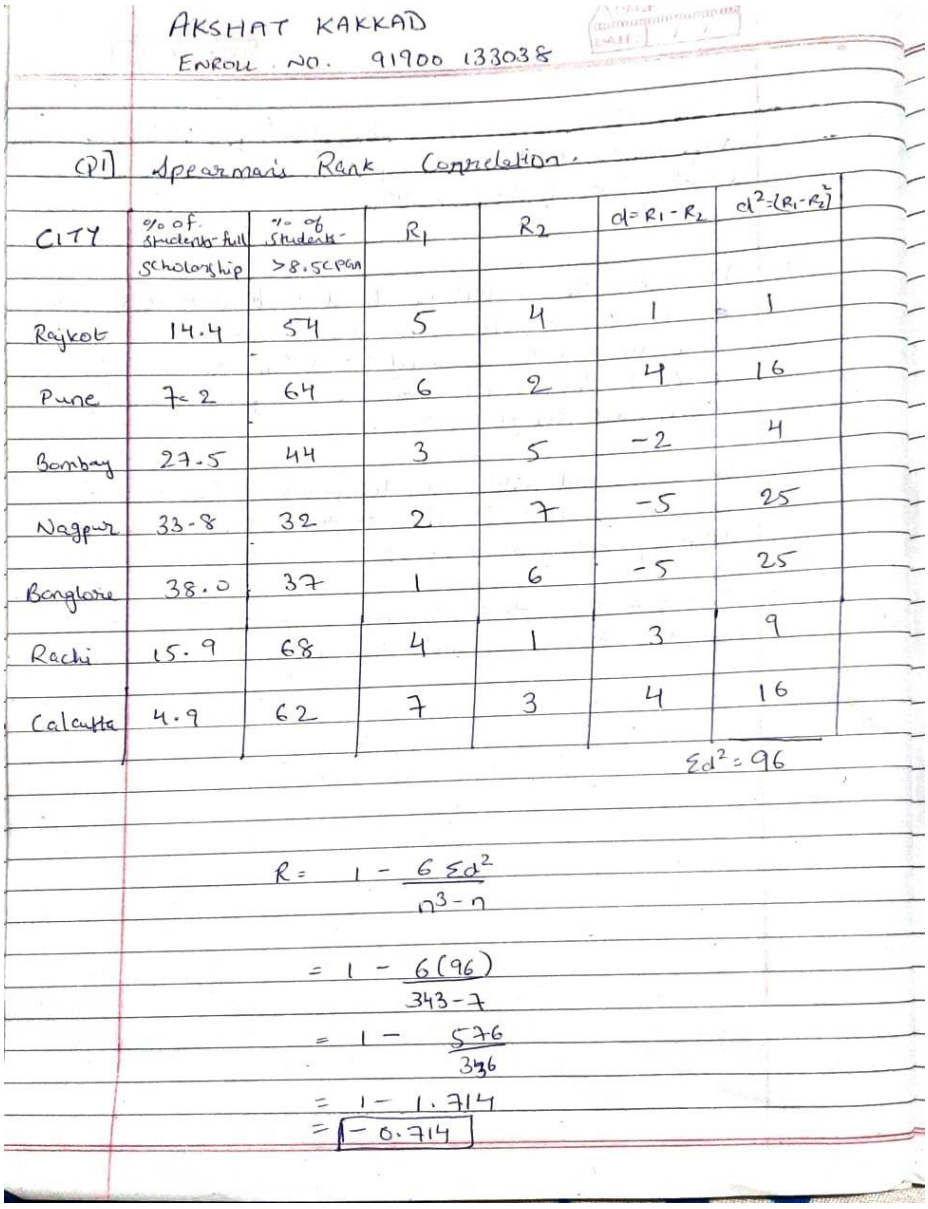
AKSHAT KAKKAD

91900133038

PS CLASS TEST – 2

Q1.



AKSHAT KAKKAD
ENROLL NO. 91900133038

(Q1) Spearman's Rank Correlation.

CITY	% of students full scholarship	% of students >8.5 CPGA	R_1	R_2	$d = R_1 - R_2$	$d^2 = (R_1 - R_2)^2$
Rajkot	14.4	54	5	4	1	1
Pune	7.2	64	6	2	4	16
Bombay	27.5	44	3	5	-2	4
Nagpur	33.8	32	2	7	-5	25
Banglore	38.0	37	1	6	-5	25
Rachi	15.9	68	4	1	3	9
Calcutta	4.9	62	7	3	4	16

$\Sigma d^2 = 96$

$$R = 1 - \frac{6 \Sigma d^2}{n^3 - n}$$

$$= 1 - \frac{6(96)}{343 - 7}$$

$$= 1 - \frac{576}{336}$$

$$= 1 - 1.714$$

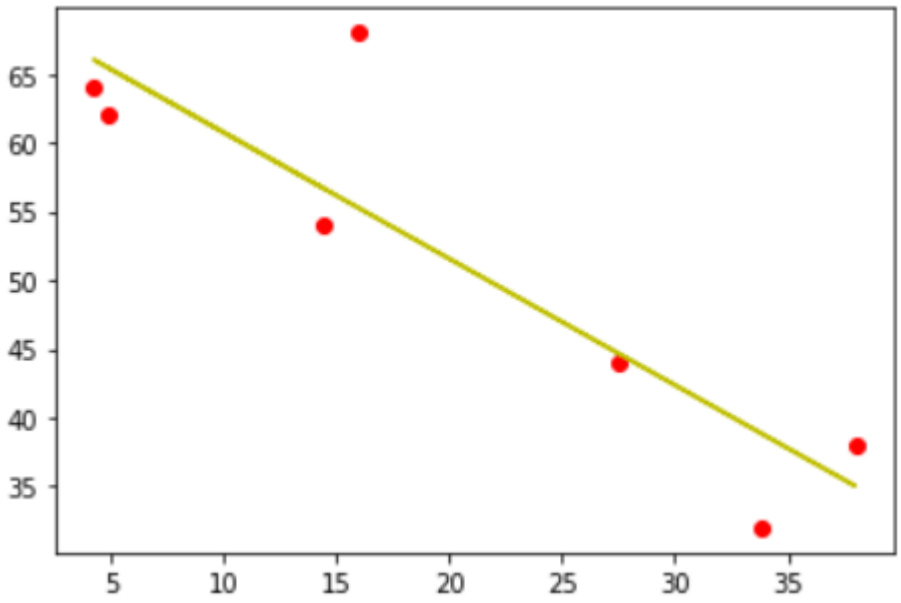
$$= \boxed{-0.714}$$

DATE: / /

∴ we get R = -0.714

∴ we can interpret the relation of the result to be strong negative relation.

To verify the result code is performed in python for regression line to determine the strong negative relation.



Here we can clearly see that most of the scatter points plotted are very near to the regression line and slope of the line is found to be negative. Therefore, our interpretation for the result to be strong negative relation (R = -0.714) is found to be true.

Q2.

1)

(Q2]

DATABASE NAME - S&P 500 Companies with Finiancial Information

1)	Company Name	Share Price
	3M Company	222.89
	A.O Smith Corp.	58.59
	Abbott Laboratories	58.59
	Abbvie Inc.	108.48
	Accenture plc	147.98
	Activision Blizzard	65.83
	Acuty Brands Inc.	147.98
	Adobe systems Inc	147.98
	Advanced Autoparts	115.23
	Advanced Micro Inc	11.22

$$\text{MEAN} = \frac{\sum_{0}^{n} x_1 + x_2 \cdots x_n}{n}$$

PAGE
DATE: / /

MEAN = (222.89 + 58.59 + ~~58.59~~ + 58.59 + 108.48 + 147.98 + 65.83 + 147.98 + 147.98 + 115.23 + 11.22) / 10

$= \frac{1084.77}{10}$

MEAN = 108.477

MEDIAN :- Arranging data is ascending or descending order and finding mid value

Even :- $\frac{n^{th} + n+1^{th}}{2}$ term value

MEDIAN = **111.855**

MODE :- Value repeated maximum number of times

i) 58.59 → repeated 2 times
ii) 147.98 → repeated 3 times
iii) Other all unique values

∴ **MODE = 147.98**

2)

2)	Stock price	price/Earnings
	222.89	24.31
	58.59	27.76
	58.59	22.51
	108.48	19.41
	147.98	25.47
	65.83	31.80
	147.98	18.22
	147.98	52.31
	115.23	19.94
	11.22	3.87

x_i	y_i	$x_i - \bar{x}$	$y_i - \bar{y}$
222.89	24.31	114.413	-0.25
58.59	27.76	-49.887	3.2
58.59	22.51	-49.887	-2.05
108.48	19.41	0.003	-5.145
147.98	25.47	39.503	0.91
65.83	31.80	-42.647	7.24
147.98	18.22	39.503	-6.34
147.98	52.31	39.503	27.75
115.23	19.94	6.753	-4.62
11.22	3.87	-97.257	-20.689

$\bar{x} = 108.477$ $\bar{y} = 24.56$

$(x_i - \bar{x})^2$	$(y_i - \bar{y})^2$
13090.334	0.0625
2488.712	10.24
2488.712	4.2025
0	26.522
1560.487	0.828
1818.767	52.417
1560.487	40.196
1560.487	770.062
45.603	21.344
9458.924	428.07
$\Sigma(x_i - \bar{x})^2 =$	$\Sigma(y_i - \bar{y})^2$
34072.514	$= 1353.95$

$$r = \frac{\Sigma (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\Sigma (x_i - \bar{x})^2 \Sigma (y_i - \bar{y})^2}}$$

