```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns

data = pd.read_excel('gee.xlsx', header=[1])

df = pd.DataFrame(data)
df
```

```
                               Name     Ticker  \
0           Reliance Industries Ltd   RELIANCE
1     Tata Consultancy Services Ltd        TCS
2                     HDFC Bank Ltd   HDFCBANK
3                       Infosys Ltd       INFY
4                    ICICI Bank Ltd  ICICIBANK
...                             ...        ...
1995            Galaxy Bearings Ltd    GALXBRG
1996           Signet Industries Ltd     SIGIND
1997                      Suraj Ltd   SURAJLTD
1998                     Polson Ltd     POLSON
1999                LKP Finance Ltd     LKPFIN

                              Sub-Sector    Market Cap  Close Price   PE
Ratio  \
0     Oil & Gas - Refining & Marketing  1.679534e+06      2467.40
34.186904
1             IT Services & Consulting  1.358569e+06      3626.70
41.892356
2                        Private Banks  8.206363e+05      1486.50
25.779258
3             IT Services & Consulting  7.775010e+05      1853.05
40.178853
4                        Private Banks  5.002790e+05       710.75
27.212283
...                                ...           ...          ...
...
1995                   Heavy Machinery  1.256577e+02       385.05
15.986985
1996                  Plastic Products  1.255488e+02        43.00
8.999914
1997                     Iron & Steel  1.255056e+02        64.95
91.609935
1998               Commodity Chemicals  1.253262e+02     10440.00
14.692403
1999    Investment Banking & Brokerage  1.249950e+02       100.70
2.061602

     Return on Equity Return on Assets  Net Profit Margin  \
0            7.793277         3.957021           9.725370
1            37.74068        25.932382          19.383065
```

```
2          16.4352        1.883433         20.420916
3         27.135305      19.417895         18.847214
4         12.382897       1.243333         11.395012
...             ...            ...               ...
1995       18.97634      14.784163         12.419024
1996        7.11771       2.017514          1.679812
1997        1.54881        0.76798          0.712132
1998       8.487562        4.80009          9.212658
1999      30.499522      24.118384         62.350884

      5Y Avg EBITDA Margin  ... Earnings Per Share     EBITDA  \
0                17.720494  ...          74.653049  103222.00
1                29.072528  ...          87.043624   48462.00
2                28.206116  ...          57.899268   44181.15
3                28.656802  ...          45.607423   30090.00
4                11.900543  ...          27.461218   27368.40
...                    ...  ...                ...        ...
1995             16.395699  ...          24.716981      12.27
1996              7.751415  ...           4.738934      65.98
1997              9.181438  ...           0.711167      17.65
1998             21.724728  ...         710.833333      19.62
1999             13.740886  ...          48.239175      69.56

      Long Term Investments  Reserves & Surplus  Cash and
Equivalent  \
0                 212382.00           579376.00            169843.00

1                    213.00            86063.00             38489.00

2                 438823.11           148746.23            121272.52

3                  11863.00            73627.00             27056.00

4                 536578.62           107231.52            147570.54

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

1995                   0.00               42.18                 7.65

1996                   0.14              144.17                20.66

1997                   0.00               47.98                 0.42

1998                   0.99              103.96                 6.63

1999                 204.91              236.96                29.74


      Book Value  Free Cash Flow  Operating Cash Flow  Unnamed: 44  \
```

```
0      799432.00       -79652.00            26185.00         NaN
1       87108.00        35727.00            38802.00         NaN
2      210442.95        40780.31            42476.46         NaN
3       76782.00        21117.00            23224.00         NaN
4      167175.84       136327.09           138015.30         NaN
...          ...             ...                 ...         ...
1995       45.36            1.31                6.76         NaN
1996      202.67           -8.33                6.96         NaN
1997       89.14           30.05               32.51         NaN
1998      104.77           13.20               22.41         NaN
1999      253.23          -13.07              -13.03         NaN

      Unnamed: 45
0             NaN
1             NaN
2             NaN
3             NaN
4             NaN
...           ...
1995          NaN
1996          NaN
1997          NaN
1998          NaN
1999          NaN

[2000 rows x 46 columns]
```

