Some analysis of Marine Buyer-Seller Transaction

From the SQL Mgmt Studio Server, the Les_SalesOrder Database was chosen, in which SM_QUOTATIONS_VENDOR, SM_QUOTATIONS_ITEMS, SM_QUOTATIONS_VENDOR_INVOICE tables were taken.

- Python libraries **NumPy** (numerical computing, array operations, scientific computations and data processing), **Pandas** (Provides data structures, reading and writing data, manipulation operations)

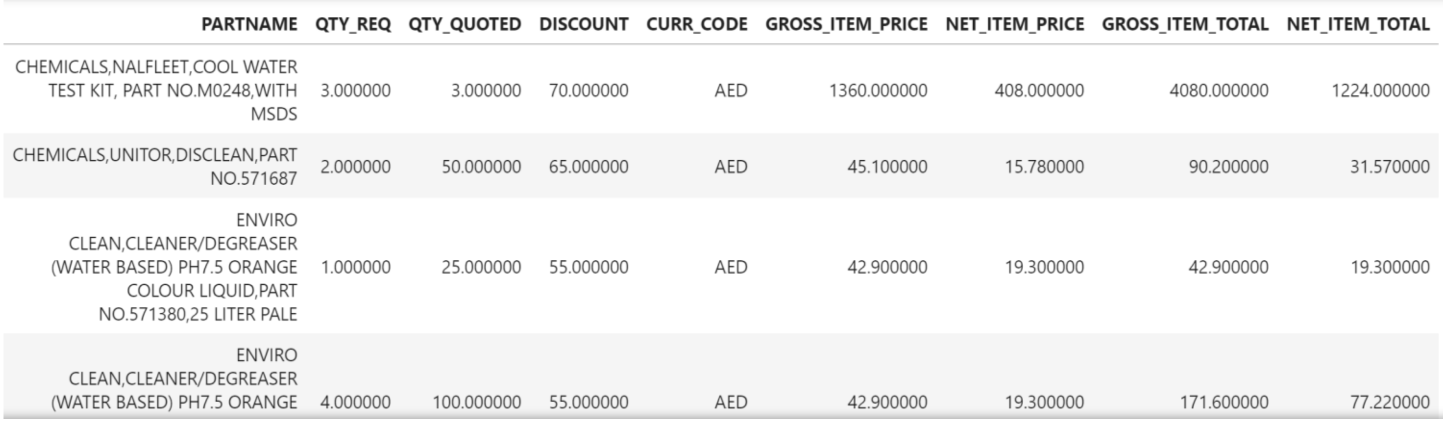
```
import pandas as pd
import numpy as np
```

- Now import the excel workbook with the required sheets.
- The rows containing null values are removed, the **isnull()** function is used to check the columns containing null values.

SHEET 1 ANALYSIS

- Drop the columns from the sheet which are not relevant for analysis.

```
columns_to_drop_sheet1 = ['VRNO', 'ITEM_MARKED_REMARK','DISCOUNT','DELIVERYTIME', 'ITEM_UNIT', 'EQUIP_TYPE', 'PART_NAME', 'CHANGED_BY_VENDOR', 'EQUIP_DETAILS', 'LIST_PRICE', 'UNIT_PRICE', 'QUOTATIONDETAILID', 'ITEMSTATUS', 'EQUIP_MODEL', 'EQUIP_SERNO', 'EQUIP_DRAWINGNO', 'ORIGINATINGSYSTEMREF', 'DOCID', 'QUOTEITEM_REMARK', 'ITEM_REMARK', 'UNIT_CODE', 'QUOTE_EXCHRATE', 'QUOTED_PRICE', 'QTY_ORD', 'QTY_QUOTED', 'QTY_REQ', 'EQUIP_MAKER', 'EQUIP_NAME', 'REFNO', 'POSNO', 'DRAWINGNO']

df_sheet1_mod = df_sheet1.drop(columns=columns_to_drop_sheet1)
```