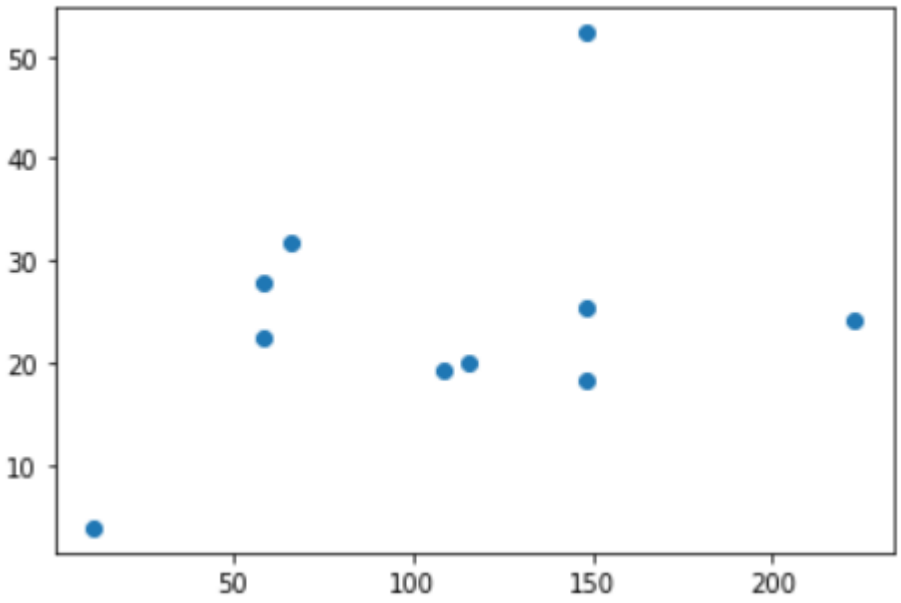
$$= \frac{2468.002}{\sqrt{34072 \times 13,53.95}}$$

$$= \frac{2468.002}{\sqrt{46132542.75}}$$

$$= \frac{2468.002}{6792.094}$$

$$\boxed{r = 0.3634}$$

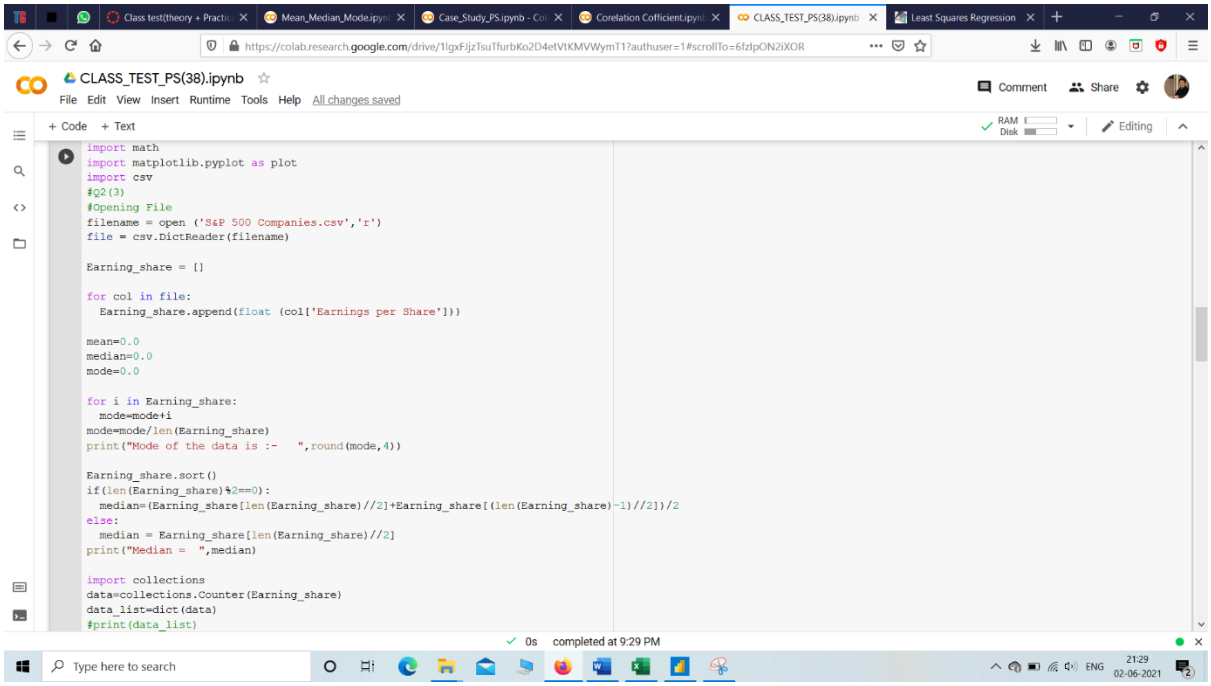
∴ Co-relation coefficient of the given data is found out to be 0.3634




```
108.47700000000002 24.56
Xi-xbar =   [114.41299999999997, -49.887000000000015, -49.887000000000
Yi-Ybar =   [-0.25, 3.200000000000003, -2.049999999999997, -5.14999999
2468.0023999999994
Xi-Xbar sq =   [13090.334568999993, 2488.7127690000016, 2488.712769000
yi-ybar sq =   [0.0625, 10.240000000000018, 4.202499999999988, 26.5224
Denominator  34072.514809999986 1353.9518
46132542.757526144
Denominator after sqrt  =  6792.094136385784
Corelation coefficient :-   0.3633639861937007
```

To verify the result code is performed in python to obtain correlation coefficient and same result was obtained.

3)



CLASS_TEST_PS(38).ipynb

File Edit View Insert Runtime Tools Help All changes saved

Comment Share

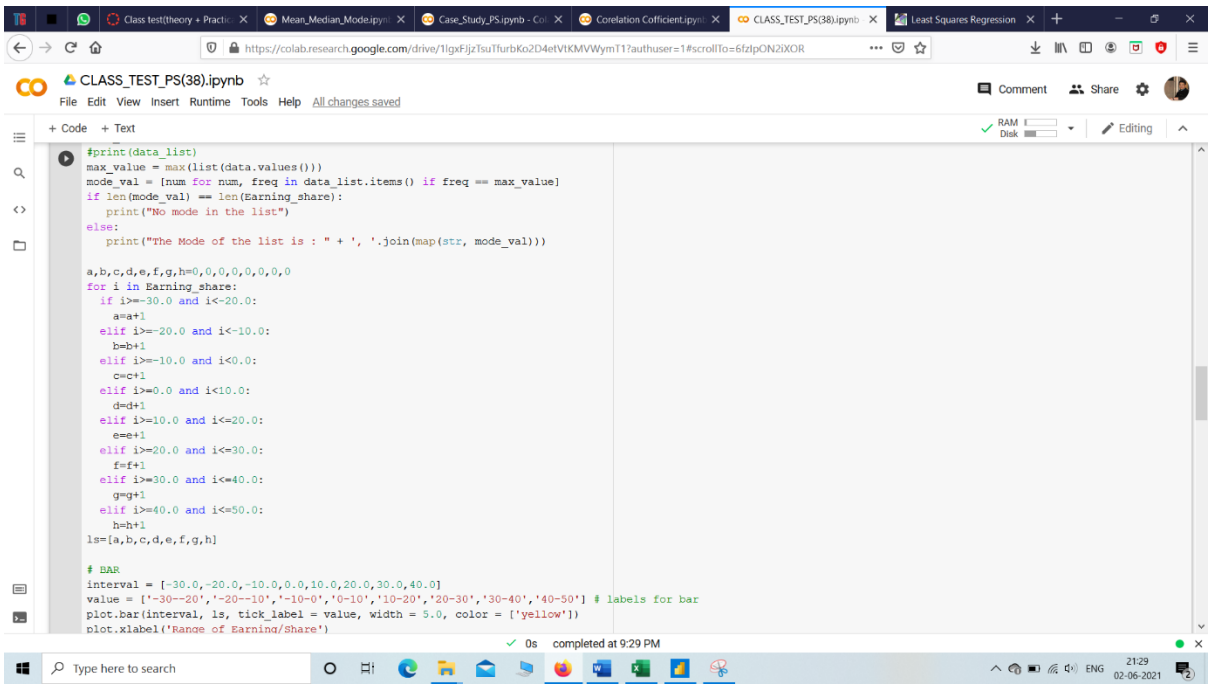
+ Code + Text

RAM Disk Editing

```
import math
import matplotlib.pyplot as plot
import csv
#Q2(3)
#Opening File
filename = open ('S&P 500 Companies.csv','r')
file = csv.DictReader(filename)

Earning_share = []

for col in file:
  Earning_share.append(float (col['Earnings per Share']))

mean=0.0
median=0.0
mode=0.0

for i in Earning_share:
  mode=mode+i
mode=mode/len(Earning_share)
print("Mode of the data is :-   ",round(mode,4))

Earning_share.sort()
if(len(Earning_share)%2==0):
  median=(Earning_share[len(Earning_share)//2]+Earning_share[(len(Earning_share)-1)//2])/2
else:
  median = Earning_share[len(Earning_share)//2]
print("Median =  ",median)

import collections
data=collections.Counter(Earning_share)
data_list=dict(data)
#print(data_list)
```

0s completed at 9:29 PM

Type here to search ENG 21:29 02-06-2021



CLASS_TEST_PS(38).ipynb

File Edit View Insert Runtime Tools Help All changes saved

Comment Share

+ Code + Text

RAM Disk Editing

```
#print(data_list)
max_value = max(list(data.values()))
mode_val = [num for num, freq in data_list.items() if freq == max_value]
if len(mode_val) == len(Earning_share):
   print("No mode in the list")
else:
   print("The Mode of the list is : " + ', '.join(map(str, mode_val)))

a,b,c,d,e,f,g,h=0,0,0,0,0,0,0,0
for i in Earning_share:
  if i>=-30.0 and i<-20.0:
    a=a+1
  elif i>=-20.0 and i<-10.0:
    b=b+1
  elif i>=-10.0 and i<0.0:
    c=c+1
  elif i>=0.0 and i<10.0:
    d=d+1
  elif i>=10.0 and i<=20.0:
    e=e+1
  elif i>=20.0 and i<=30.0:
    f=f+1
  elif i>=30.0 and i<=40.0:
    g=g+1
  elif i>=40.0 and i<=50.0:
    h=h+1
ls=[a,b,c,d,e,f,g,h]

# BAR
interval = [-30.0,-20.0,-10.0,0.0,10.0,20.0,30.0,40.0]
value = ['-30--20','-20--10','-10-0','0-10','10-20','20-30','30-40','40-50'] # labels for bar
plot.bar(interval, ls, tick_label = value, width = 5.0, color = ['yellow'])
plot.xlabel('Range of Earning/Share')
```

