Praktikum Eksplorasi dan Visualisasi Data

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Analisa

In [ ]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns

# Load the data
df = pd.read_excel('Tokokita.xlsx', sheet_name='Toko')
df
```

Out[ ]:

	Tanggal	Kode Barang	Nama Barang	Kategori	Sat	Qty	Jual(Rp)	Beli(Rp)	P
0	2020-01-03	8.992779e+12	GLADE GANTUNG NOUNTAIN PINE 75+10GR	PEWANGI	pcs	77.0	11000.0	9600.0	
1	2020-01-04	2.011040e+05	SARDEN ABC KECIL	DAGING	can	244.0	10000.0	7500.0	2
2	2020-01-06	2.028080e+05	BANGO KECAP BOTOL 135ml	KECAP	btl	100.0	11000.0	9570.0	1
3	2020-01-08	8.992747e+12	VIXAL HARUM SEGAR 780ML	PEMBERSIH LANTAI	pcs	169.0	17000.0	15290.0	2
4	2020-01-10	7.000090e+05	RINSO DETERGENT ANTI NODA 800GR	DETERGEN	pcs	50.0	21800.0	19580.0	1
...	...	...	...	...	...	...	...	...	...
796	NaT	NaN	NaN	NaN	NaN	NaN	NaN	NaN	
797	NaT	NaN	NaN	NaN	NaN	NaN	NaN	NaN	
798	NaT	NaN	NaN	NaN	NaN	NaN	NaN	NaN	
799	NaT	NaN	NaN	NaN	NaN	NaN	NaN	NaN	
800	NaT	NaN	NaN	NaN	NaN	NaN	NaN	NaN	

In [ ]:
```
print(df.info())

print(df.describe())
```

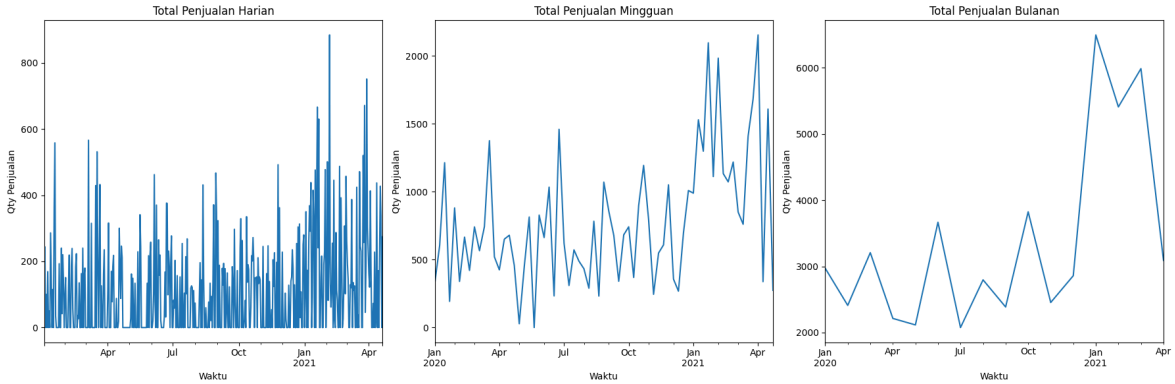
```
print("\
Missing values:")
print(df.isnull().sum())

print("\
Duplicate rows:", df.duplicated().sum())