PARTNAME	QTY_REQ	QTY_QUOTED	DISCOUNT	CURR_CODE	GROSS_ITEM_PRICE	NET_ITEM_PRICE	GROSS_ITEM_TOTAL	NET_ITEM_TOTAL
CHEMICALS,NALFLEET,COOL WATER TEST KIT, PART NO.M0248,WITH MSDS	3.000000	3.000000	70.000000	AED	1360.000000	408.000000	4080.000000	1224.000000
CHEMICALS,UNITOR,DISCLEAN,PART NO.571687	2.000000	50.000000	65.000000	AED	45.100000	15.780000	90.200000	31.570000
ENVIRO CLEAN,CLEANER/DEGREASER (WATER BASED) PH7.5 ORANGE COLOUR LIQUID,PART NO.571380,25 LITER PALE	1.000000	25.000000	55.000000	AED	42.900000	19.300000	42.900000	19.300000
ENVIRO CLEAN,CLEANER/DEGREASER (WATER BASED) PH7.5 ORANGE	4.000000	100.000000	55.000000	AED	42.900000	19.300000	171.600000	77.220000

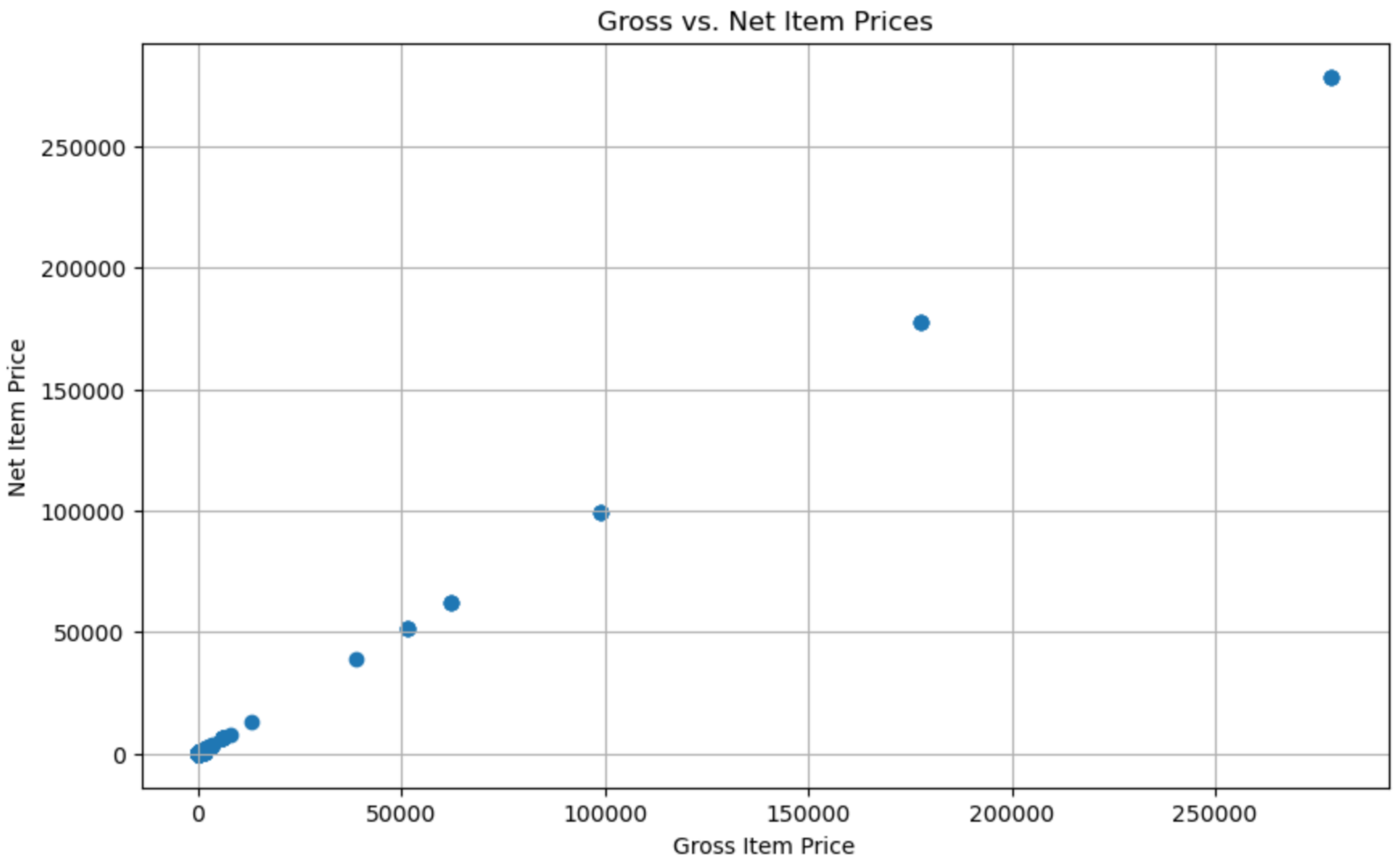
Using drop.() function we can drop the required columns