0s completed at 9:29 PM

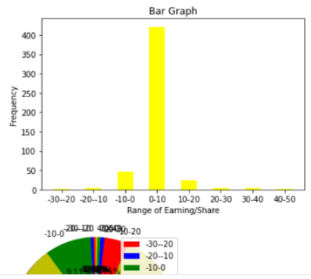
Type here to search ENG 21:29 02-06-2021

```
ls=[a,b,c,d,e,f,g,h]

# BAR
interval = [-30.0,-20.0,-10.0,0.0,10.0,20.0,30.0,40.0]
value = ['-30--20','-20--10','-10-0','0-10','10-20','20-30','30-40','40-50'] # labels for bar
plot.bar(interval, ls, tick_label = value, width = 5.0, color = ['yellow'])
plot.xlabel('Range of Earning/Share')
plot.ylabel('Frequency')
plot.title('Bar Graph')
plot.show()



# PIE
section = ['-30--20','-20--10','-10-0','0-10','10-20','20-30','30-40','40-50'] #  labels
colors = ['r', 'b', 'g', 'y','r', 'b', 'g', 'y']
plot.pie(ls, labels = section, colors=colors,startangle=90, shadow = True,radius = 1.2, autopct = '%1.2f%%')
plot.legend()
plot.show()


# OGIEVE
interval = [-20.0,-10.0,0.0,10.0,20.0,30.0,40.0,50.0]
sum=0
for i in ls:
  sum=sum+i
ls[0]=ls[0]/sum
for i in range(1,len(ls)):
  ls[i]=ls[i-1]+(ls[i]/sum)
plot.plot(interval, ls)
plot.xlabel('Earning/Share')
plot.ylabel('Cumulative frequency')
plot.title('Ogieve plot')
```

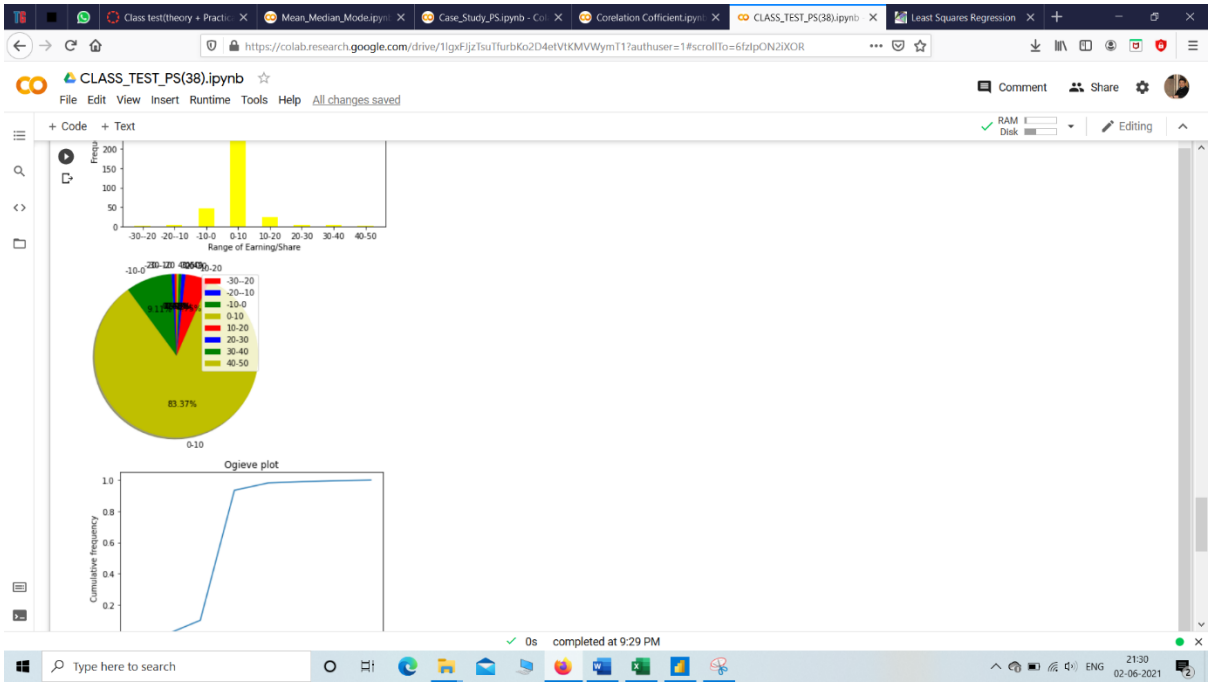
0s completed at 9:29 PM

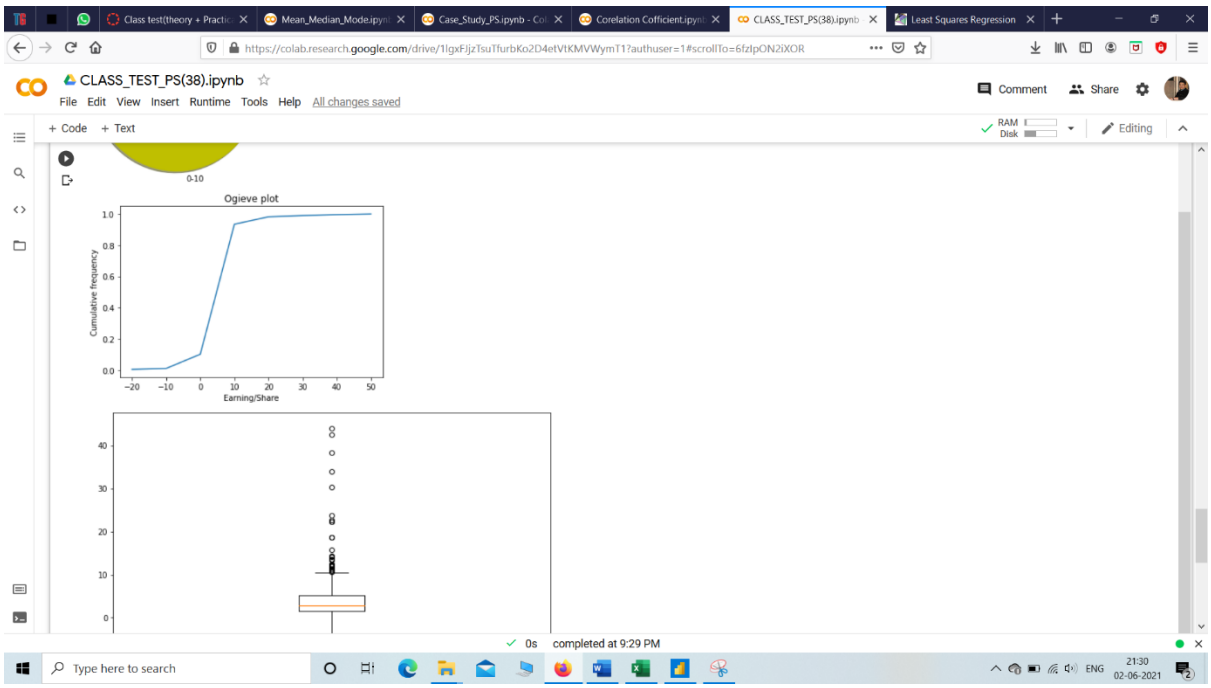
```
plot.title('Ogieve plot')
plot.show()


# BOX
import numpy as np
fig = plot.figure(figsize =(10, 8))
data=np.array(Earning_share)
plot.boxplot(data)
plot.show()
```

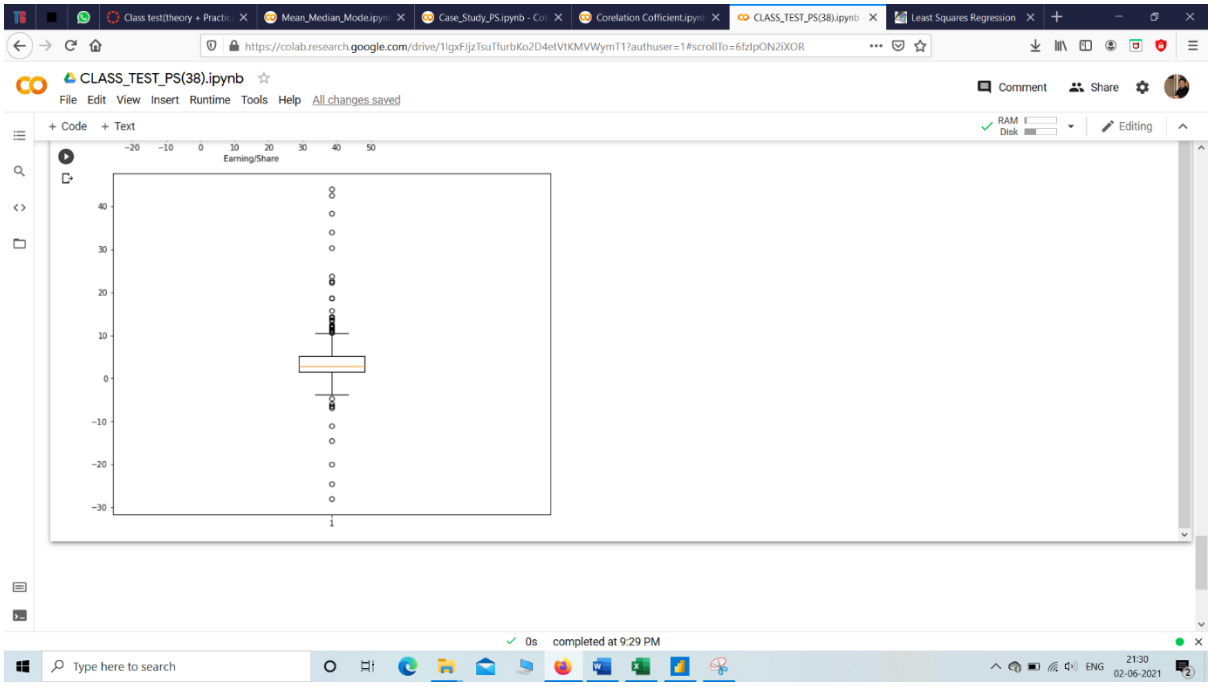
```
Mode of the data is :-    3.7537
Median =   2.89
The Mode of the list is : 1.0
```



