Grocery sales analysis

- Done by : Lujain Yousef

In [8]:
```
import pandas as pd
sales = pd.read_csv('grocery_sales.csv')
sales.head()
```

Out[8]:

	storeID	product	quantity	revenue
0	A	Apples	1811	9300.6
1	A	Bananas	1003	3375.2
2	A	Oranges	1604	8528.5
3	B	Apples	1785	9181.0
4	B	Bananas	944	3680.2

In [3]:
```
sales['product'].unique()
```

Out[3]:
```
array(['Apples', 'Bananas', 'Oranges'], dtype=object)
```

EDA

In [175…
```
sales.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 78 entries, 0 to 77
Data columns (total 4 columns):
 #   Column    Non-Null Count  Dtype 
---  ------    --------------  ----- 
 0   storeID   78 non-null     object
 1   product   78 non-null     object
 2   quantity  78 non-null     int64 
 3   revenue   78 non-null     float64
dtypes: float64(1), int64(1), object(2)
memory usage: 2.6+ KB
```

In [176…
```
sales.describe()
```

Out[176]:

	quantity	revenue
count	78.000000	78.000000
mean	1162.923077	4740.384615
std	493.074815	2455.933504
min	284.000000	832.500000
25%	759.250000	2815.275000
50%	1131.500000	3951.900000
75%	1596.500000	7045.475000
max	1931.000000	10211.900000

In [177…
```
sales.describe(exclude='number')
```

Out[177]:

	storeID	product
count	78	78
unique	26	3
top	A	Apples
freq	3	26

In [178…
```
sales.isna().sum()
```

Out[178]:
```
storeID     0
product     0
quantity    0
revenue     0
dtype: int64
```

In [179…
```
sales.dtypes
```

Out[179]:
```
storeID      object
product      object
quantity      int64
revenue     float64
dtype: object
```

In [180…
```
sales['product'].unique()
```

Out[180]:
```
array(['Apples', 'Bananas', 'Oranges'], dtype=object)
```

feature generation

In [181…
```
sales['price'] = sales['revenue']/sales['quantity']
```

In [182…
```
sales
```

Out[182]:

	storeID	product	quantity	revenue	price
0	A	Apples	1811	9300.6	5.135616
1	A	Bananas	1003	3375.2	3.365105
2	A	Oranges	1604	8528.5	5.317020
3	B	Apples	1785	9181.0	5.143417
4	B	Bananas	944	3680.2	3.898517
...	...	...	...	...	...
73	Y	Bananas	902	3169.8	3.514191
74	Y	Oranges	1441	6856.1	4.757876
75	Z	Apples	1441	7209.0	5.002776
76	Z	Bananas	1199	4440.5	3.703503
77	Z	Oranges	973	3990.4	4.101131