- Import the **matplotlib** library for visualization.

```
import matplotlib.pyplot as plt
```

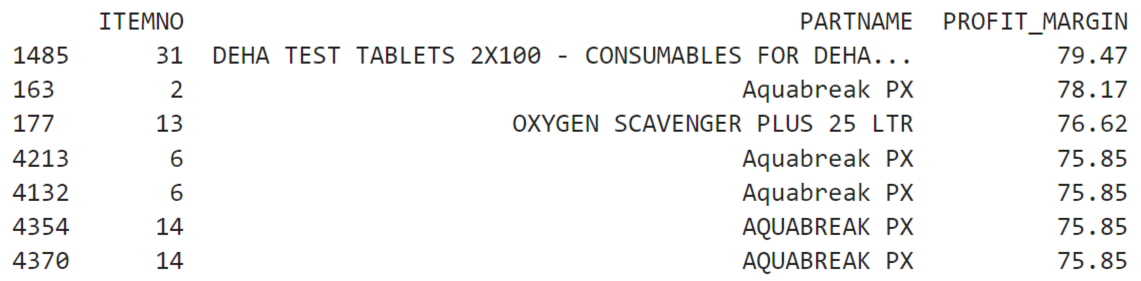
- GROSS_ITEM_PRICE: Price before any deductions or expenses are subtracted. It's the total amount charged for the item.
- NET_ITEM_PRICE: Price after deducting any discounts, taxes, or other expenses. It's the final amount paid for the item.

```
plt.figure(figsize=(10, 6))
plt.scatter(df_sheet1_mod['GROSS_ITEM_PRICE'], df_sheet1_mod['NET_ITEM_PRICE'])
plt.xlabel('Gross Item Price')
plt.ylabel('Net Item Price')
plt.title('Gross vs. Net Item Prices')
plt.grid(True)
plt.show()
```



- Now, let's check the top product items having high **'Profit Margin'**

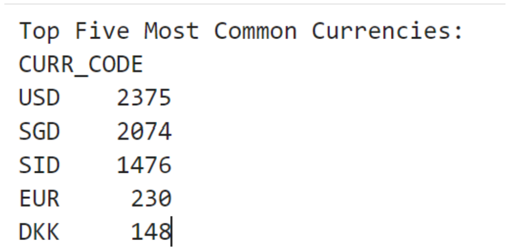
```
['PROFIT_MARGIN'] = (['GROSS_ITEM_PRICE'] - ['NET_ITEM_PRICE']) / ['GROSS_ITEM_PRICE']) * 100

top_items = df_sheet1_mod.sort_values (by='PROFIT_MARGIN', ascending=False).head(7)
print(top_items[['ITEMNO', 'PARTNAME', 'PROFIT_MARGIN']])
```



```
      ITEMNO                                    PARTNAME  PROFIT_MARGIN
1485      31  DEHA TEST TABLETS 2X100 - CONSUMABLES FOR DEHA...          79.47
163        2                                 Aquabreak PX          78.17
177       13                    OXYGEN SCAVENGER PLUS 25 LTR          76.62
4213       6                                 Aquabreak PX          75.85
4132       6                                 Aquabreak PX          75.85
4354      14                                 AQUABREAK PX          75.85
4370      14                                 AQUABREAK PX          75.85
```

- Commonly used currency for transaction

  currency_counts = df_sheet1_mod['CURR_CODE'].value_counts()



```
Top Five Most Common Currencies:
CURR_CODE
USD     2375
SGD     2074
SID     1476
EUR      230
DKK      148
```