0s completed at 9:29 PM


CLASS_TEST_PS(38).ipynb
File Edit View Insert Runtime Tools Help All changes saved
Comment
Share
+ Code + Text
RAM
Disk
Editing
Range of Earning/Share
-30--20
-20--10
-10-0
0-10
10-20
20-30
30-40
40-50
83.37%
0-10
Ogieve plot
Cumulative frequency
0s completed at 9:29 PM
Type here to search
ENG
21:30
02-06-2021


CLASS_TEST_PS(38).ipynb
File Edit View Insert Runtime Tools Help All changes saved
Comment
Share
+ Code + Text
RAM
Disk
Editing
0-10
Ogieve plot
Cumulative frequency
Earning/Share
0s completed at 9:29 PM
Type here to search
ENG
21:30
02-06-2021



All the codes are performed in python and working for all charts.

4)

DATE: / /

4) Binomial Distribution:-

The probability that a company in Healthcare sector gives overall Earning/Share in between $40-50. is 45%

Find that out of 65 companies selected at random from healthcare sector 35 companies would give overall Earning/Share between $40-50

$n = 65$ $\quad p = 45\% = 0.45$

$x = 35$ $\quad q = 55\% = 0.55$

$$P(x) = {}^{n}C_{x} (p)^{x} (q)^{n-x}$$

$$= {}^{65}C_{35} (0.45)^{35} (0.55)^{30}$$

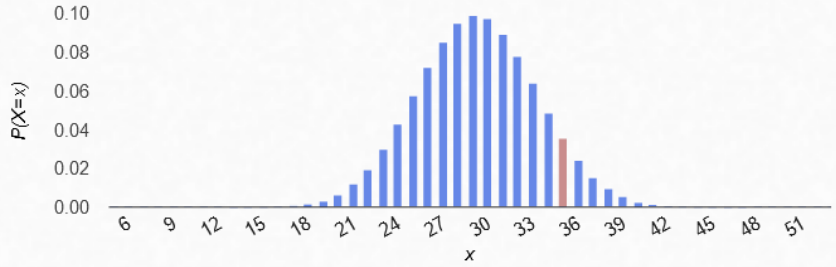
$$= \boxed{0.03563}$$

Binomial Distribution

$$X \sim Bin(n, p)$$

$n =$ 65 $p =$ .45

$x =$ 35 P(X = x) = 0.03563



$\mu = E(X) = 29.25$ $\sigma = SD(X) = 4.011$ $\sigma^2 = Var(X) = 16.088$

Help

PAGE
DATE: / /

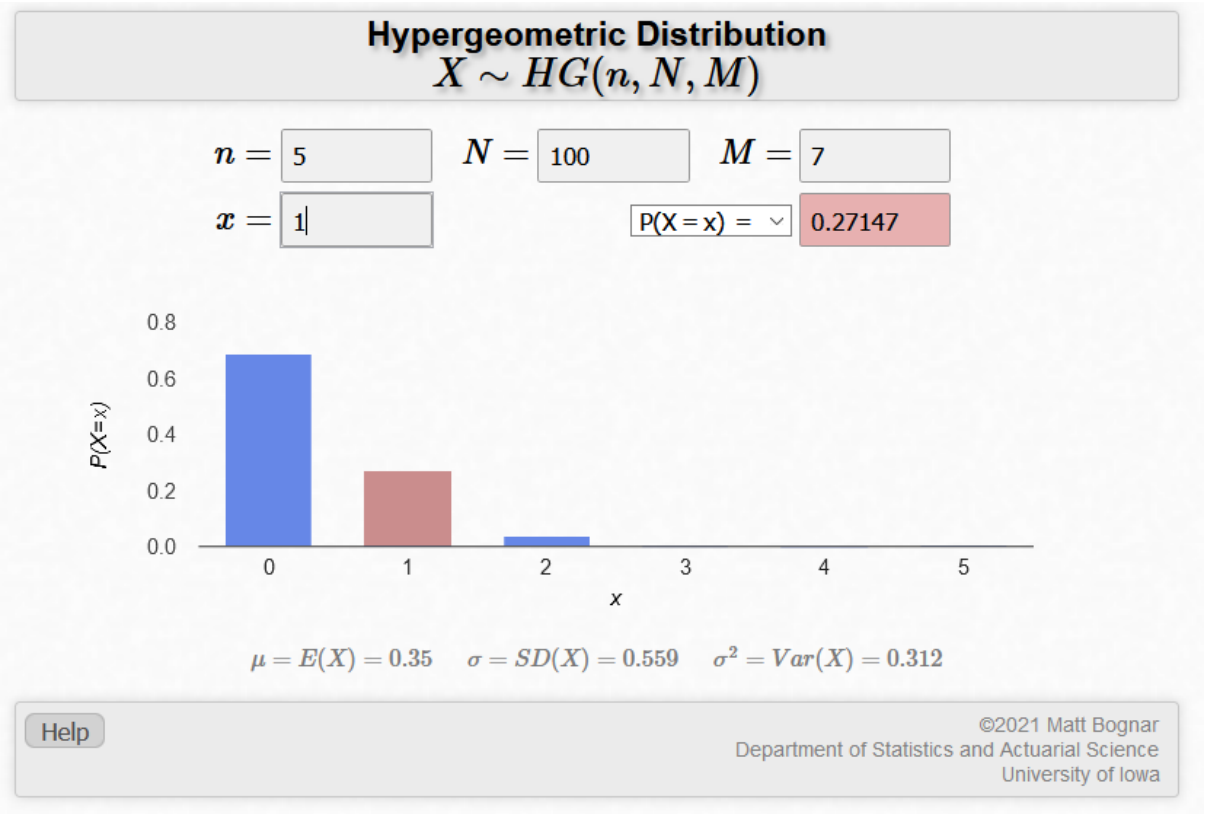
- Hypergeometric Distribution

It is known that out of 100 IT companies 7 companies will give us negative income (Loss) ∴ Negative earning/share

find the probability that if I buy shares of 5 different IT companies & I will make some profit in 4 of them and will get loss in one of them

$$P(x) = \frac{{}^{7}C_1 \times {}^{93}C_4}{{}^{100}C_5}$$

$$\boxed{P(x) = 0.2714}$$


Hypergeometric Distribution
$X \sim HG(n, N, M)$
$n =$ 5
$N =$ 100
$M =$ 7
$x =$ 1
P(X = x) =
0.27147
0.8
0.6
0.4
0.2
0.0
P(X=x)
0
1
2
3
4
5
x
$\mu = E(X) = 0.35$
$\sigma = SD(X) = 0.559$
$\sigma^2 = Var(X) = 0.312$
Help
©2021 Matt Bognar
Department of Statistics and Actuarial Science
University of Iowa

5)

5] NASDAQ has total 505 companies from differe sectors listed. We select 10 companies at random. Sample mean of the selected companies is 1084.7 and standard deviation is found to be 58.37.

Test null hypothesis $\mu_0 = 103.77$
against alternative hypothesis $\mu_0 < \mu$
significance level = 0.05

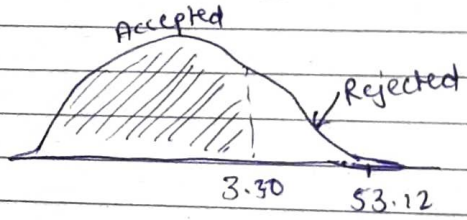
$$t = \frac{\bar{x} - \mu}{SE} = \frac{1084.7 - 103.77}{\frac{58.37}{\sqrt{10}}}$$

$$t = \frac{980.23}{18.45}$$

$$t = 53.12$$

From table $\Rightarrow$ $n - 1 = 9$
$\alpha = 0.05$

$= 3.250$



PAGE
DATE: / /

Here the computed value of $t = 53.12$ which is greater than 3.250 so null hypothesis is rejected and alternate hypothesis is accepted.