print("\
Date range:")
print(df['Tanggal'].min(), "to", df['Tanggal'].max())
df = df.dropna()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 801 entries, 0 to 800
Data columns (total 12 columns):
 #   Column       Non-Null Count  Dtype
---  ------       --------------  -----
 0   Tanggal      400 non-null    datetime64[ns]
 1   Kode Barang  400 non-null    float64
 2   Nama Barang  400 non-null    object
 3   Kategori     400 non-null    object
 4   Sat          400 non-null    object
 5   Qty          400 non-null    float64
 6   Jual(Rp)     399 non-null    float64
 7   Beli(Rp)     399 non-null    float64
 8   Penjualan    400 non-null    float64
 9   Pembelian    400 non-null    float64
 10  Region       801 non-null    object
 11  City         801 non-null    object
dtypes: datetime64[ns](1), float64(6), object(5)
memory usage: 75.2+ KB
None
                   Tanggal   Kode Barang         Qty       Jual(Rp)  \
count                  400  4.000000e+02  400.000000     399.000000
mean   2020-10-02 22:55:12  5.021799e+12  135.135000   22305.764411
min    2020-01-03 00:00:00  1.000010e+05   15.000000     750.000000
25%    2020-06-11 00:00:00  5.012248e+05   81.750000    3750.000000
50%    2020-10-23 00:00:00  8.886008e+12  134.000000   12000.000000
75%    2021-02-05 00:00:00  8.996007e+12  192.250000   23000.000000
max    2021-04-20 00:00:00  8.993189e+13  250.000000  750000.000000
std                    NaN  6.287174e+12   66.248842   62102.078630

            Beli(Rp)     Penjualan     Pembelian
count     399.000000  4.000000e+02  4.000000e+02
mean    18796.548037  3.208096e+06  2.706293e+06
min       300.000000  0.000000e+00  0.000000e+00
25%      2958.333333  4.190000e+05  3.160208e+05
50%      9300.000000  1.151500e+06  9.613500e+05
75%     17812.500000  2.962575e+06  2.376536e+06
max    675000.000000  1.695000e+08  1.525500e+08
std     55438.083715  1.200697e+07  1.076738e+07
Missing values:
Tanggal        401
Kode Barang    401
Nama Barang    401
Kategori       401
Sat            401
Qty            401
Jual(Rp)       402
Beli(Rp)       402
Penjualan      401
Pembelian      401
Region           0
City             0
dtype: int64
Duplicate rows: 391
Date range:
2020-01-03 00:00:00 to 2021-04-20 00:00:00
```

Visualisasi

In [ ]:
```
# Ubah tipe data dan hitung penjualan
df['Tanggal'] = pd.to_datetime(df['Tanggal'])
sales = df.groupby('Tanggal')['Qty'].sum()

# Buat plot
fig, axes = plt.subplots(1, 3, figsize=(18, 6))
freqs = ['D', 'W', 'M']
titles = ['Harian', 'Mingguan', 'Bulanan']

for i, (freq, title) in enumerate(zip(freqs, titles)):
    sales.resample(freq).sum().plot(ax=axes[i])
    axes[i].set(title=f'Total Penjualan {title}', xlabel='Waktu', ylabel='Qty Pe

plt.tight_layout()
plt.show()
```

```
C:\Users\M S I\AppData\Local\Temp\ipykernel_23508\1138883959.py:2: SettingWithCop
yWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stabl
e/user_guide/indexing.html#returning-a-view-versus-a-copy
  df['Tanggal'] = pd.to_datetime(df['Tanggal'])
C:\Users\M S I\AppData\Local\Temp\ipykernel_23508\1138883959.py:11: FutureWarnin
g: 'M' is deprecated and will be removed in a future version, please use 'ME' ins
tead.
  sales.resample(freq).sum().plot(ax=axes[i])
```

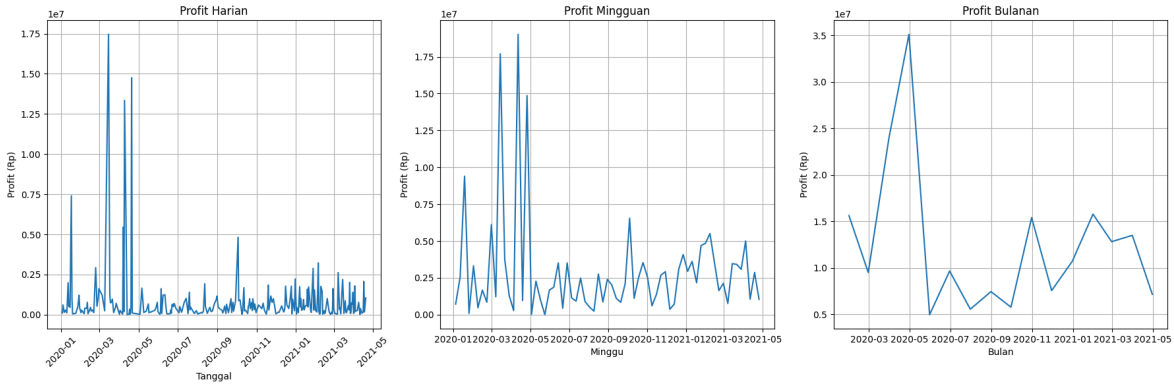


🖌️ **Analisis :** Dari visualisasi di atas dapat disimpulkan bahwa total penjualan toko di akhir 2020 hingga awal 2021 mengalami lonjakan, mungkin karena efek dari COVID-19. Hasil penjualan cenderung fluktuatif.

In [ ]:
```
# Menghitung profit
df['Profit'] = df['Penjualan'] - df['Pembelian']