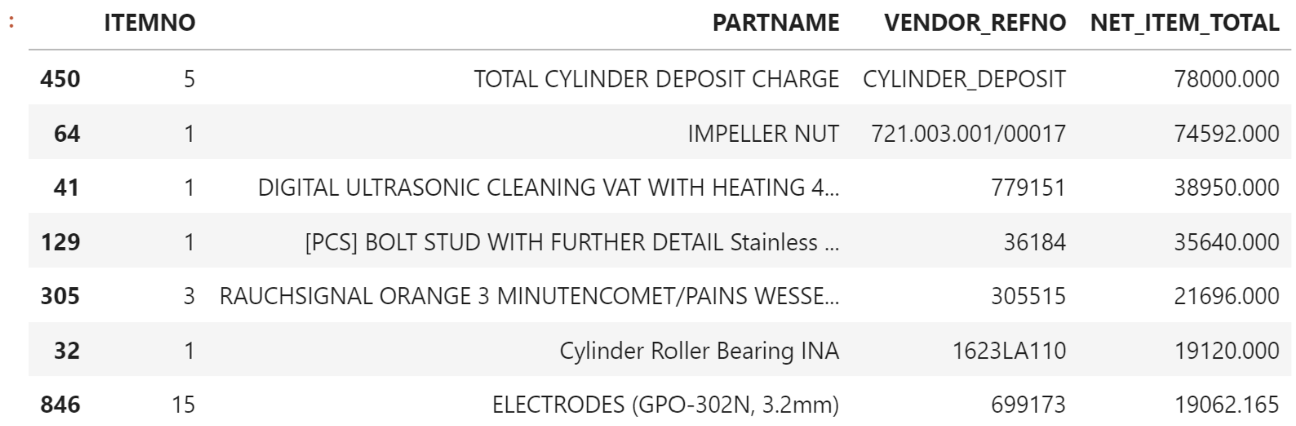
USD – United States
SGD – Singapore
SID – UAE
EUR – Europe
DKK – Denmark, Lowlands

Value.counts() function reads the values in CURR-CODE column and returns the frequency

- Products contributing to huge share of total revenue by NET

  net_revenue = df_sheet1_mod.groupby(['ITEMNO', 'PARTNAME', 'VENDOR_REFNO'])['NET_ITEM_TOTAL'].sum()

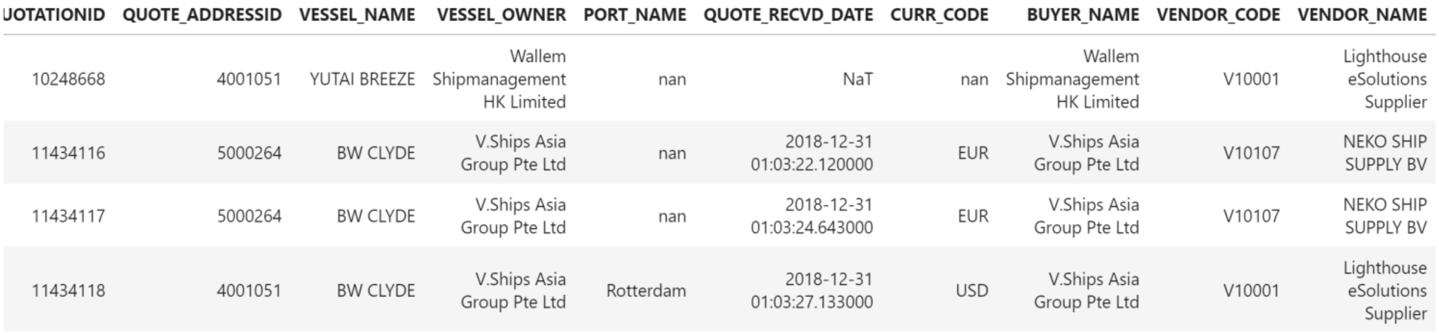
  net_revenue = net_revenue.sort_values(by='NET_ITEM_TOTAL', ascending=False)



:	ITEMNO	PARTNAME	VENDOR_REFNO	NET_ITEM_TOTAL
450	5	TOTAL CYLINDER DEPOSIT CHARGE	CYLINDER_DEPOSIT	78000.000
64	1	IMPELLER NUT	721.003.001/00017	74592.000
41	1	DIGITAL ULTRASONIC CLEANING VAT WITH HEATING 4...	779151	38950.000
129	1	[PCS] BOLT STUD WITH FURTHER DETAIL Stainless ...	36184	35640.000
305	3	RAUCHSIGNAL ORANGE 3 MINUTENCOMET/PAINS WESSE...	305515	21696.000
32	1	Cylinder Roller Bearing INA	1623LA110	19120.000
846	15	ELECTRODES (GPO-302N, 3.2mm)	699173	19062.165