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2000 entries, 0 to 1999
Data columns (total 46 columns):
 #   Column                          Non-Null Count  Dtype
---  ------                          --------------  -----
 0   Name                            2000 non-null   object
 1   Ticker                          2000 non-null   object
 2   Sub-Sector                      1947 non-null   object
 3   Market Cap                      2000 non-null   float64
 4   Close Price                     2000 non-null   float64
 5   PE Ratio                        1957 non-null   float64
 6   Return on Equity                1870 non-null   object
 7   Return on Assets                1952 non-null   object
 8   Net Profit Margin               1953 non-null   float64
 9   5Y Avg EBITDA Margin            1880 non-null   float64
 10  EBITDA Margin                   1953 non-null   object
 11  1Y Return vs Nifty              2000 non-null   float64
 12  5Y CAGR                         1593 non-null   float64
 13  Debt to Equity                  1835 non-null   float64
 14  Long Term Debt to Equity        1833 non-null   float64
 15  Net Income / Liabilities        1557 non-null   float64
```

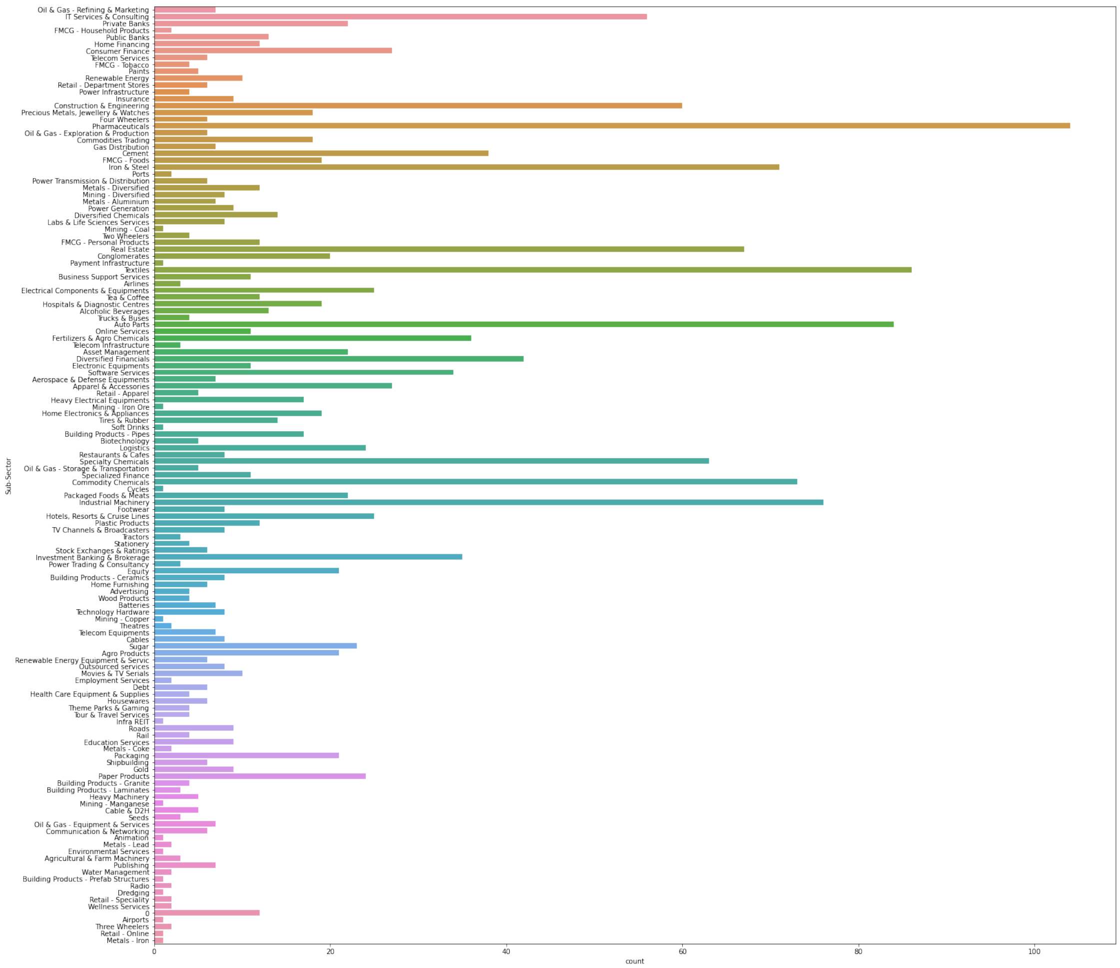
```
 16  5Y Historical Revenue Growth    1871 non-null   float64
 17  5Y Historical EBITDA Growth     1624 non-null   float64
 18  5Y Hist Op. Cash Flow Growth    1273 non-null   float64
 19  5Y Historical EPS Growth        1329 non-null   float64
 20  Forward PE Ratio                531 non-null    float64
 21  Enterprise Value                1999 non-null   float64
 22  PB Ratio                        1954 non-null   float64
 23  Dividend Yield                  1098 non-null   float64
 24  PE Premium vs Sector            1957 non-null   float64
 25  Domestic Institutional Holding  1960 non-null   float64
 26  Mutual Fund Holding             1960 non-null   float64
 27  Promoter Holding                1960 non-null   float64
 28  Foreign Institutional Holding   1960 non-null   float64
 29  Retail Investor Holding         1958 non-null   float64
 30  Pledged Promoter Holdings       1960 non-null   float64
 31  Insurance Firms Holding         1960 non-null   float64
 32  No. of Shareholders             1950 non-null   float64
 33  Total Revenue                   1959 non-null   float64
 34  Net Income                      1959 non-null   object
 35  PBT                             1959 non-null   object
 36  Earnings Per Share              1959 non-null   object
 37  EBITDA                          1959 non-null   float64
 38  Long Term Investments           1954 non-null   float64
 39  Reserves & Surplus              1954 non-null   float64
 40  Cash and Equivalent             1954 non-null   float64
 41  Book Value                      1953 non-null   float64
 42  Free Cash Flow                  1954 non-null   float64
 43  Operating Cash Flow             1954 non-null   float64
 44  Unnamed: 44                     0 non-null      float64
 45  Unnamed: 45                     1 non-null      object
dtypes: float64(36), object(10)
memory usage: 718.9+ KB
```

