```
1  import pandas as pd
2  import plotly.express as px
3  import plotly.io as pio
4  import plotly.graph_objects as go
5  pio.templates.default = "plotly_white"
```

```
1  df = pd.read_csv("/content/drive/MyDrive/Colab Notebooks/Dataset/supply_chain_data.csv")
2  df.head()
```

	Product type	SKU	Price	Availability	Number of products sold	Revenue generated	Customer demographics	St le\
0	haircare	SKU0	69.808006	55	802	8661.996792	Non-binary	
1	skincare	SKU1	14.843523	95	736	7460.900065	Female	
2	haircare	SKU2	11.319683	34	8	9577.749626	Unknown	
3	skincare	SKU3	61.163343	68	83	7766.836426	Non-binary	
4	skincare	SKU4	4.805496	26	871	2686.505152	Non-binary	

5 rows × 24 columns

```
1 df.describe()
```

	Price	Availability	Number of products sold	Revenue generated	Stock levels	Lead times	qu
count	100.000000	100.000000	100.000000	100.000000	100.000000	100.000000	10
mean	49.462461	48.400000	460.990000	5776.048187	47.770000	15.960000	4
std	31.168193	30.743317	303.780074	2732.841744	31.369372	8.785801	2
min	1.699976	1.000000	8.000000	1061.618523	0.000000	1.000000	
25%	19.597823	22.750000	184.250000	2812.847151	16.750000	8.000000	2
50%	51.239831	43.500000	392.500000	6006.352023	47.500000	17.000000	5
75%	77.198228	75.000000	704.250000	8253.976921	73.000000	24.000000	7
max	99.171329	100.000000	996.000000	9866.465458	100.000000	30.000000	9

```
1 fig = px.scatter(df, x='Price',
2                  y='Revenue generated',
3                  color='Product type',
4                  hover_data=['Number of products sold'],
5                  trendline="ols")
6 fig.show()
```
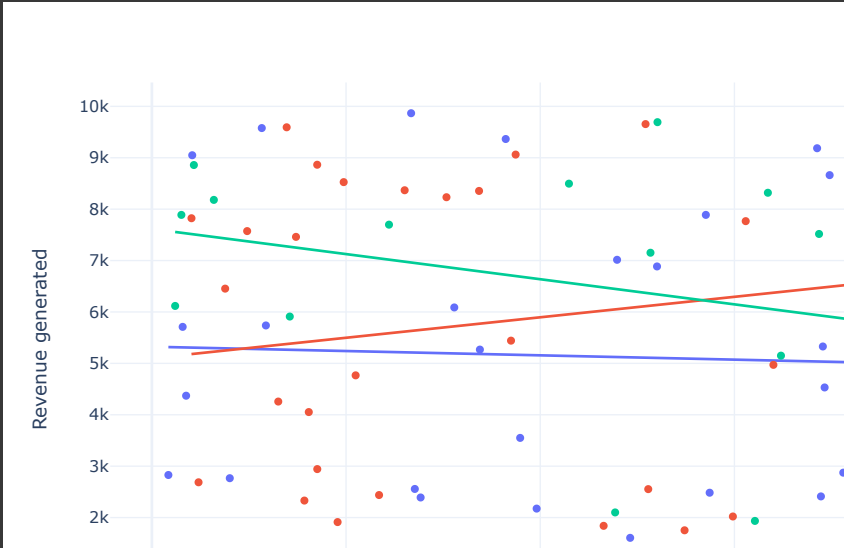
```
1 sales_data = df.groupby('Product type')['Number of products sold'].sum().reset_index()
2
3 pie_chart = px.pie(sales_data, values='Number of products sold', names='Product type',
4                    title='Sales by Product Type',
5                    hover_data=['Number of products sold'],
6                    hole=0.5,
7                    color_discrete_sequence=px.colors.qualitative.Pastel)
8
9 pie_chart.update_traces(textposition='inside', textinfo='percent+label')
10 pie_chart.show()
```

