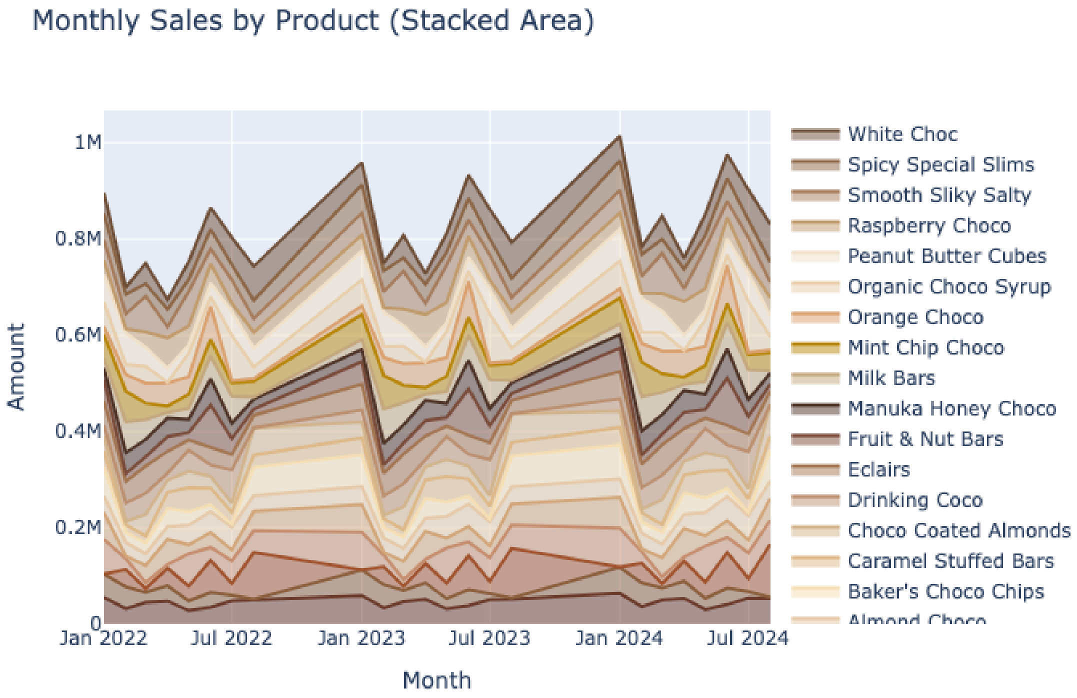


```
[10]: # Monthly Sales Trend by Country
monthly_country = df.groupby(["Month", "Country"], as_index=False)["Amount"].
 ↪sum()
fig = go.Figure()
for i, country in enumerate(monthly_country["Country"].unique()):
    subset = monthly_country[monthly_country["Country"] == country]
    fig.add_trace(go.Scatter(
        x=subset["Month"],
        y=subset["Amount"],
        mode="lines+markers",
        name=country,
        marker_color=COLORS[i % len(COLORS)],
    ))
fig.update_layout(title="Monthly Sales Trend by Country", xaxis_title="Month",␣
 ↪yaxis_title="Amount")
fig.show()
```



[11]:

```
# Monthly Sales by Product (Stacked Area)
product_monthly = df.groupby(["Month", "Product"], as_index=False)["Amount"].
  ↪sum()
fig = go.Figure()
for i, product in enumerate(product_monthly["Product"].unique()):
    subset = product_monthly[product_monthly["Product"] == product]
    fig.add_trace(go.Scatter(
        x=subset["Month"],
        y=subset["Amount"],
        mode="lines",
        name=product,
        stackgroup="one",
        line_color=COLORS[i % len(COLORS)],
    ))
fig.update_layout(title="Monthly Sales by Product (Stacked Area)",␣
  ↪xaxis_title="Month", yaxis_title="Amount")
fig.show()
```


Monthly Sales by Product (Stacked Area)
Amount
1M
0.8M
0.6M
0.4M
0.2M
0
Jan 2022
Jul 2022
Jan 2023
Jul 2023
Jan 2024
Jul 2024
Month
White Choc
Spicy Special Slims
Smooth Sliky Salty
Raspberry Choco
Peanut Butter Cubes
Organic Choco Syrup
Orange Choco
Mint Chip Choco
Milk Bars
Manuka Honey Choco
Fruit & Nut Bars
Eclairs
Drinking Coco
Choco Coated Almonds
Caramel Stuffed Bars
Baker's Choco Chips
Almond Choco