```
df["Sub-Sector"].unique
```

```
<bound method Series.unique of 0       Oil & Gas - Refining & 
Marketing
1                IT Services & Consulting
2                           Private Banks
3                IT Services & Consulting
4                           Private Banks
                       ...
1995                      Heavy Machinery
1996                     Plastic Products
1997                         Iron & Steel
1998                  Commodity Chemicals
1999      Investment Banking & Brokerage
Name: Sub-Sector, Length: 2000, dtype: object>
```

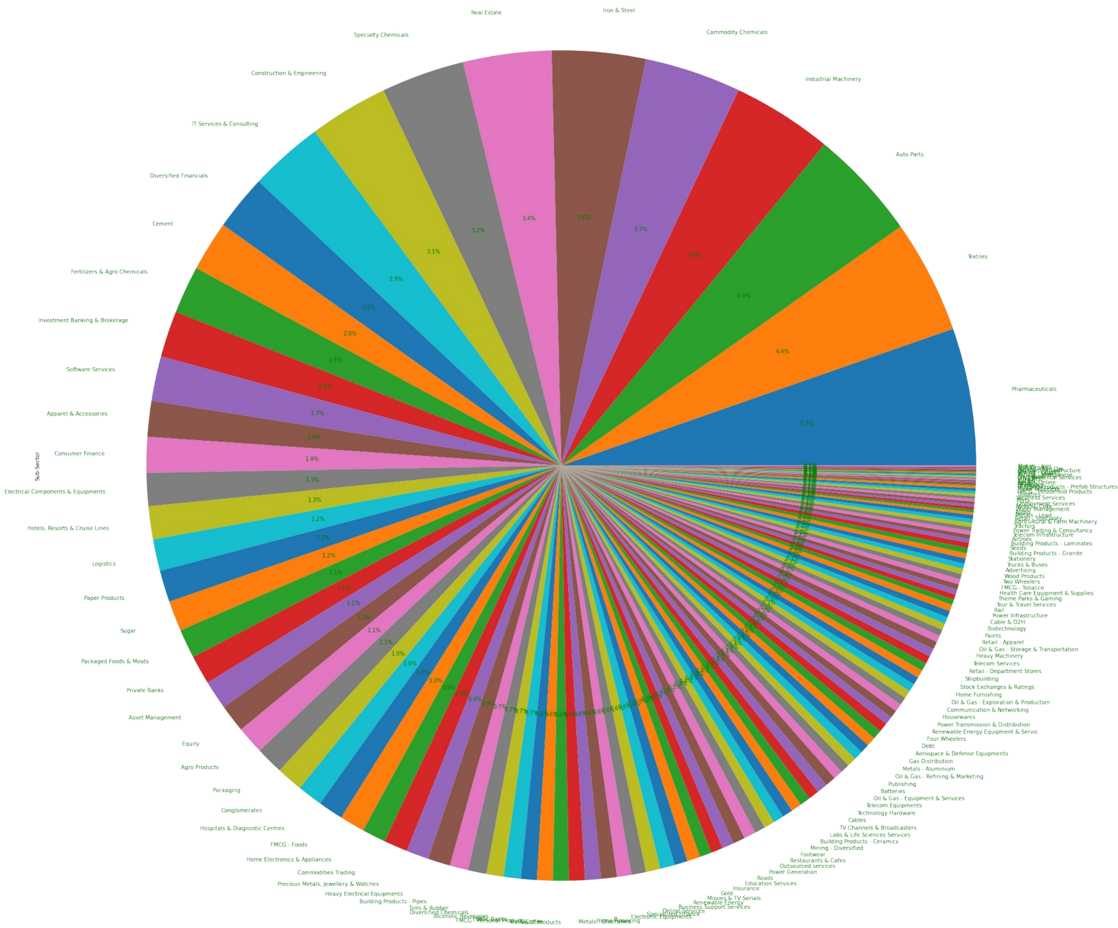
```
plt.figure(figsize=(25,25))
sns.countplot(y='Sub-Sector',data=df,orient="h" )
```