Sales by Product Type
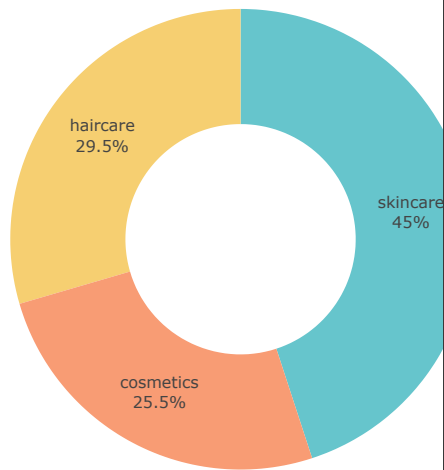

```
1 total_revenue = df.groupby('Shipping carriers')['Revenue generated'].sum().reset_index()
2 fig = go.Figure()
3 fig.add_trace(go.Bar(x=total_revenue['Shipping carriers'],
4                      y=total_revenue['Revenue generated']))
5 fig.update_layout(title='Total Revenue by Shipping Carrier',
6                   xaxis_title='Shipping Carrier',
7                   yaxis_title='Revenue Generated')
8 fig.show()
```

Total Revenue by Shipping Carrier
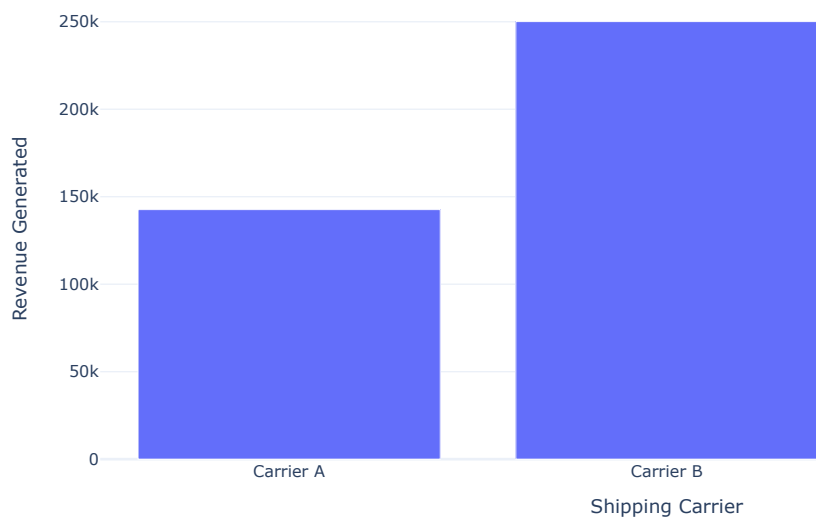

```
1 avg_lead_time = df.groupby('Product type')['Lead time'].mean().reset_index()
2 avg_manufacturing_costs = df.groupby('Product type')['Manufacturing costs'].mean().reset_index()
```

```
3 result = pd.merge(avg_lead_time, avg_manufacturing_costs, on='Product type')
