IMPORTING LIBRARIES

```
import pandas as pd
```

DATA CLEANING

```
df = pd.read_csv("C:/Users/lekhs/OneDrive/Documents/retail_price
1.csv")
print(df['months_year'].unique()[:100])
df['months_year'] = df['months_year'].astype(str).str.strip()
df['months_year'] = pd.to_datetime(df['months_year'], errors='coerce',
dayfirst=True)
df['months_year'] = df['months_year'].dt.strftime('%Y-%m-%d')
df.to_csv(r"C:/Users/lekhs/OneDrive/Documents/retail_price_clean.csv",
index=False)
print(df['months_year'].isna().sum())
```

```
['2017-05-01' '2017-05-02' '2017-05-03' '2017-05-04' '2017-05-05'
 '2017-05-06' '2017-05-07' '2017-05-08' '2017-05-09' '2017-05-10'
 '2017-05-11' '2017-05-12' '2017-05-13' '2017-05-14' '2017-05-15'
 '2017-05-16' '2017-05-17' '2017-05-18' '2017-05-19' '2017-05-20'
 '2017-05-21' '2017-05-22' '2017-05-23' '2017-05-24' '2017-05-25'
 '2017-05-26' '2017-05-27' '2017-05-28' '2017-05-29' '2017-05-30'
 '2017-05-31' '2017-06-01' '2017-06-02' '2017-06-03' '2017-06-04'
 '2017-06-05' '2017-06-06' '2017-06-07' '2017-06-08' '2017-06-09'
 '2017-06-10' '2017-06-11' '2017-06-12' '2017-06-13' '2017-06-14'
 '2017-06-15' '2017-06-16' '2017-06-17' '2017-06-18' '2017-06-19'
 '2017-06-20' '2017-06-21' '2017-06-22' '2017-06-23' '2017-06-24'
 '2017-06-25' '2017-06-26' '2017-06-27' '2017-06-28' '2017-06-29'
 '2017-06-30' '2017-07-01' '2017-07-02' '2017-07-03' '2017-07-04'
 '2017-07-05' '2017-07-06' '2017-07-07' '2017-07-08' '2017-07-09'
 '2017-07-10' '2017-07-11' '2017-07-12' '2017-07-13' '2017-07-14'
 '2017-07-15' '2017-07-16' '2017-07-17' '2017-07-18' '2017-07-19'
 '2017-07-20' '2017-07-21' '2017-07-22' '2017-07-23' '2017-07-24'
 '2017-07-25' '2017-07-26' '2017-07-27' '2017-07-28' '2017-07-29'
 '2017-07-30' '2017-07-31' '2017-08-01' '2017-08-02' '2017-08-03'
 '2017-08-04' '2017-08-05' '2017-08-06' '2017-08-07' '2017-08-08']
406
```

```
print(df)
```

```
    product_id product_category_name months_year  qty  total_price  \
0         bed1        bed_bath_table  2017-01-05    1        45.95
1         bed1        bed_bath_table  2017-02-05    3       137.85
2         bed1        bed_bath_table  2017-03-05    6       275.70
3         bed1        bed_bath_table  2017-04-05    4       183.80
4         bed1        bed_bath_table  2017-05-05    2        91.90
..         ...                   ...         ...  ...          ...
```

```
671       bed5        bed_bath_table  2019-03-03    1       215.00
672       bed5        bed_bath_table  2019-04-03   10      2090.00
673       bed5        bed_bath_table  2019-05-03   59     12095.00
674       bed5        bed_bath_table  2019-06-03   52     10375.00
675       bed5        bed_bath_table         NaN   32      5222.36

     freight_price  unit_price  product_name_lenght  \
0        15.100000   45.950000                   39
1        12.933333   45.950000                   39
2        14.840000   45.950000                   39
3        14.287500   45.950000                   39
4        15.100000   45.950000                   39
..             ...         ...                  ...
671       8.760000  215.000000                   56
672      21.322000  209.000000                   56
673      22.195932  205.000000                   56
674      19.412885  199.509804                   56
675      24.324687  163.398710                   56

     product_description_lenght  product_photos_qty  ...  comp_1  ps1
\
0                           161                   2  ...    89.9  3.9

1                           161                   2  ...    89.9  3.9

2                           161                   2  ...    89.9  3.9

3                           161                   2  ...    89.9  3.9

4                           161                   2  ...    89.9  3.9

..                          ...                 ...  ...     ...  ...

671                         162                   5  ...    89.9  3.9

672                         162                   5  ...    89.9  3.9

673                         162                   5  ...    89.9  3.9

674                         162                   5  ...    89.9  3.9

675                         162                   5  ...    89.9  3.9


           fp1      comp_2  ps2        fp2  comp_3  ps3        fp3
lag_price
0    15.011897  215.000000  4.4   8.760000   45.95  4.0  15.100000
45.900000
1    14.769216  209.000000  4.4  21.322000   45.95  4.0  12.933333
45.950000
2    13.993833  205.000000  4.4  22.195932   45.95  4.0  14.840000
```