78 rows × 5 columns

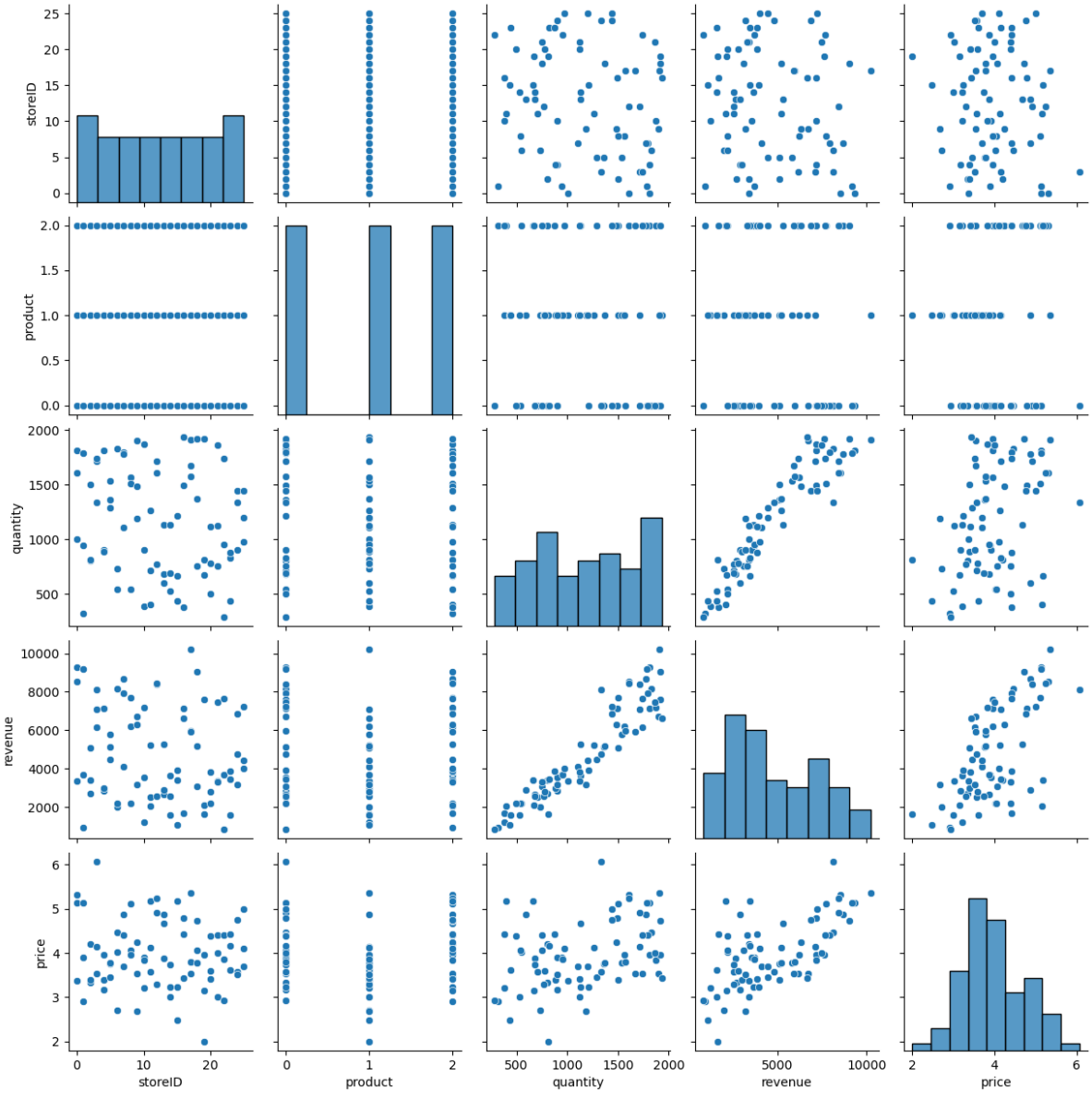
encoding categorical cols

In [183…
```
from sklearn.preprocessing import LabelEncoder
l = LabelEncoder()
sales['storeID'] = l.fit_transform(sales['storeID'])
sales['product'] =  l.fit_transform(sales['product'])
```

In [184…
```
sns.pairplot(sales)
```

```
C:\Users\yluja\Documents\adult.csv\Lib\site-packages\seaborn\axisgrid.py:118: User
Warning: The figure layout has changed to tight
  self._figure.tight_layout(*args, **kwargs)
```

Out[184]:
```
<seaborn.axisgrid.PairGrid at 0x1c51a447ad0>
```



In [198…
```
sales.var()
```

Out[198]:
```
storeID     5.698052e+01
product     6.753247e-01
quantity    2.431228e+05
revenue     6.031609e+06
price       5.880927e-01
dtype: float64
```

dependent and independent variables

In [186…
```
X = sales.drop('revenue',axis=1)
y = sales['revenue']
```

In [187…
```
from sklearn.model_selection import train_test_split
X_train,X_test,y_train,y_test =train_test_split(X,y,test_size=0.2)
```

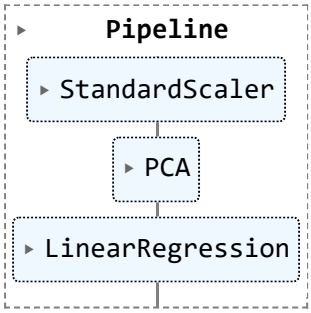
Dim reduction

- PCA

In [188…
```
from sklearn.pipeline import make_pipeline
from sklearn.linear_model import LinearRegression
from sklearn.preprocessing import StandardScaler
from sklearn.decomposition import PCA
model = LinearRegression()
pca = PCA(n_components=0.9)
scaler = StandardScaler()
pipe = make_pipeline(scaler,pca,model)
```

In [192…
```
pipe.fit(X_train,y_train)
```

Out[192]:



In [193…
```
test_acc = pipe.score(X_test,y_test )
```

In [194…
```
train_acc = pipe.score(X_train,y_train)
```

In [204…
```
print(f'{train_acc:.1%} test set accuracy')
print(f'{test_acc:.1%} test set accuracy')
```

```
98.0% test set accuracy
96.9% test set accuracy
```