Hypothesis Testing Calculator

One Sample Test: Population Mean, σ is Unknown

Hypotheses:

$$H_0 : \mu = 103.77$$
$$H_a : \mu > 103.77$$

Rejection Region:

Reject H_0 if $T_{obs} > t_{0.05,\ 9.0} = 1.83311$

Test Statistic:

$$T_{obs} = 53.14328$$

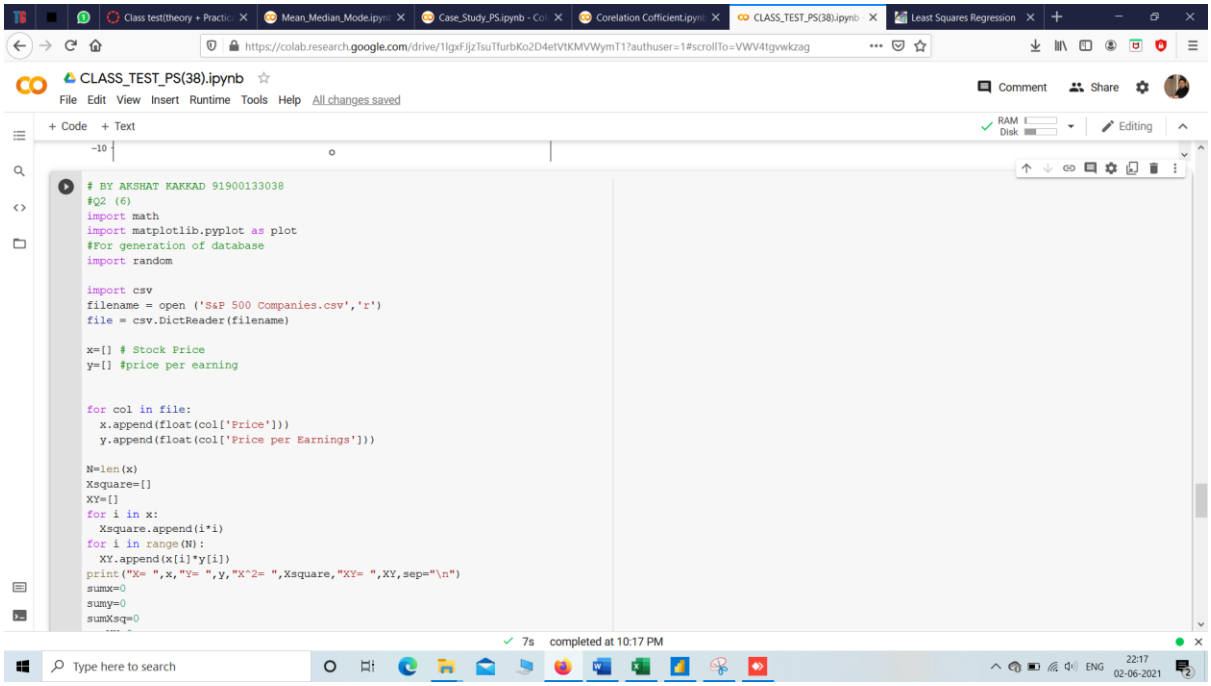
P-value:

$$p - value = P(T > T_{obs})$$
$$= P(T > 53.14328)$$
$$\therefore P(T > 53.14328) \ll P(T > 4.78091) = 5.0E-$$
$$\therefore p - value \ll 5.0E - 4$$

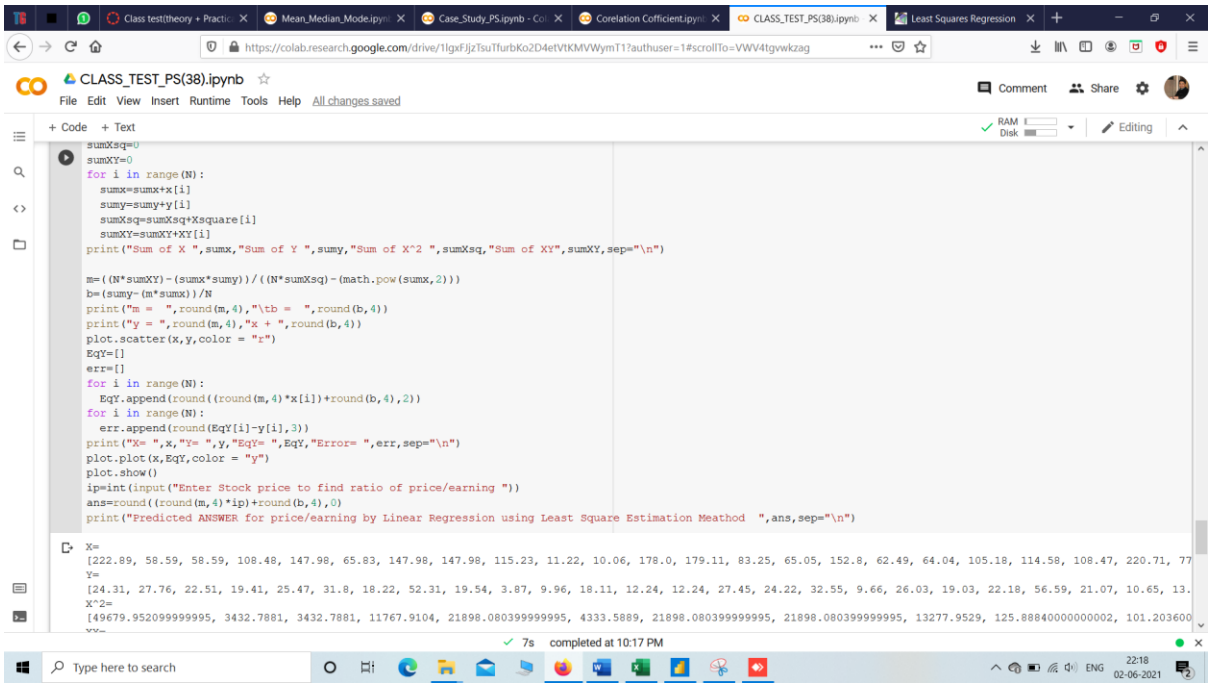
Conclusion:

Since $T_{obs} = 53.14328 > t_{0.05,\ 9.0} = 1.83311$ and the p-value $< \alpha = 0.05$ we reject H_0 and conclude that at the 5.0 % level of significance there is sufficient evidence to support a claim of a true mean greater than 103.77.

6)