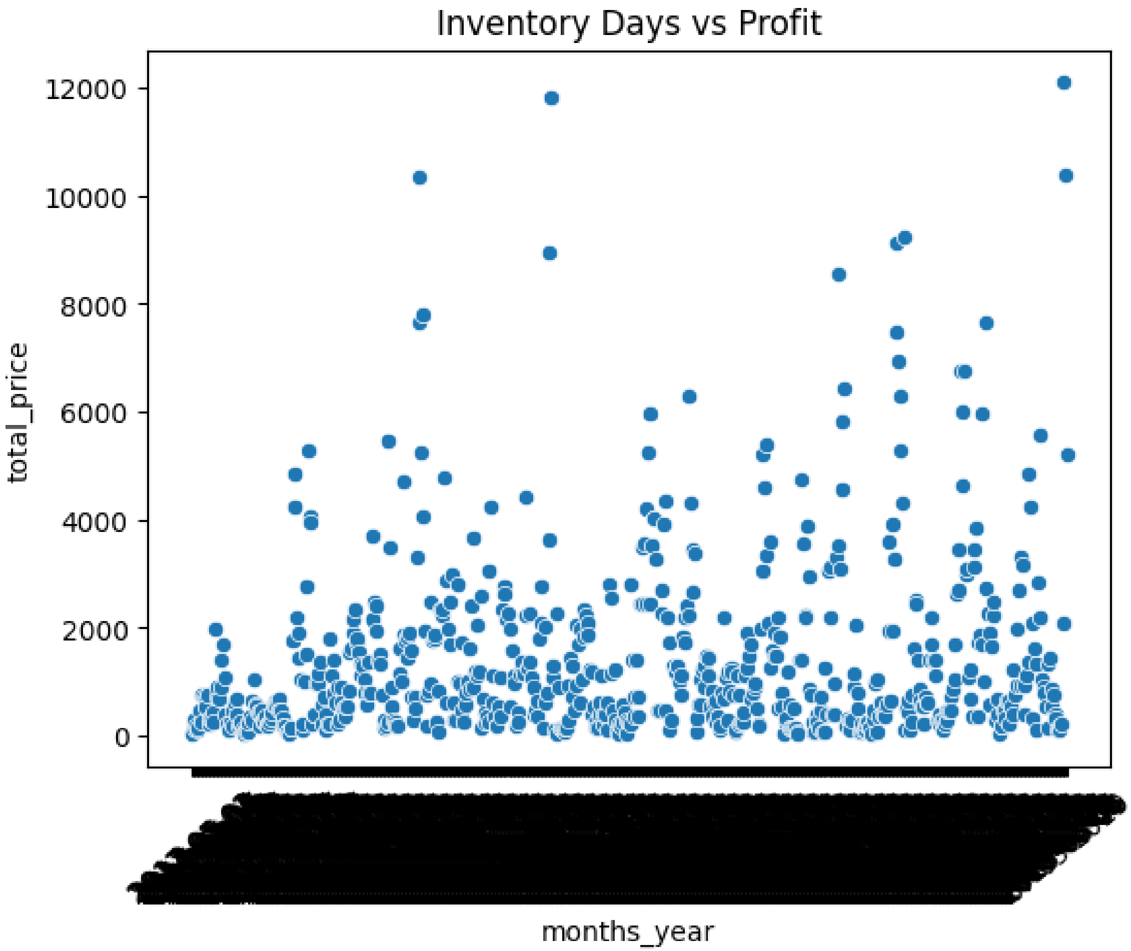
```
45.950000
3    14.656757  199.509804  4.4  19.412885   45.95  4.0  14.287500
45.950000
4    18.776522  163.398710  4.4  24.324687   45.95  4.0  15.100000
45.950000
..         ...         ...  ...        ...     ...  ...        ...
...
671  15.011897  215.000000  4.4   8.760000   45.95  4.0  15.100000
214.950000
672  14.769216  209.000000  4.4  21.322000   45.95  4.0  12.933333
215.000000
673  13.993833  205.000000  4.4  22.195932   45.95  4.0  14.840000
209.000000
674  14.656757  199.509804  4.4  19.412885   45.95  4.0  14.287500
205.000000
675  18.776522  163.398710  4.4  24.324687   45.95  4.0  15.100000
199.509804

[676 rows x 30 columns]
```

CORRELATION

```
df['months_year'] = pd.to_datetime(df['months_year'], errors='coerce')
df['days_numeric'] = (df['months_year'] -
df['months_year'].min()).dt.days
correlation = df['months_year'].corr(df['total_price'])
print("Correlation between Inventory Days and Profit Margin:",
correlation)

Correlation between Inventory Days and Profit Margin: -
0.02120273164256909

correlation = df["months_year"].corr(df["total_price"])
print("Correlation between Inventory Days and Profit Margin:",
correlation)

Correlation between Inventory Days and Profit Margin: -
0.02120273164256909
```

CORRELATION

```
import seaborn as sns
import matplotlib.pyplot as plt

sns.scatterplot(x="months_year", y="total_price", data=df)
plt.title("Inventory Days vs Profit")
plt.xticks(rotation=40)
plt.show()
```


Inventory Days vs Profit
total_price
12000
10000
8000
6000
4000
2000
0
months_year