```
<AxesSubplot:xlabel='count', ylabel='Sub-Sector'>
```



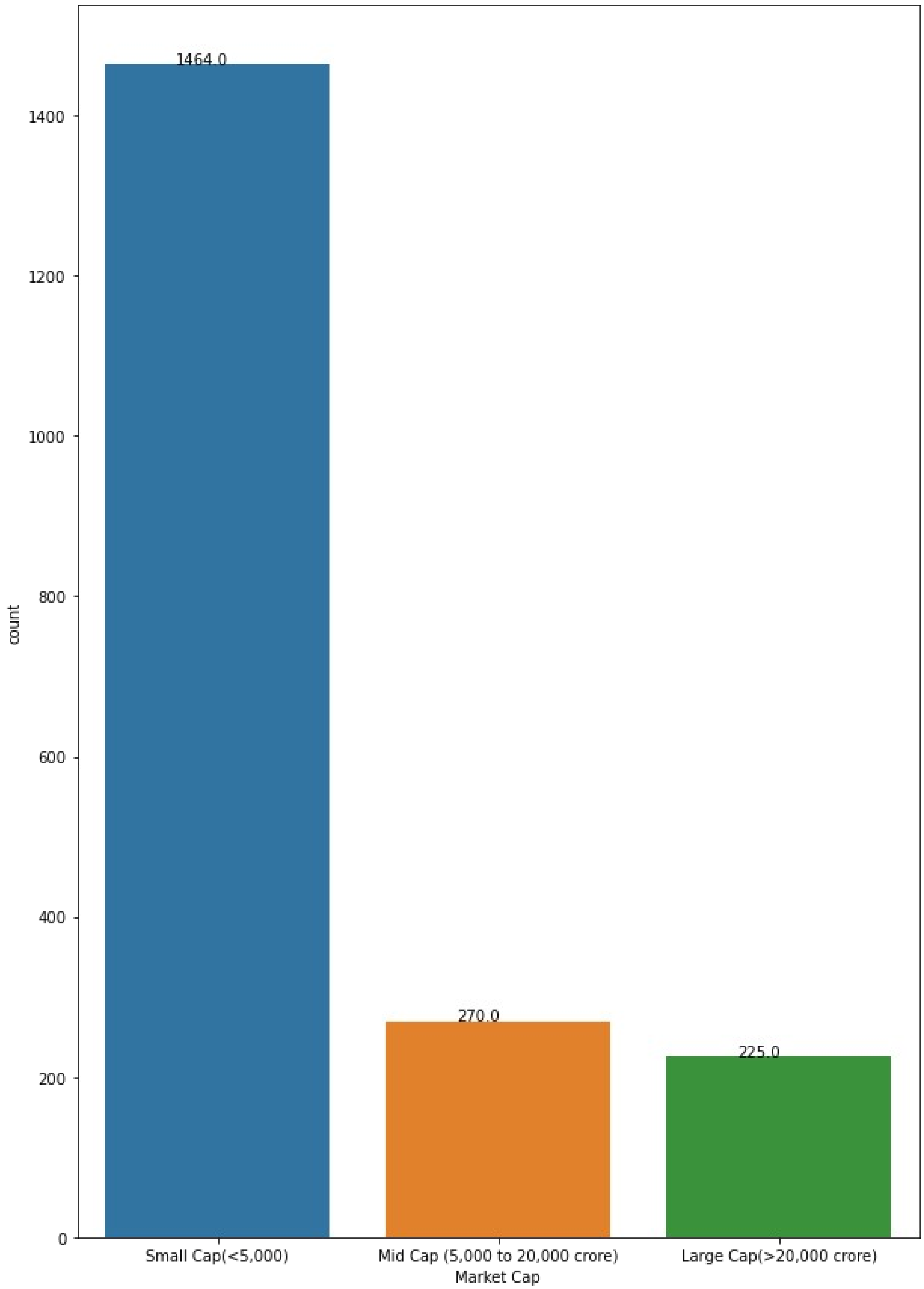