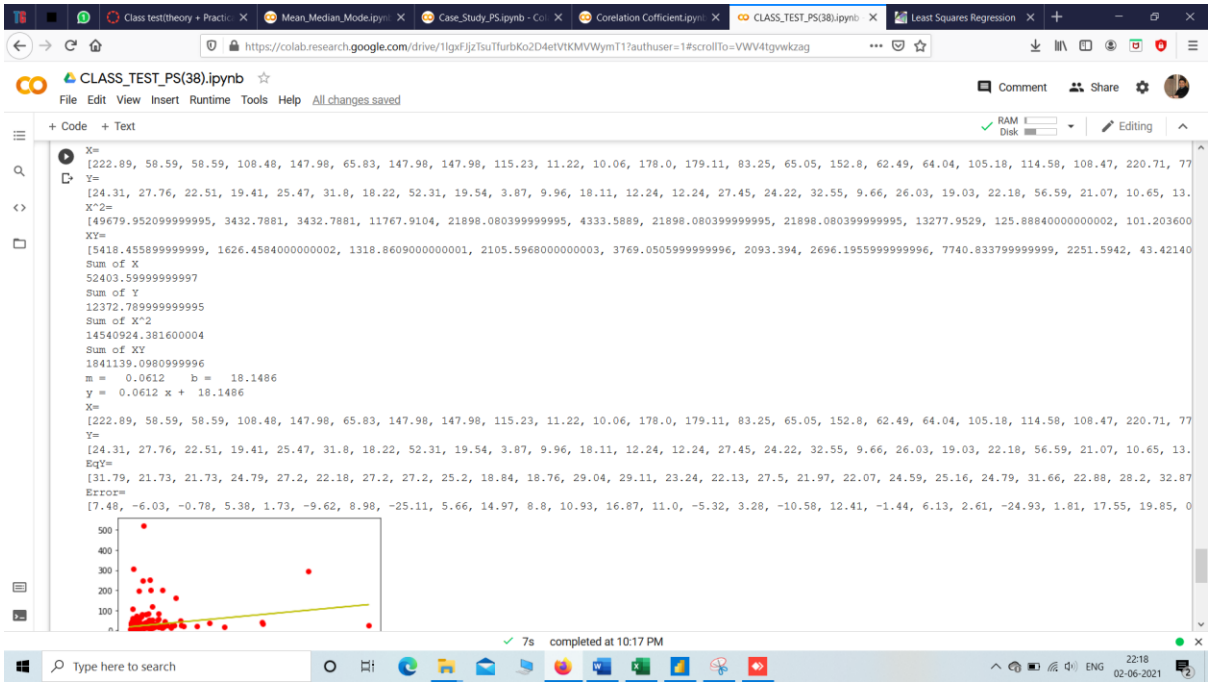


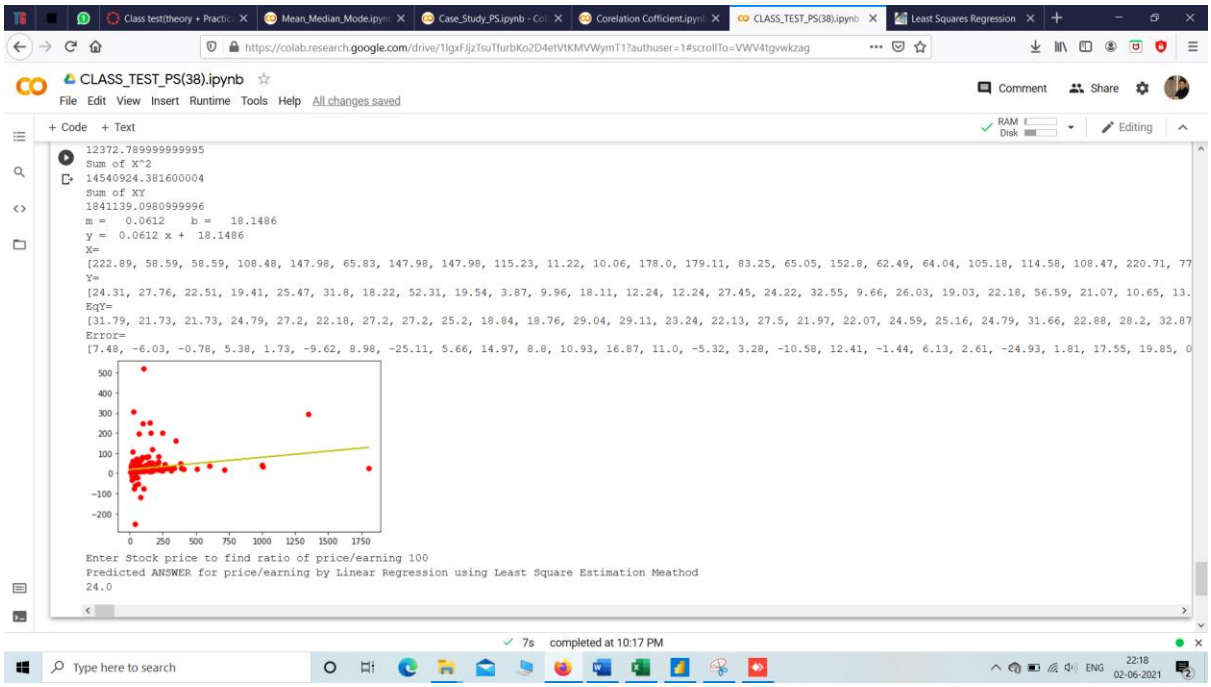
```
# BY AKSHAT KAKKAD 91900133038
#Q2 (6)
import math
import matplotlib.pyplot as plot
#For generation of database
import random

import csv
filename = open ('S&P 500 Companies.csv','r')
file = csv.DictReader(filename)

x=[] # Stock Price
y=[] #price per earning


for col in file:
  x.append(float(col['Price']))
  y.append(float(col['Price per Earnings']))

N=len(x)
Xsquare=[]
XY=[]
for i in x:
  Xsquare.append(i*i)
for i in range(N):
  XY.append(x[i]*y[i])
print("X= ",x,"Y= ",y,"X^2= ",Xsquare,"XY= ",XY,sep="\n")
sumx=0
sumy=0
sumXsq=0
```

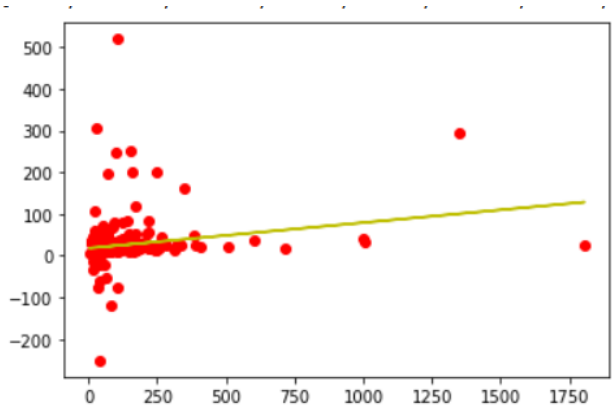


```
sumXsq=0
sumXY=0
for i in range(N):
  sumx=sumx+x[i]
  sumy=sumy+y[i]
  sumXsq=sumXsq+Xsquare[i]
  sumXY=sumXY+XY[i]
print("Sum of X ",sumx,"Sum of Y ",sumy,"Sum of X^2 ",sumXsq,"Sum of XY",sumXY,sep="\n")

m=((N*sumXY)-(sumx*sumy))/((N*sumXsq)-(math.pow(sumx,2)))
b=(sumy-(m*sumx))/N
print("m =  ",round(m,4),"\tb =  ",round(b,4))
print("y = ",round(m,4),"x + ",round(b,4))
plot.scatter(x,y,color = "r")
EqY=[]
err=[]
for i in range(N):
  EqY.append(round((round(m,4)*x[i])+round(b,4),2))
for i in range(N):
  err.append(round(EqY[i]-y[i],3))
print("X= ",x,"Y= ",y,"EqY= ",EqY,"Error= ",err,sep="\n")
plot.plot(x,EqY,color = "y")
plot.show()
ip=int(input("Enter Stock price to find ratio of price/earning "))
ans=round((round(m,4)*ip)+round(b,4),0)
print("Predicted ANSWER for price/earning by Linear Regression using Least Square Estimation Meathod  ",ans,sep="\n")
```

```
X=
[222.89, 58.59, 58.59, 108.48, 147.98, 65.83, 147.98, 147.98, 115.23, 11.22, 10.06, 178.0, 179.11, 83.25, 65.05, 152.8, 62.49, 64.04, 105.18, 114.58, 108.47, 220.71, 77
Y=
[24.31, 27.76, 22.51, 19.41, 25.47, 31.8, 18.22, 52.31, 19.54, 3.87, 9.96, 18.11, 12.24, 12.24, 27.45, 24.22, 32.55, 9.66, 26.03, 19.03, 22.18, 56.59, 21.07, 10.65, 13.
X^2=
[49679.952099999995, 3432.7881, 3432.7881, 11767.9104, 21898.080399999995, 4333.5889, 21898.080399999995, 21898.080399999995, 13277.9529, 125.88840000000002, 101.203600
```


CLASS_TEST_PS(38).ipynb
File Edit View Insert Runtime Tools Help All changes saved
Comment
Share
+ Code + Text
RAM
Disk
Editing
X=
[222.89, 58.59, 58.59, 108.48, 147.98, 65.83, 147.98, 147.98, 115.23, 11.22, 10.06, 178.0, 179.11, 83.25, 65.05, 152.8, 62.49, 64.04, 105.18, 114.58, 108.47, 220.71, 77
Y=
[24.31, 27.76, 22.51, 19.41, 25.47, 31.8, 18.22, 52.31, 19.54, 3.87, 9.96, 18.11, 12.24, 12.24, 27.45, 24.22, 32.55, 9.66, 26.03, 19.03, 22.18, 56.59, 21.07, 10.65, 13.
X^2=
[49679.952099999995, 3432.7881, 3432.7881, 11767.9104, 21898.080399999995, 4333.5889, 21898.080399999995, 21898.080399999995, 13277.9529, 125.88840000000002, 101.203600
XY=
[5418.455899999999, 1626.4584000000002, 1318.8609000000001, 2105.5968000000003, 3769.0505999999996, 2093.394, 2696.1955999999996, 7740.833799999999, 2251.5942, 43.42140
Sum of X
52403.59999999997
Sum of Y
12372.789999999995
Sum of X^2
14540924.381600004
Sum of XY
1841139.0980999996
m = 0.0612 b = 18.1486
y = 0.0612 x + 18.1486
X=
[222.89, 58.59, 58.59, 108.48, 147.98, 65.83, 147.98, 147.98, 115.23, 11.22, 10.06, 178.0, 179.11, 83.25, 65.05, 152.8, 62.49, 64.04, 105.18, 114.58, 108.47, 220.71, 77
Y=
[24.31, 27.76, 22.51, 19.41, 25.47, 31.8, 18.22, 52.31, 19.54, 3.87, 9.96, 18.11, 12.24, 12.24, 27.45, 24.22, 32.55, 9.66, 26.03, 19.03, 22.18, 56.59, 21.07, 10.65, 13.
EqY=
[31.79, 21.73, 21.73, 24.79, 27.2, 22.18, 27.2, 27.2, 25.2, 18.84, 18.76, 29.04, 29.11, 23.24, 22.13, 27.5, 21.97, 22.07, 24.59, 25.16, 24.79, 31.66, 22.88, 28.2, 32.87
Error=
[7.48, -6.03, -0.78, 5.38, 1.73, -9.62, 8.98, -25.11, 5.66, 14.97, 8.8, 10.93, 16.87, 11.0, -5.32, 3.28, -10.58, 12.41, -1.44, 6.13, 2.61, -24.93, 1.81, 17.55, 19.85, 0
500
400
300
200
100
7s completed at 10:17 PM
Type here to search
ENG
22:18
02-06-2021


CLASS_TEST_PS(38).ipynb
File Edit View Insert Runtime Tools Help All changes saved
Comment
Share
+ Code + Text
RAM
Disk
Editing
12372.789999999995
Sum of X^2
14540924.381600004
Sum of XY
1841139.0980999996
m = 0.0612 b = 18.1486
y = 0.0612 x + 18.1486
X=
[222.89, 58.59, 58.59, 108.48, 147.98, 65.83, 147.98, 147.98, 115.23, 11.22, 10.06, 178.0, 179.11, 83.25, 65.05, 152.8, 62.49, 64.04, 105.18, 114.58, 108.47, 220.71, 77
Y=
[24.31, 27.76, 22.51, 19.41, 25.47, 31.8, 18.22, 52.31, 19.54, 3.87, 9.96, 18.11, 12.24, 12.24, 27.45, 24.22, 32.55, 9.66, 26.03, 19.03, 22.18, 56.59, 21.07, 10.65, 13.
EqY=
[31.79, 21.73, 21.73, 24.79, 27.2, 22.18, 27.2, 27.2, 25.2, 18.84, 18.76, 29.04, 29.11, 23.24, 22.13, 27.5, 21.97, 22.07, 24.59, 25.16, 24.79, 31.66, 22.88, 28.2, 32.87
Error=
[7.48, -6.03, -0.78, 5.38, 1.73, -9.62, 8.98, -25.11, 5.66, 14.97, 8.8, 10.93, 16.87, 11.0, -5.32, 3.28, -10.58, 12.41, -1.44, 6.13, 2.61, -24.93, 1.81, 17.55, 19.85, 0
500
400
300
200
100
0
−100
−200
0
250
500
750
1000
1250
1500
1750
Enter Stock price to find ratio of price/earning 100
Predicted ANSWER for price/earning by Linear Regression using Least Square Estimation Meathod
24.0
7s completed at 10:17 PM
Type here to search
ENG
22:18
02-06-2021




```
Enter Stock price to find ratio of price/earning 100
Predicted ANSWER for price/earning by Linear Regression using Least Square Estimation Meathod
24.0
```

Theoretical Work For 10 sample data.