4 result.rename(columns={'Lead time': 'Average Lead Time', 'Manufacturing costs': 'Average Manufacturing Costs'}, inplace=True
```
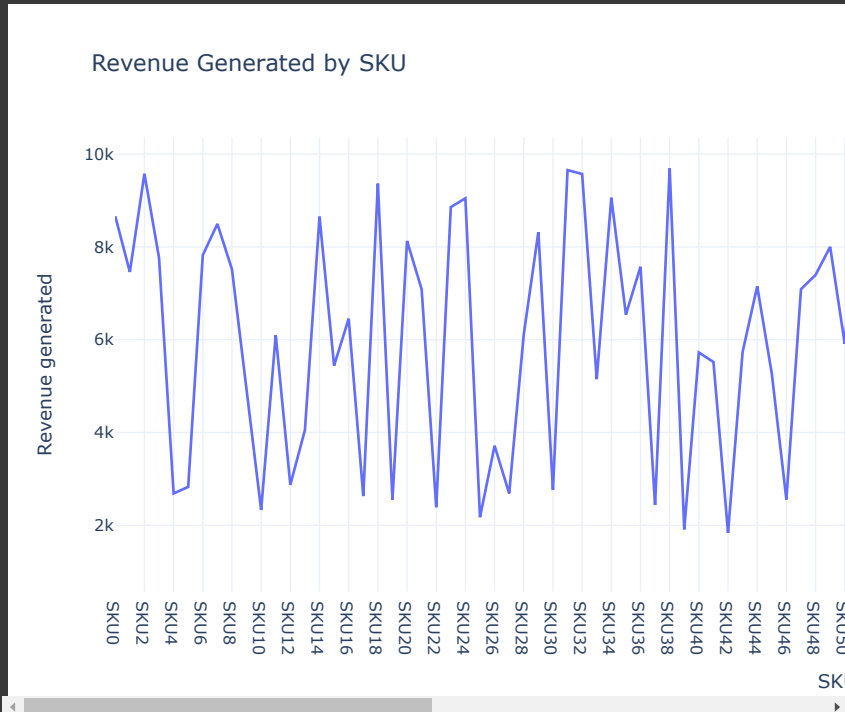
	Product type	Average Lead Time	Average Manufacturing Costs
0	cosmetics	13.538462	43.052740
1	haircare	18.705882	48.457993
2	skincare	18.000000	48.993157

```
1 revenue_chart = px.line(df, x='SKU',
2                         y='Revenue generated',
3                         title='Revenue Generated by SKU')
4 revenue_chart.show()
```
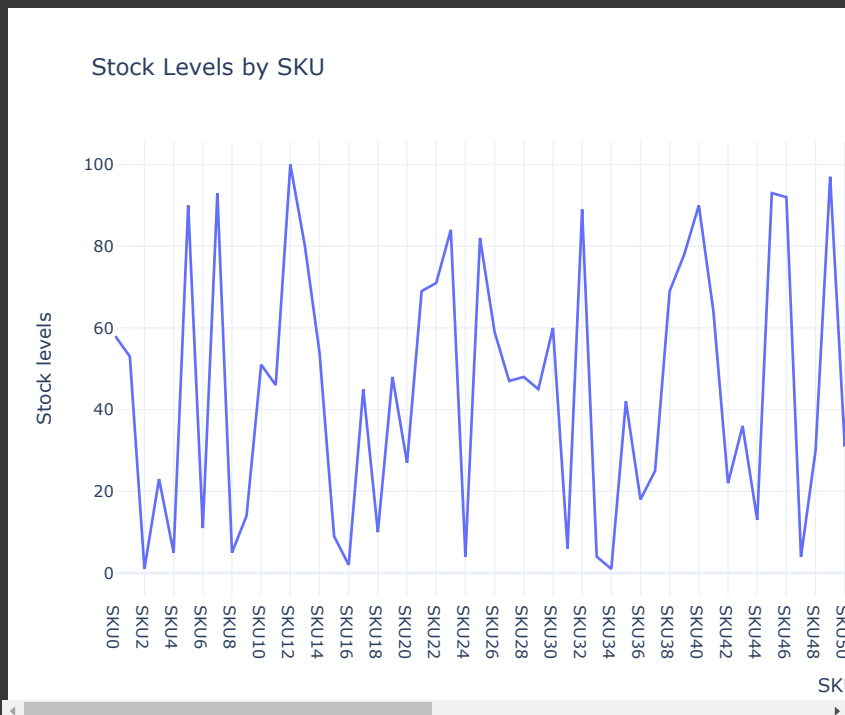


```
1 stock_chart = px.line(df, x='SKU',
2                       y='Stock levels',
3                       title='Stock Levels by SKU')
4 stock_chart.show()
```
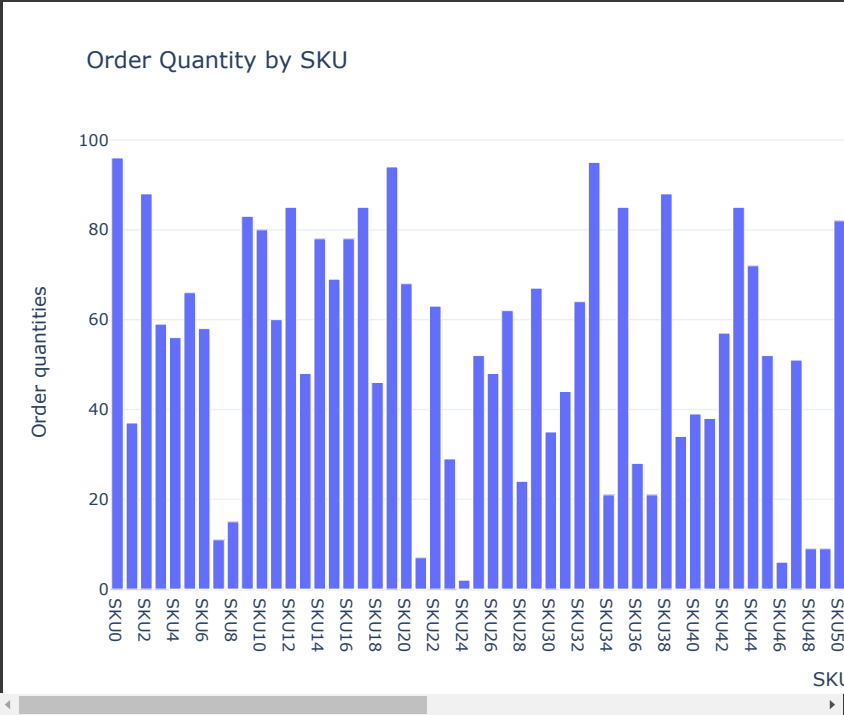


```
1 order_quantity_chart = px.bar(df, x='SKU',
2                               y='Order quantities',
3                               title='Order Quantity by SKU')
4 order_quantity_chart.show()
```