```python
count_val= df["Sub-Sector"].value_counts()

plt.figure(figsize=(35,35))
count_val.plot(kind="pie",textprops={'color':"green"}, autopct='%.1f%
%')
```

```
<AxesSubplot:ylabel='Sub-Sector'>
```



```
#Secondly, visualise the companies by segregating them according to
Market Cap in
#three categories: Large Cap(>20,000 crore)
#Mid Cap (5,000 to 20,000 crore) &
#Small Cap(<5,000)

df = df.dropna(subset=["Market Cap", "Earnings Per Share"])

plt.figure(figsize=(10,15))
cat= pd.cut(df["Market Cap"],bins=[0,5000,20000,np.inf],labels=["Small
Cap(<5,000)","Mid Cap (5,000 to 20,000 crore)","Large Cap(>20,000
crore)"])
ax=sns.countplot(cat)
for p in ax.patches:
    ax.annotate('{:.1f}'.format(p.get_height()), (p.get_x()+0.25,
p.get_height()+0.01))

plt.show()
```

```
C:\Users\gargi\anaconda3\lib\site-packages\seaborn\_decorators.py:36:
FutureWarning: Pass the following variable as a keyword arg: x. From
version 0.12, the only valid positional argument will be `data`, and
passing other arguments without an explicit keyword will result in an
error or misinterpretation.
  warnings.warn(
```



V : Intrinsic Value EPS : The Company’s last 12 month earnings per share 8.5 : The constant represents the appropriate P-E ratio for a no-growth company as proposed by Graham. g : The company's long-term (five years) earnings growth estimate 6 : The average Return of

FDs (6%) Y : The current yield on AAA corporate bonds. The current yield is equal to the annual interest earned divided by the current price of the bond. =7.232% in India

```
df_rand = df.sample(10)
df_rand=df_rand.reset_index()
df_rand
```

```
   index                               Name      Ticker  \
0   1754              Add-Shop E-Retail Ltd        ASRL
1   1981  Maha Rashtra Apex Corporation Ltd  MAHAPEXLTD
2    117                    Canara Bank Ltd       CANBK
3   1098                 Ncl Industries Ltd      NCLIND
4   1669                           T T Ltd          TTL
5   1825                Indian Acrylics Ltd  INDIANACRY
6    259                 Gillette India Ltd    GILLETTE
7   1844                   U. P. Hotels Ltd       UPHOT
8   1224              Aarti Surfactants Ltd   AARTISURF
9    299            Brigade Enterprises Ltd     BRIGADE

                      Sub-Sector    Market Cap  Close Price    PE 
Ratio  \
0        FMCG - Personal Products    196.514634        99.85    
25.554569
1               Consumer Finance    130.068237        91.35    
3.857302
2                   Public Banks  41008.414346       224.95    
14.186866
3                         Cement    813.737892       174.60    
5.594623
4                       Textiles    228.416781       110.10  -
30.015346
5                       Textiles    172.671079        12.90    
27.451682
6        FMCG - Personal Products  15871.330000      4901.50    
51.135157
7  Hotels, Resorts & Cruise Lines    167.400000       325.50  -
21.796875
8            Specialty Chemicals    581.729386       777.90    
26.882134
9                    Real Estate  12184.347754       521.85 -
263.047231

  Return on Equity Return on Assets  Net Profit Margin  ...  \
0         46.71932        19.707842           9.787451  ...
1        25.541585        13.797901          93.953748  ...
2         5.498606         0.299895           3.086267  ...
3        24.381249        11.863107           8.277703  ...
4       -10.679203        -2.023425          -1.927168  ...
5         4.334941         1.054652           1.178543  ...
6        36.509066        22.597249          15.206134  ...
```

```
7        -8.221378        -6.448092         -21.682665  ...
8        15.362772         6.698031           4.645472  ...
9        -1.886608        -0.355428          -2.301089  ...

   Earnings Per Share       EBITDA  Long Term Investments  Reserves &
Surplus  \
0            3.992194    11.480000                   0.00
8.97
1           23.884741    32.170000                 235.99
124.79
2           21.595971  4719.570000              286191.25
30606.49
3           32.155876   290.780000                   0.00
407.24
4           -3.539856    14.310000                   0.00
30.62
5            0.464817    66.199999                   0.00
12.77
6           95.251782   492.230000                   0.00
723.52
7          -14.222222    -4.069999                   0.00
84.43
8           28.531961    45.570000                   0.00
125.07
9           -2.231214   458.640000                  37.71
847.91