6)

Take two columns find co-relation coefficient based on it

Stock price	price / Earning
222.89	24.31
58.59	27.76
58.59	22.51
108.48	19.41
147.98	25.47
65.83	31.8
147.98	18.22
147.98	52.31
115.23	19.94
11.22	3.87

DATE: / /

X	Y	X^2	XY	Eq Y	Error
222.89	24.31	49679.95	5418.45	32.84	8.53
58.59	27.76	3432.79	1626.45	20.94	-6.82
58.59	22.51	3432.79	1318.86	20.94	-1.57
108.48	19.41	11767.91	2105.59	24.56	5.15
147.98	25.47	21898.08	3769.05	27.42	1.95
65.83	31.8	4333.58	2093.39	21.47	-10.33
147.98	18.22	21898.10	2696.20	27.42	9.2
147.98	52.31	21898.10	7740.83	~~25.05~~ 27.42	-24.89
115.23	19.94	13277.95	2297.68	25.05	5.11
11.22	3.87	125.89	43.421	17.51	13.64

$\Sigma X =$	$\Sigma Y =$	$\Sigma X^2 =$	$\Sigma XY =$
1084.7	245.6	151745.11	29109.95

$$m = \frac{N\Sigma(xy) - \Sigma x \Sigma y}{N\Sigma x^2 - (\Sigma x)^2}$$

$$m = \frac{(10 \times 29109.95) - (1084.77 \times 245.6)}{(10 \times 151745.11) - (1084.77)^2}$$

$$\boxed{m = 0.0724}$$

$$b = \frac{\Sigma y - m\Sigma x}{N}$$

$$= \frac{245.6 - 0.0724\,(1084.77)}{10}$$

$$\boxed{b = 16.702}$$

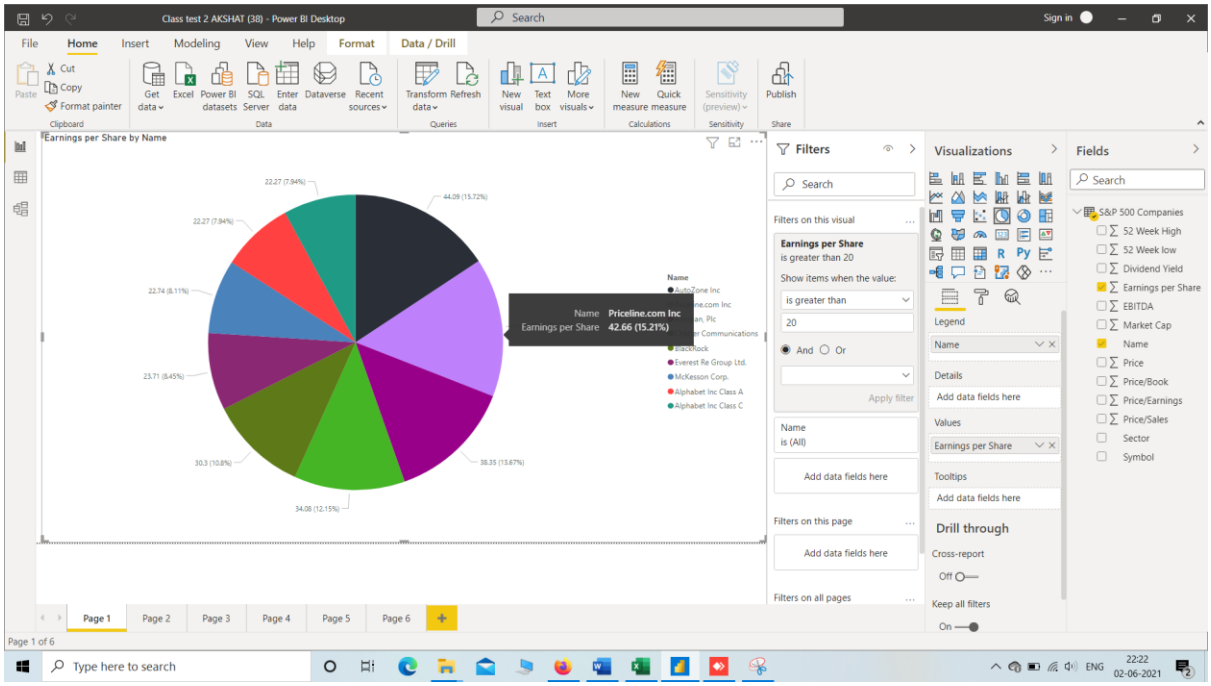
∴ Equation of Regression Line

$$y = mx + b$$

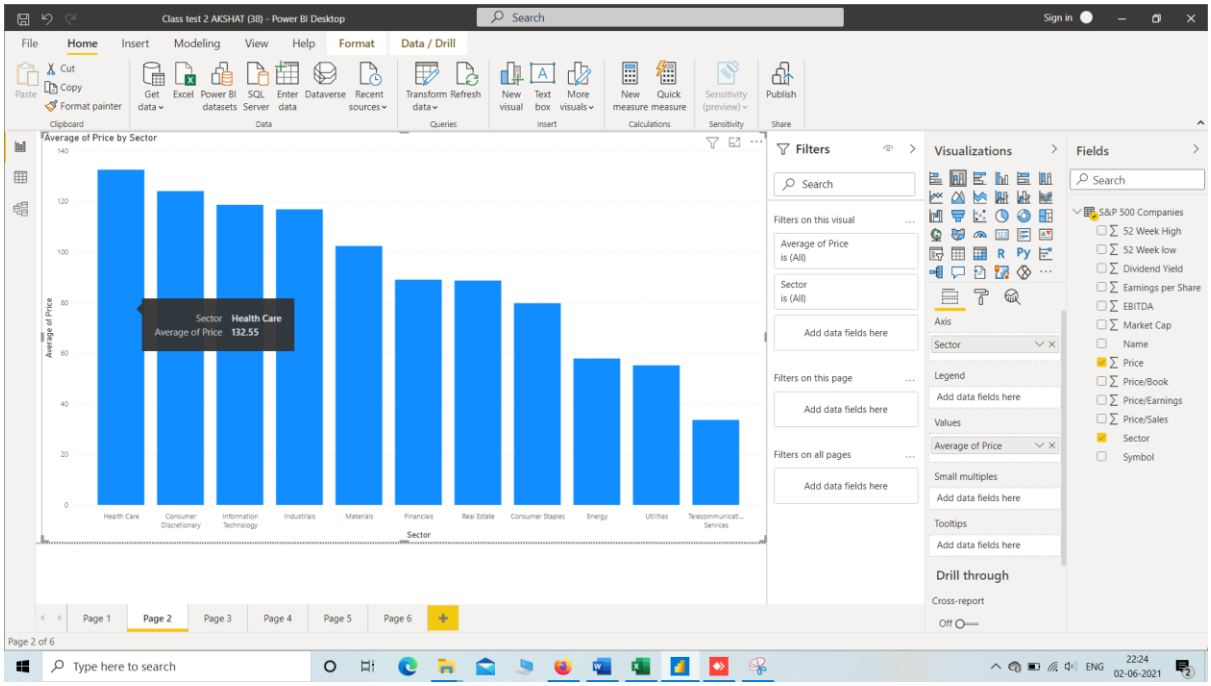
$$\boxed{y = 0.0724x + 16.702}$$

Now we can predict that the stock having price of 100 can give us a ratio of ~~2400~~ price/Earning as 24.0.

7)

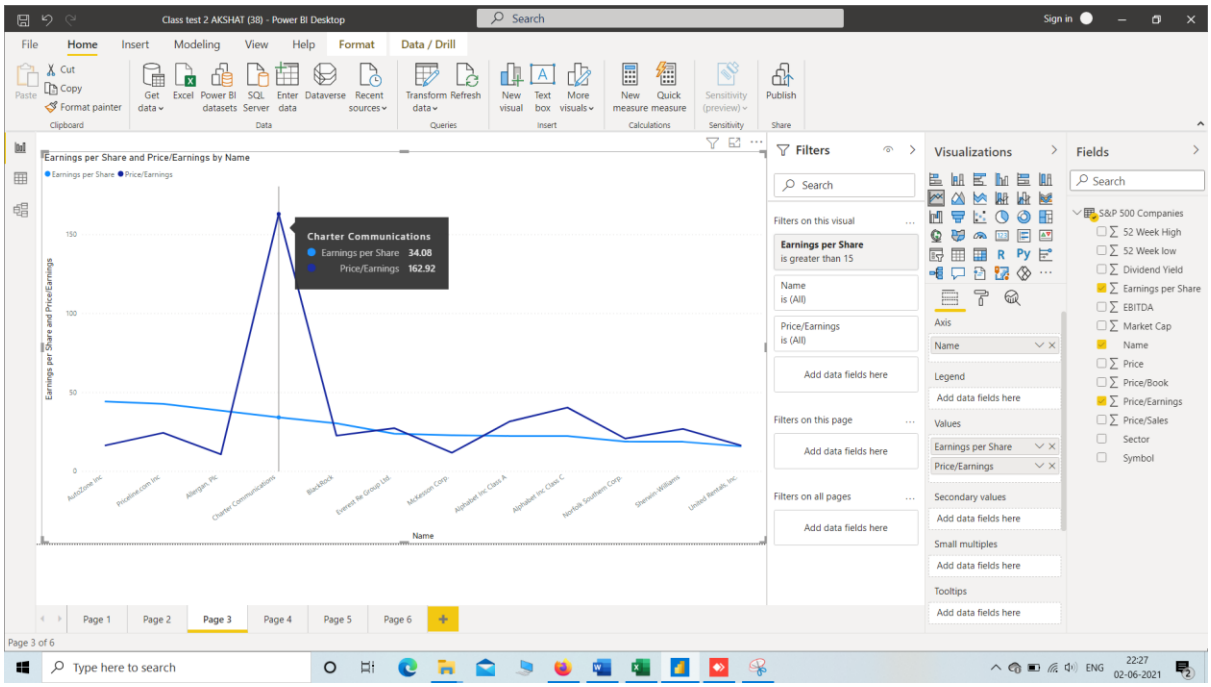


Here the filter applied is the shares giving annual return of more the $20.We find 9 such companies out of which **Priceline.com** Inc gives us highest Earnings per share = $42.66 (Best share).**PIE CHART**