SHEET 2 ANALYSIS

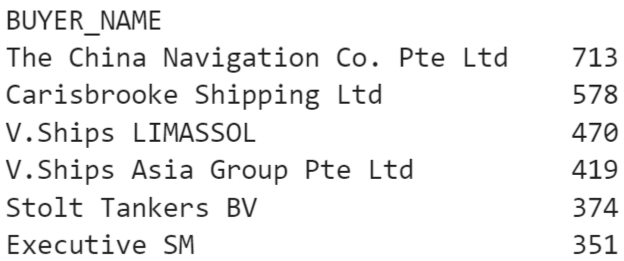
- Similarly, here remove the irrelevant columns from the dataframe



UOTATIONID	QUOTE_ADDRESSID	VESSEL_NAME	VESSEL_OWNER	PORT_NAME	QUOTE_RECVD_DATE	CURR_CODE	BUYER_NAME	VENDOR_CODE	VENDOR_NAME
10248668	4001051	YUTAI BREEZE	Wallem Shipmanagement HK Limited	nan	NaT	nan	Wallem Shipmanagement HK Limited	V10001	Lighthouse eSolutions Supplier
11434116	5000264	BW CLYDE	V.Ships Asia Group Pte Ltd	nan	2018-12-31 01:03:22.120000	EUR	V.Ships Asia Group Pte Ltd	V10107	NEKO SHIP SUPPLY BV
11434117	5000264	BW CLYDE	V.Ships Asia Group Pte Ltd	nan	2018-12-31 01:03:24.643000	EUR	V.Ships Asia Group Pte Ltd	V10107	NEKO SHIP SUPPLY BV
11434118	4001051	BW CLYDE	V.Ships Asia Group Pte Ltd	Rotterdam	2018-12-31 01:03:27.133000	USD	V.Ships Asia Group Pte Ltd	V10001	Lighthouse eSolutions Supplier

Top client's (buyer)

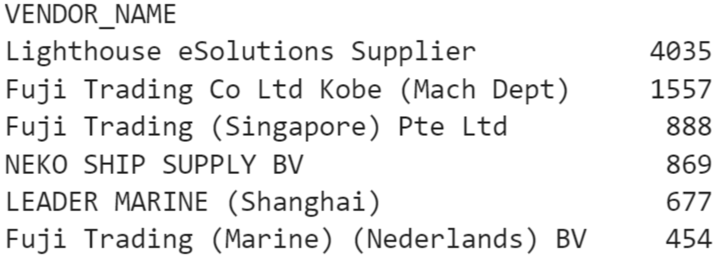
- **most_frequent_buyer = df_sheet2_mod['BUYER_NAME'].value_counts()**



```
BUYER_NAME
The China Navigation Co. Pte Ltd    713
Carisbrooke Shipping Ltd            578
V.Ships LIMASSOL                    470
V.Ships Asia Group Pte Ltd          419
Stolt Tankers BV                    374
Executive SM                        351
```

Biggest Vendor's (Seller)

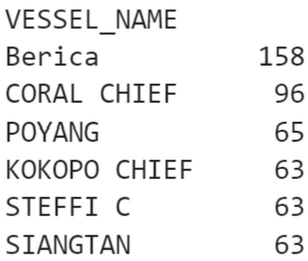
- **most_frequent_seller = df_sheet2_mod['VENDOR_NAME'].value_counts()**



```
VENDOR_NAME
Lighthouse eSolutions Supplier         4035
Fuji Trading Co Ltd Kobe (Mach Dept)   1557
Fuji Trading (Singapore) Pte Ltd        888
NEKO SHIP SUPPLY BV                     869
LEADER MARINE (Shanghai)                677
Fuji Trading (Marine) (Nederlands) BV   454
```

Busiest Vessesls

- **most_frequent_vessel = df_sheet2_mod['VESSEL_NAME'].value_counts()**



```
VESSEL_NAME
Berica          158
CORAL CHIEF      96
POYANG           65
KOKOPO CHIEF     63
STEFFI C         63
SIANGTAN         63
```