   Cash and Equivalent  Book Value  Free Cash Flow  Operating Cash
Flow  \
0                 0.52       20.30           -0.84
0.58
1                 7.66      148.90            0.86
0.87
2            178866.37    63202.97        58194.95
59117.67
3                70.94      664.70           95.11
240.56
4                 2.54       68.14           39.73
40.14
5                10.91      148.48            4.44
11.23
6               166.32      789.01          352.99
443.16
7                34.38       89.83           -2.13                -
0.54
8                 6.73      152.07          -25.66
35.83
9               610.71     2463.31          307.52
802.88
```

```
   Unnamed: 44  Unnamed: 45
0          NaN          NaN
1          NaN          NaN
2          NaN          NaN
3          NaN          NaN
4          NaN          NaN
5          NaN          NaN
6          NaN          NaN
7          NaN          NaN
8          NaN          NaN
9          NaN          NaN

[10 rows x 47 columns]
```

```
def good(EPS,Y):
    g = 15
    return (EPS * (8.5 + 2*g) * 6) / Y

def bad(EPS,Y):
    g= -5
    return (EPS * (8.5 + 2*g) * 6) / Y

def best(EPS,Y):
    g= 25
    return (EPS * (8.5 + 2*g) * 6) / Y


V_good=[]
V_Bad=[]
V_best=[]
for i in range(10):
    V_good.append(good( df_rand.loc[i,"Earnings Per Share"],7.232))
    V_Bad.append(bad( df_rand.loc[i, "Earnings Per Share"],7.232))
    V_best.append(best(df_rand.loc[i, "Earnings Per Share"],7.232))


data_plot = {'Name':df_rand["Name"],'V_Good': V_good ,
'V_Bad':V_Bad,'V_Best': V_best,'Earnings Per Share':df_rand["Earnings
Per Share"]}
df_plot = pd.DataFrame(data=data_plot)
df_plot
```

```
                                Name       V_Good       V_Bad
V_Best  \
0              Add-Shop E-Retail Ltd   127.516150   -4.968162
193.758306
1  Maha Rashtra Apex Corporation Ltd   762.911398  -29.723821
1159.229007
2                    Canara Bank Ltd   689.804932  -26.875517
1048.145156
```

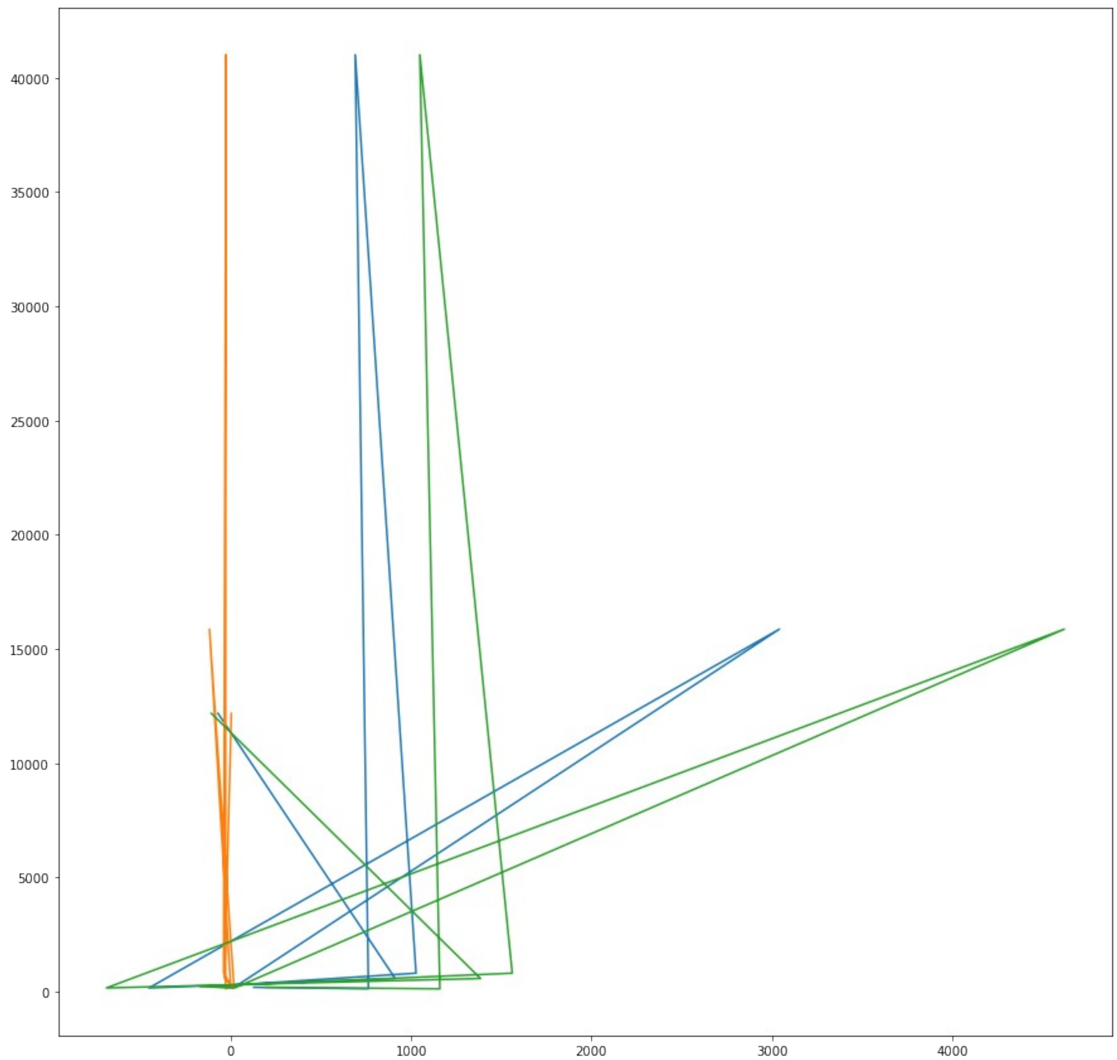
```
3                Ncl Industries Ltd  1027.102797  -40.016992
1560.662691
4                           T T Ltd  -113.067854    4.405241  -
171.804402
5               Indian Acrylics Ltd    14.846883   -0.578450
22.559549
6                Gillette India Ltd  3042.472586 -118.537893
4622.977825
7                  U. P. Hotels Ltd  -454.277286   17.699115  -
690.265487
8             Aarti Surfactants Ltd   911.349963  -35.507141
1384.778515
9           Brigade Enterprises Ltd   -71.268032    2.776677  -
108.290386