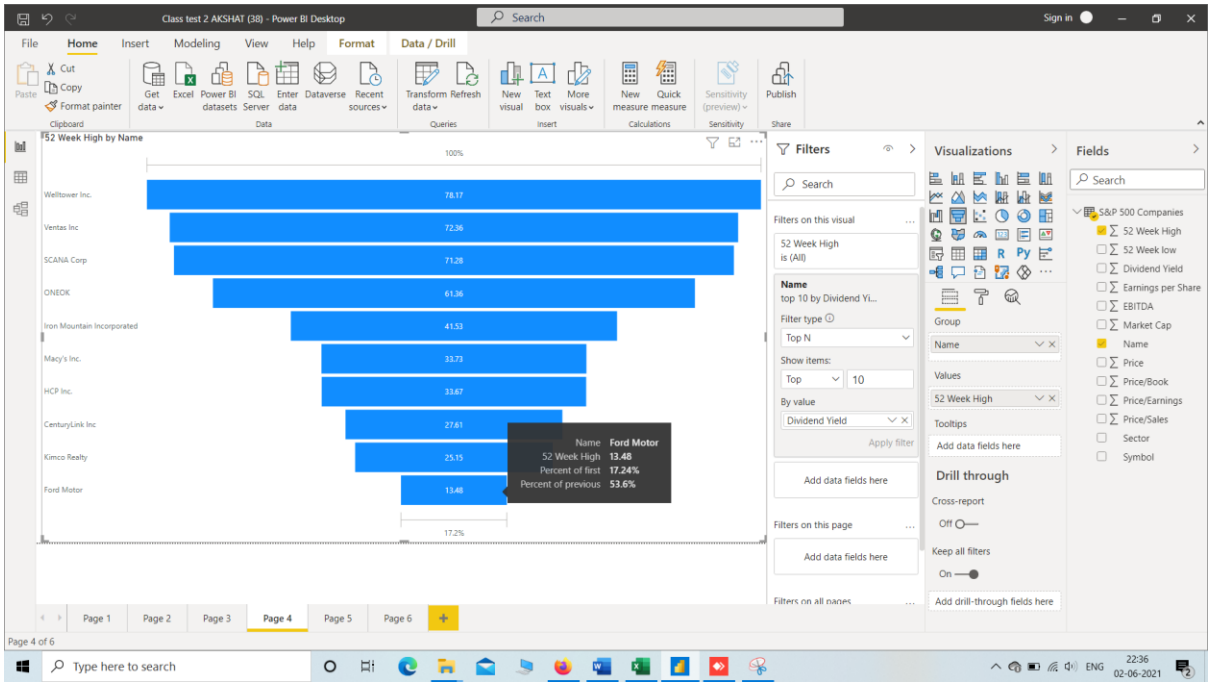


Here there is no filter applied and all the sectors are taken in consideration. We observe that **health care sector has the highest average price ratio** among all

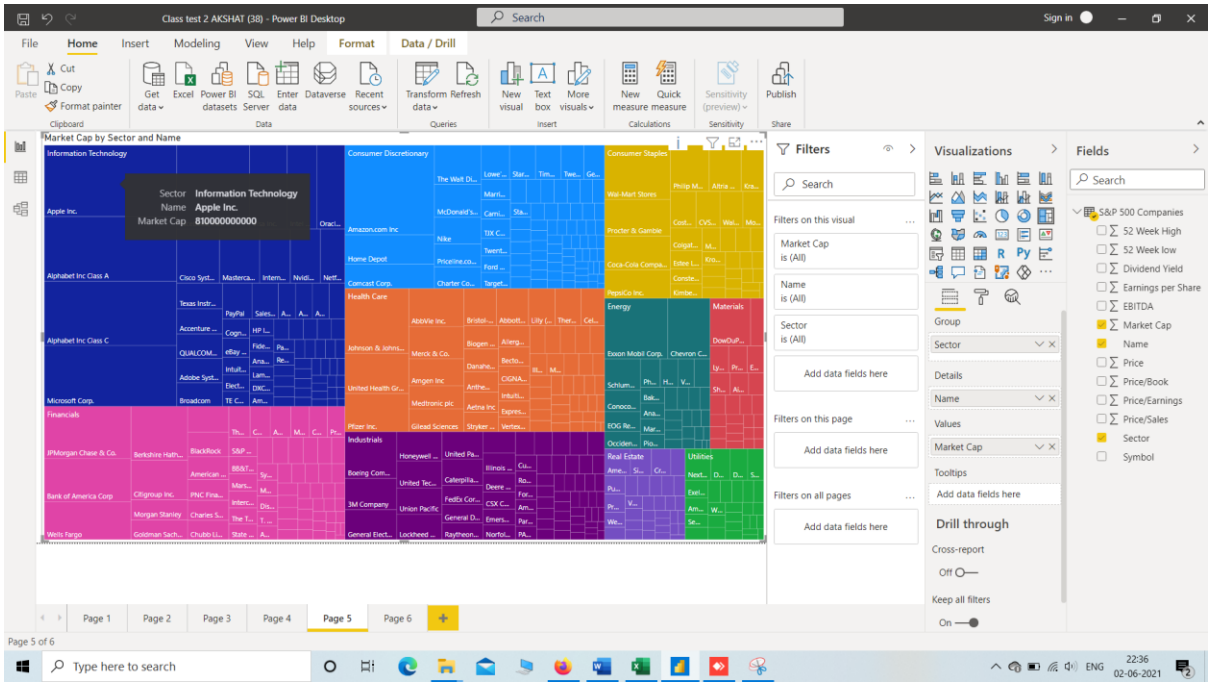
sectors in market. So, we can infer that **avg. price of any health care stock is costlier** as compared to any other stock of any other sector in the price band. **BAR PLOT.**



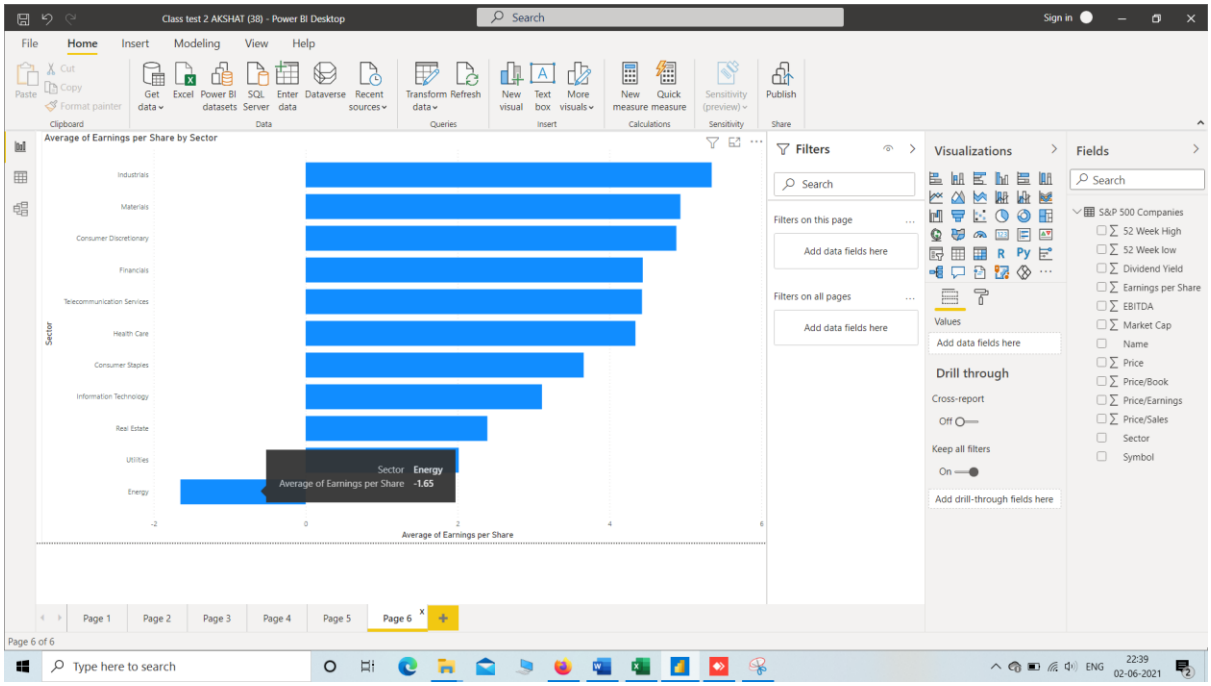
Here we analyze two parameters for stocks earning per share and price per earning which are having earning per share > $15(filter). We see that charter communications have a very good ratio of **price / earning (162.92)** and also has a good **earning per share ($34.08)** Which tells us that by investing it is a good share to buy but is having **very high** price, so we can **choose some other shares having low price/earning ratio to gain more benefit. LINE CHART.**



Here we filter out top 10 companies which gives **highest dividend** annually. We then analyze 52-week high for all these companies and find that **ford motor** having the 52-week high of **$13.48** but still it is **one of the highest 10** out of 505 companies to give dividend which makes the **share fundamentally strong. FUNNEL CHART.**



Here we analyze market cap by different sectors. It is found that **IT sector** occupies **highest market cap** and **Apple Inc**. has the largest contribution in it as it has market cap of **$810000000000**. **TREE MAP**



Here we analyze avg. earning per share by sector. It is found that all sectors except **energy** gives positive avg. earning per share. This infers that we should **avoid buying energy sector shares** to keep our money safe.

(avg earning/share = -1.65) . **STACKED BAR CHART.**

Google colab link for code performed in all the above questions.(Click here).