Order Quantity by SKU



```
1 shipping_cost_chart = px.bar(df, x='Shipping carriers',
2                              y='Shipping costs',
3                              title='Shipping Costs by Carrier')
4 shipping_cost_chart.show()
```

Shipping Costs by Carrier


```
1 transportation_chart = px.pie(df,
2                               values='Costs',
3                               names='Transportation modes',
4                               title='Cost Distribution by Transportation Mode',
5                               hole=0.5,
6                               color_discrete_sequence=px.colors.qualitative.Pastel)
7 transportation_chart.show()
```
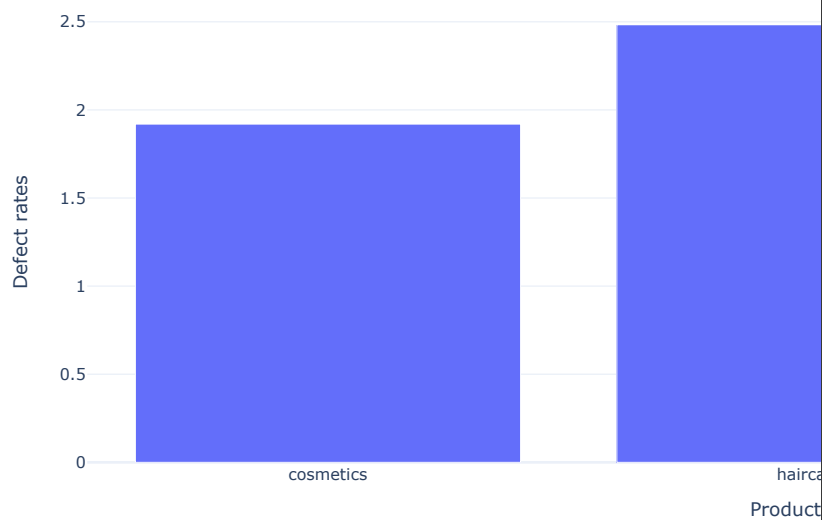
Cost Distribution by Transportation Mode
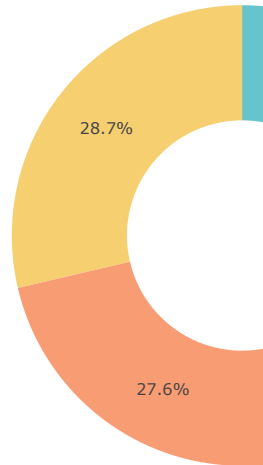

```
1 defect_rates_by_product = df.groupby('Product type')['Defect rates'].mean().reset_index()
2
3 fig = px.bar(defect_rates_by_product, x='Product type', y='Defect rates',
4             title='Average Defect Rates by Product Type')
5 fig.show()
```

Average Defect Rates by Product Type


```
 1  pivot_table = pd.pivot_table(df, values='Defect rates',
 2                              index=['Transportation modes'],
 3                              aggfunc='mean')
 4
 5  transportation_chart = px.pie(values=pivot_table["Defect rates"],
 6                              names=pivot_table.index,
 7                              title='Defect Rates by Transportation Mode',
 8                              hole=0.5,
 9                              color_discrete_sequence=px.colors.qualitative.Pastel)
10  transportation_chart.show()
```

Defect Rates by Transportation Mode