  Earnings Per Share
0           3.992194
1          23.884741
2          21.595971
3          32.155876
4          -3.539856
5           0.464817
6          95.251782
7         -14.222222
8          28.531961
9          -2.231214
```

```
df_plot.sort_values(by=["Earnings Per Share"])
```

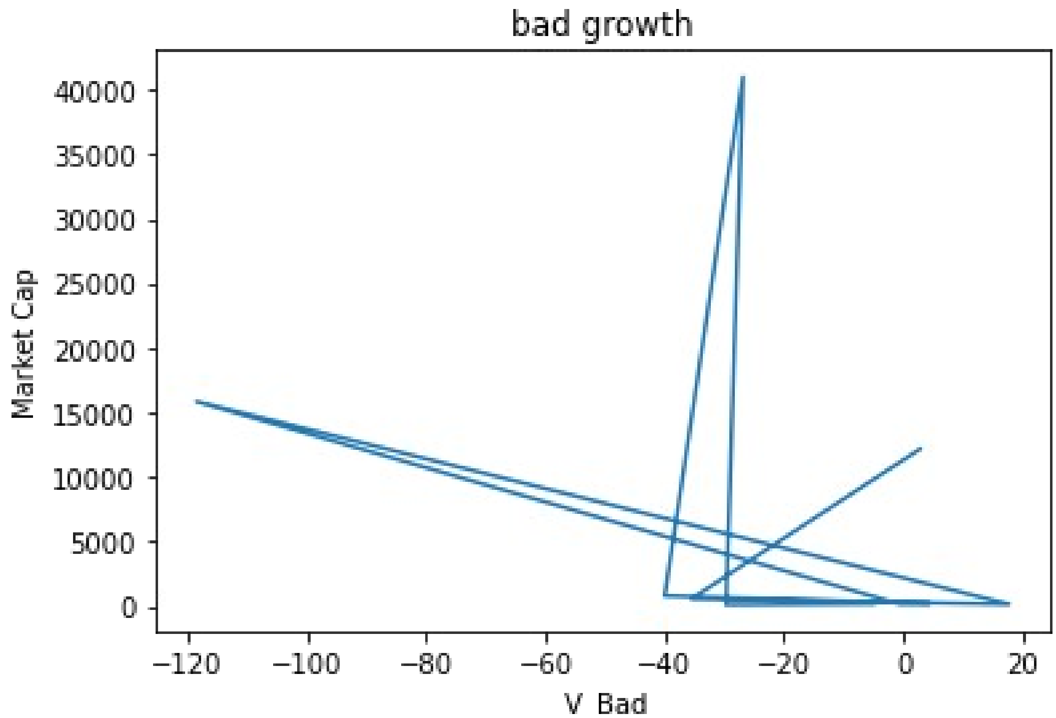
```
                                Name       V_Good       V_Bad
V_Best  \
7                  U. P. Hotels Ltd  -454.277286   17.699115  -
690.265487
4                           T T Ltd  -113.067854    4.405241  -
171.804402
9           Brigade Enterprises Ltd   -71.268032    2.776677  -
108.290386
5               Indian Acrylics Ltd    14.846883   -0.578450
22.559549
0             Add-Shop E-Retail Ltd   127.516150   -4.968162
193.758306
2                  Canara Bank Ltd   689.804932  -26.875517
1048.145156
1  Maha Rashtra Apex Corporation Ltd   762.911398  -29.723821
1159.229007
8             Aarti Surfactants Ltd   911.349963  -35.507141
1384.778515
3                Ncl Industries Ltd  1027.102797  -40.016992
1560.662691
6                Gillette India Ltd  3042.472586 -118.537893
```

