Business Case Study In [42]: import pandas as pd import plotly.express as px import plotly.io as pio import plotly.colors as colors import datetime as datetime import plotly.graph_objects as go pio.templates.default ="plotly_white" data=pd.read_csv(r"C:\Users\alamm\Downloads\Python Day 28 Data set.csv", encoding='latin-1') In [21]: In [22]: data.head() Out[22]: Row Order Ship Customer Customer Postal Sub-**Ship Date** Product ID Sales Quantity Discount Order ID Segment Country City ... Region Category **Product Name** Profit Date Category Mode ID Name Code CA-**Bush Somerset** FUR-BO-Second United CG-12520 2016-11/8/2016 11/11/2016 Claire Gute Consumer Henderson 42420 South Furniture Bookcases Collection 261.9600 0.00 41.9136 10001798 Class States 152156 Bookcase CA-Hon Deluxe Fabric FUR-CH-Second United Chairs 11/8/2016 11/11/2016 CG-12520 Upholstered 731.9400 2 2016-Claire Gute Consumer 42420 3 0.00 219.5820 1 Henderson South Furniture Class States 10000454 152156 Stacking Chairs,... CA-Self-Adhesive Darrin Van United OFF-LA-Office Second Los 2016-6/12/2016 6/16/2016 DV-13045 Corporate 90036 West Labels Address Labels for 14.6200 2 0.00 6.8714 10000240 Class Huff States Angeles Supplies 138688 Typewriters b... US-Bretford CR4500 Standard Sean United FUR-TA-2015- 10/11/2015 10/18/2015 SO-20335 957.5775 0.45 -383.0310 Consumer 33311 South Furniture Tables Series Slim Lauderdale 10000577 Class O'Donnell States 108966 Rectangular Table US-Sean OFF-ST-Office Standard Fort Eldon Fold 'N Roll United 10/11/2015 10/18/2015 SO-20335 2015-Consumer 33311 South 22.3680 0.20 2.5164 O'Donnell 10000760 States Lauderdale Supplies Cart System 108966 5 rows × 21 columns data.describe() **Postal Code** Out[23]: Row ID Sales Quantity Discount Profit **count** 9994.000000 9994.000000 9994.000000 9994.000000 9994.000000 9994.000000 3.789574 0.156203 229.858001 mean 4997.500000 55190.379428 28.656896 std 2885.163629 32063.693350 623.245101 2.225110 0.206452 234.260108 1.000000 1040.000000 0.444000 1.000000 0.000000 -6599.978000 min 2499.250000 23223.000000 17.280000 2.000000 0.000000 1.728750 4997.500000 56430.500000 54.490000 3.000000 0.200000 8.666500 **75**% 7495.750000 90008.000000 209.940000 5.000000 0.200000 29.364000 14.000000 0.800000 8399.976000 **max** 9994.000000 99301.000000 22638.480000 data['Order Date']=pd.to_datetime(data['Order Date']) data['Ship Date']=pd.to_datetime(data['Ship Date']) data['Order Month']=data['Order Date'].dt.month data['Order Year']=data['Order Date'].dt.year data['Order Day of week']=data['Order Date'].dt.dayofweek data.head() In [25]: Out[25]: Order Ship Ship Customer Order Order City ... Category **Profit** Order ID Segment Country **Product Name** Sales Quantity Discount Day of Date ID Category Date Mode Name Month Year week CA-2016-2016-**Bush Somerset** 261.9600 41.9136 2016 Claire Gute Consumer Henderson Furniture Bookcases 0.00 Collection Bookcase 152156 States 11-08 11-11 Class Hon Deluxe Fabric CA-2016-2016-2016-United Second Upholstered Stacking 731.9400 CG-12520 0.00 219.5820 11 2016 Claire Gute Consumer Henderson Furniture Chairs 1 152156 11-08 11-11 Class States Chairs,... Self-Adhesive Address 2016-2016-Office CA-2016-Second Darrin Van United DV-13045 Corporate 14.6200 2 0.00 6.8714 2016 6 Los Angeles Labels Labels for Typewriters 138688 06-12 06-16 Class Huff States Supplies b... Bretford CR4500 US-2015-2015-2015-Standard United Fort Sean SO-20335 Consumer 2015 Furniture Tables Series Slim 957.5775 0.45 -383.0310 10 6 O'Donnell 108966 10-11 10-18 Class States Lauderdale Rectangular Table US-2015-2015-2015-Standard Sean Fort Office Eldon Fold 'N Roll United SO-20335 Consumer Storage 22.3680 0.20 2.5164 10 2015 6 10-18 O'Donnell 108966 10-11 Class States Lauderdale Supplies Cart System 5 rows × 24 columns sales_by_month=data.groupby('Order Month')['Sales'].sum().reset_index() fig=px.line(sales_by_month, x="Order Month", y="Sales", title="Monthly Sales Analysis") fig.show() Monthly Sales Analysis 350k 300k 250k Sales 200k 150k 100k 50k 10 12 Order Month In []: sales_by_category=data.groupby("Category")['Sales'].sum().reset_index() fig=px.pie(sales_by_category, values="Sales", names="Category", hole=0.5, color_discrete_sequence=px.colors.qualitative.Pastel) fig.update_traces(textposition='inside', textinfo='percent+label') fig.update_layout(title_text='Sales Analysis by Category', title_font=dict(size=24)) fig.show() iiii Sales Analysis by Category Technology Furniture Office Supplies Furniture 32.3% Technology 36.4% Office Supplies 31.3% In []: In [35]: profit_by_month=data.groupby('Order Month')['Profit'].sum().reset_index() fig=px.line(profit_by_month, x="Order Month" , y="Profit", title="Analysis Profits") fig.show() **Analysis Profits** 45k 40k 35k 30k Profit 25k 20k 15k 10k 2 10 12 Order Month In [41]: profit_by_category=data.groupby('Category')["Profit"].sum().reset_index() fig=px.pie(profit_by_category, values="Profit", names="Category", hole=0.5, color_discrete_sequence=px.colors.qualitative.Pastel) fig.update_traces(textposition='inside',textinfo='percent+label') fig.update_layout(title_text='Profit Analysis by Category', title_font=dict(size=24)) fig.show() iiii Profit Analysis by Category Technology Office Supplies Furniture Office Supplies 42.8% Technology 50.8% Furniture 6.44% In []: In [44]: sales_profit_by_segment=data.groupby("Segment").agg({'Sales':"sum", "Profit":"sum"}).reset_index() color_palette=colors.qualitative.Pastel fig=go.Figure() fig.add_trace(go.Bar(x=sales_profit_by_segment['Segment'], y=sales_profit_by_segment['Sales'], name="Sales", marker_color=color_palette[6])) fig.add_trace(go.Bar(x=sales_profit_by_segment['Segment'], y=sales_profit_by_segment['Profit'], name="Profit", marker_color=color_palette[0])) fig.update_layout(title="Sales and Profit Analysis By Customer Segment", xaxis_title="Customer Segment", yaxis_title="Amount") fig.show() Sales and Profit Analysis By Customer Segment 1.2M Sales Profit 1M 0.8M Amount 0.6M 0.4M 0.2M Consumer Corporate Home Office **Customer Segment**