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<pre>df['Order year'] = df['Order</pre>	<pre>Order year')['Total Profit'].sum().reset_index()</pre> Frame'> : unt Dtype
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<pre>sns.lineplot(data=profit_by_) plt.title('Time Trends by yea plt.xlabel('Year') plt.ylabel('Total Profit') plt.show()</pre> <pre>le6</pre> 9 -	Time Trends by year
8 - Total Profit - 2 - 4 - 3 - 8 - 3 - 8	
plot 1 provides insights that I print(df.columns) Index(['Region', 'Country', 'I	2012 2013 2014 2015 2016 2017 Year Detween 2011 to 2013 the profits were increasing but then it came down so we need to focus on how to improve profits tem Type', 'Sales Channel', 'Order Priority', ', 'Ship Date', 'Units Sold', 'Unit Price', sales (Type) (Social Profit)
'Unit Cost', 'Total Rev 'Order year'], dtype='object') region_average_profits = df.g region_average_profits = region_average_profits = region_average_profits = region_average_profits = region_average_profits['average]	', 'Ship Date', 'Units Sold', 'Unit Price', enue', 'Total Cost', 'Total Profit', groupby('Region')['Total Profit'].mean().reset_index() .on_average_profits.rename(columns={'Total Profit': 'average_profits'}) .on_average_profits.sort_values(by='average_profits', ascending=False) .on_average_profits['average_profits'].sum() .on_average_profits_percent'] = round((region_average_profits['average_profits'] / total_average_profits) * 100, 2)
<pre>autopct='%1.2f%%', st plt.title('Regions with Avera plt.axis('equal') # Equal as plt.show()</pre>	Regions with Average Profits Central America and the Caribbean Caran Africa
Sub-San Middle East and North Africa	12.34% Australia and Oceania 17.48% 14.74%
	North America 16.86% 15.28% Europe Europe
<pre>top_5_items = df.groupby('Ite top_5_items = top_5_items.rer top_5_items = top_5_items.sor plt.figure(figsize=(6, 6))</pre>	est average profits, suggesting strong market performance. Consider increasing focus and investment in this region. em Type')['Total Profit'].sum().reset_index() name(columns={'Total Profit': 'Total_profits'}) et_values(by='Total_profits', ascending=False).head(5) tem Type'], top_5_items['Total_profits'], color='darkblue') nerating Most Profits')
<pre>plt.xlabel('Item Types') plt.ylabel('Total Profits') plt.xticks(rotation=45) plt.tight_layout() for bar in bars: height = bar.get_height() plt.text(bar.get_x() + bar.get height, f'{height:,.2f}', ha='center',</pre>	
<pre>va='bottom') plt.show()</pre>	f Items Generating Most Profits
1.2 - 1.0 - \$\frac{1}{2} = 0.8 - \tag{7,412}	5,929,583.75
0.4 -	5,233,334.40 3,886,643.70
	Item Types Usehold items are the top profit-generating categories, so consider focusing your resources and investment on further developing and expanding these product lines. This could involve introducing new procomulations, or enhancing packaging etc.
<pre>top_5_countries = country_pro top_5_countries_data = df[df] country_item_profits = top_5_ country_item_profits.plot(king)</pre>	<pre>('Country')['Total Profit'].sum().reset_index() pfits.sort_values(by='Total Profit', ascending=False).head(5) ('Country'].isin(top_5_countries['Country'])] countries_data.groupby(['Country', 'Item Type'])['Total Profit'].sum().unstack().fillna(0) pd='bar', stacked=True, figsize=(6, 6)) (Total Profits and Item Types')</pre>
	s by Total Profits and Item Types Item Type Cereal Clothes Household Snacks
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country_item_profits ltem Type Cereal Clot Country Djibouti 766835.04	Teach Teac
Honduras0.00Myanmar0.004354Pakistan0.00Samoa0.00 This plot shows that Djibouti	0.0 1487261.02 122686.50 9.2 0.00 1367272.50 0.00 0.0 1719922.04 0.00 0.00 0.0 1678540.98 0.00 0.00 thas highest profits out of all 5 countries and its major profit generated from orders in cosmetics Also out of Top 5 countries cosmetics items are generating most profits Based on the analysis, it appears that
<pre>increase sales of snacks in Ho resonate with the local popul country_sales_channel_profits country_sales_channel_profits</pre>	could be a lucrative strategy for increasing profits. This could involve further investment in marketing, distribution channels, or product development specifically tailored to the cosmetics market. Also in To conduras, Conduct market research to understand consumer preferences, tastes, and purchasing behavior related to snacks in Honduras. Identify popular snack types, flavors, and packaging formats that ation. In pakistan, Consider reallocating resources towards the cosmetics category by expanding your product offerings, introducing new cosmetic products, or enhancing existing ones. Countries_data.groupby(['Country', 'Sales Channel'])['Total Profit'].sum().unstack().fillna(0)
Top 5 Countries 1e6 2.5 -	by Total Profits and Sales Channel Item Type Offline Online
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Region

Making Regions implement cost-reduction strategies to improve profit margins.

Analyze and replicate the successful strategies from Sub-Saharan Africa and Central America in other regions. Continue to invest in and support the growing markets in these regions to sustain and further enhance profitability. In Loss-

In summary, the analysis underscores the importance of strategic interventions to boost profitability and market performance. Key findings suggest a declining profit trend post-2013, with opportunities identified in regions like the Middle East and product categories such as cosmetics and household items. Djibouti emerges as a leader in profitability, particularly in cosmetic sales, highlighting potential avenues for product expansion. Targeted strategies, including market research in Honduras and resource reallocation in Pakistan, can optimize sales. Additionally, cost optimization and addressing logistical challenges are crucial for sustainable growth. Leveraging online sales channels, especially in regions

like Samoa, presents untapped potential. Overall, a strategic approach tailored to regional dynamics and product categories is essential for driving profitability and market expansion.

In [3]: ! pip install matplotlib

Collecting matplotlib

Collecting contourpy>=1.0.1 (from matplotlib)

Collecting fonttools>=4.22.0 (from matplotlib)

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