# Mengelompokkan data berdasarkan tanggal, minggu, dan bulan
profit_harian = df.groupby('Tanggal')['Profit'].sum().reset_index()
profit_mingguan = df.groupby(pd.Grouper(key='Tanggal', freq='W'))['Profit'].sum(
profit_bulanan = df.groupby(pd.Grouper(key='Tanggal', freq='M'))['Profit'].sum()

# Membuat subplot
fig, axes = plt.subplots(nrows=1, ncols=3, figsize=(18, 6))

# Plot profit harian
```

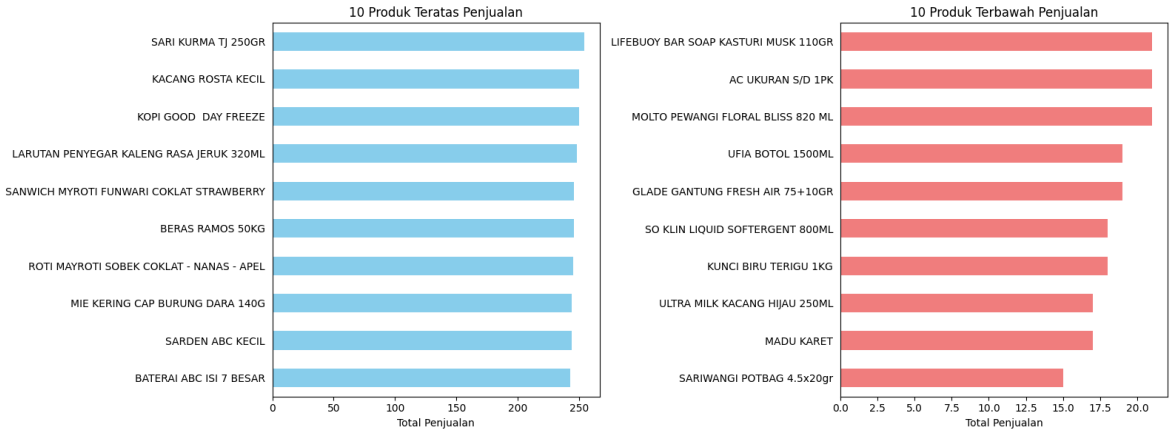
```python
axes[0].plot(profit_harian['Tanggal'], profit_harian['Profit'], linestyle='-')
axes[0].set_title('Profit Harian')
axes[0].set_xlabel('Tanggal')
axes[0].set_ylabel('Profit (Rp)')
axes[0].grid(True)
axes[0].tick_params(axis='x', rotation=45)

# Plot profit mingguan
axes[1].plot(profit_mingguan['Tanggal'], profit_mingguan['Profit'], linestyle='-
axes[1].set_title('Profit Mingguan')
axes[1].set_xlabel('Minggu')
axes[1].set_ylabel('Profit (Rp)')
axes[1].grid(True)