```
4622.977825

   Earnings Per Share
7          -14.222222
4           -3.539856
9           -2.231214
5            0.464817
0            3.992194
2           21.595971
1           23.884741
8           28.531961
3           32.155876
6           95.251782
```

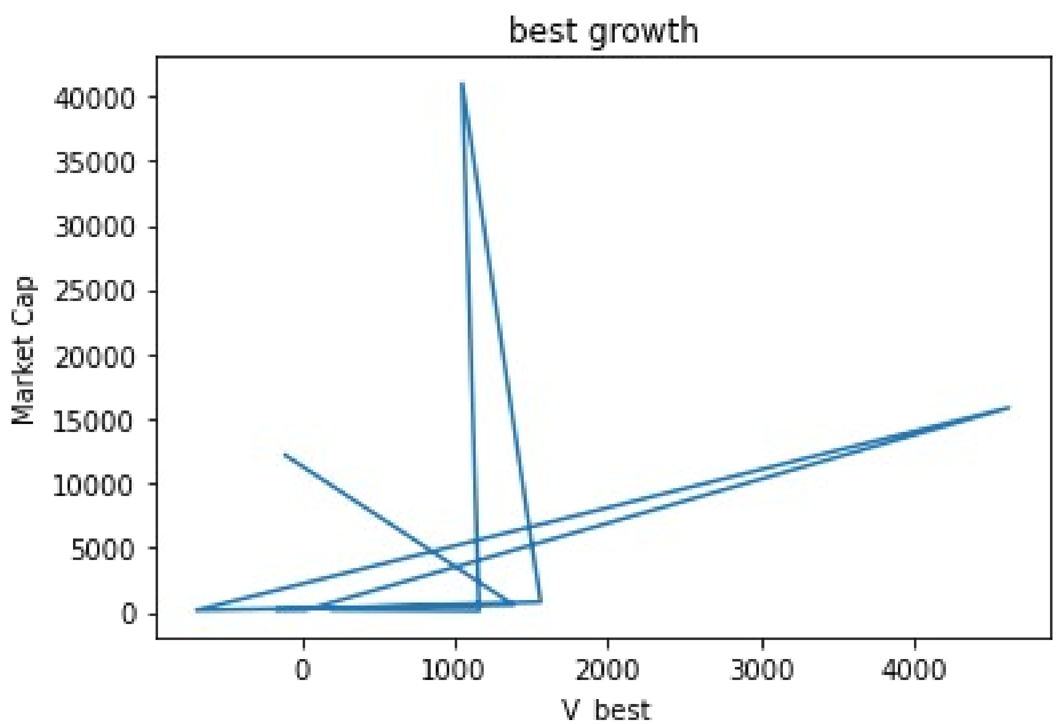
```python
plt.figure(figsize=(15,15))
plt.plot(  V_good,df_rand["Market Cap"])
plt.plot( V_Bad, df_rand["Market Cap"])
plt.plot( V_best, df_rand["Market Cap"])# Plot the chart
plt.show()
```




```
plt.plot( V_Bad, df_rand["Market Cap"])  # Plot the chart

plt.xlabel(" V_Bad")  # add X-axis label
plt.ylabel("Market Cap")  # add Y-axis label
plt.title("bad growth")  # add title
plt.show()
```




```
plt.plot( V_best, df_rand["Market Cap"])
plt.xlabel(" V_best")  # add X-axis label
plt.ylabel("Market Cap")  # add Y-axis label
plt.title("best growth")  # add title
plt.show()
```



```
plt.plot( V_good, df_rand["Market Cap"])
plt.xlabel(" V_good")  # add X-axis label
plt.ylabel("Market Cap")  # add Y-axis label
plt.title("good growth")  # add title
plt.show()
```