# Plot profit bulanan
axes[2].plot(profit_bulanan['Tanggal'], profit_bulanan['Profit'], linestyle='-')
axes[2].set_title('Profit Bulanan')
axes[2].set_xlabel('Bulan')
axes[2].set_ylabel('Profit (Rp)')
axes[2].grid(True)

# Sesuaikan jarak antar subplot
plt.tight_layout()

plt.show()
```

```
C:\Users\M S I\AppData\Local\Temp\ipykernel_23508\250268152.py:2: SettingWithCopy
Warning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stabl
e/user_guide/indexing.html#returning-a-view-versus-a-copy
  df['Profit'] = df['Penjualan'] - df['Pembelian']
C:\Users\M S I\AppData\Local\Temp\ipykernel_23508\250268152.py:7: FutureWarning:
'M' is deprecated and will be removed in a future version, please use 'ME' instea
d.
  profit_bulanan = df.groupby(pd.Grouper(key='Tanggal', freq='M'))['Profit'].sum
().reset_index()
```

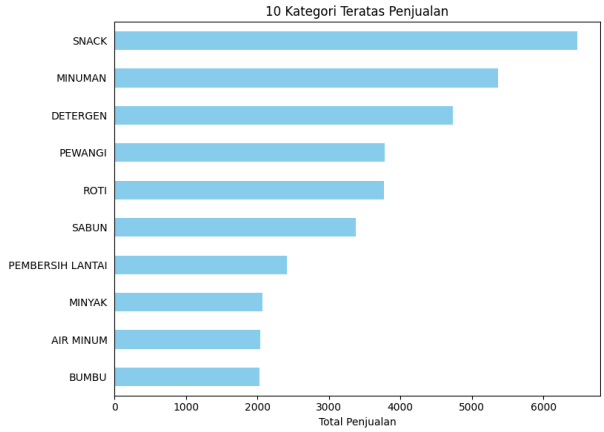


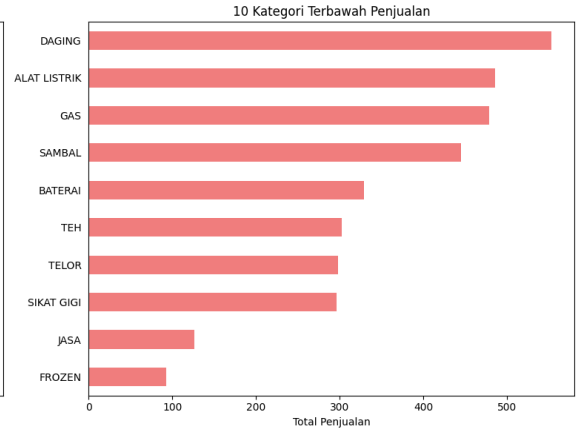
🖊️ **Analisis :** Dari visualisasi di atas dapat disimpulkan bahwa total penjualan toko di akhir 2020 hingga awal 2021 mengalami lonjakan, mungkin karena efek dari COVID-19. Hasil penjualan cenderung fluktuatif.

In [ ]:
```python
# Kelompokkan data dan dapatkan 10 produk teratas dan terbawah
sales_by_product = df.groupby('Nama Barang')['Qty'].sum().sort_values()
top_10 = sales_by_product.iloc[-10:]
bottom_10 = sales_by_product.iloc[:10]

# Buat plot
fig, axes = plt.subplots(1, 2, figsize=(16, 6))
plots = [(top_10, 'Teratas', 'skyblue'), (bottom_10, 'Terbawah', 'lightcoral')]

for i, (data, label, color) in enumerate(plots):
    data.plot(kind='barh', ax=axes[i], color=color)
    axes[i].set(title=f'10 Produk {label} Penjualan', xlabel='Total Penjualan',
    axes[i].tick_params(left=False)

plt.tight_layout()
plt.show()
```



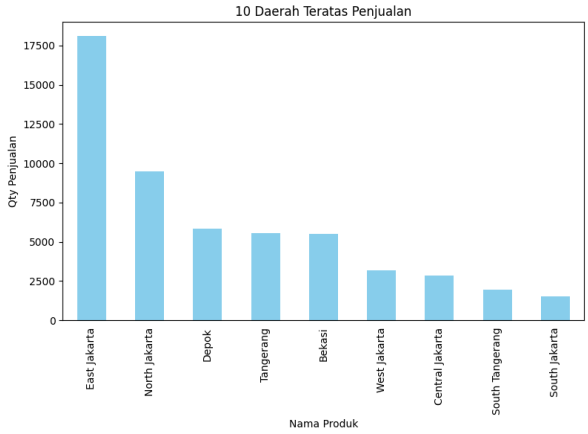
In [ ]:
```python
# Kelompokkan data dan dapatkan 10 produk teratas dan terbawah
sales_by_product = df.groupby('Kategori')['Qty'].sum().sort_values()
top_10 = sales_by_product.iloc[-10:]
bottom_10 = sales_by_product.iloc[:10]

# Buat plot
fig, axes = plt.subplots(1, 2, figsize=(16, 6))
plots = [(top_10, 'Teratas', 'skyblue'), (bottom_10, 'Terbawah', 'lightcoral')]

for i, (data, label, color) in enumerate(plots):
    data.plot(kind='barh', ax=axes[i], color=color)
    axes[i].set(title=f'10 Kategori {label} Penjualan', xlabel='Total Penjualan'
    axes[i].tick_params(left=False)

plt.tight_layout()
plt.show()
```

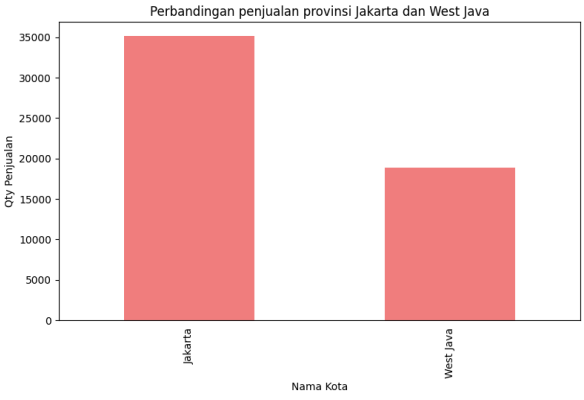




🖌 **Analisis :** Dari visualisasi di atas kita dapat mendapatkan sebuah insight produk dan kategori apa yang paling laris terjual di toko. Disini kita bisa mengevaluasi untuk tren peminat customer sehingga bisa menyediakan stock lebih banyak lagi

In [ ]:
```
# Kelompokkan data dan dapatkan 10 produk teratas dan terbawah berdasarkan penju
province = df.groupby('City')['Qty'].sum().sort_values(ascending=False).head(9)
kota = df.groupby('Region')['Qty'].sum().sort_values(ascending=False).head(2)

fig, axes = plt.subplots(nrows=1, ncols=2, figsize=(16, 6))

province.plot(kind='bar', ax=axes[0], color='skyblue')
axes[0].set_title('10 Daerah Teratas Penjualan')
axes[0].set_xlabel('Nama Produk')
axes[0].set_ylabel('Qty Penjualan')
axes[0].tick_params(bottom=False)

kota.plot(kind='bar', ax=axes[1], color='lightcoral')
axes[1].set_title('Perbandingan penjualan provinsi Jakarta dan West Java')
axes[1].set_xlabel('Nama Kota')
axes[1].set_ylabel('Qty Penjualan')
axes[1].tick_params(bottom=False)

plt.tight_layout()
plt.show()
```





🖌 **Analisis :** Dari visualisasi di atas kita dapat mendapatkan sebuah insight daerah dengan penjualan paling tinggi. Lalu Terdapat komparasi perbandingan penjualan

provinsi Jakarta dan Region Jakarta dan West Java. Sehingga visualisasi ini dapat dijadikan dasar untuk target marketing yang disesuaikan dengan lokasi customer.