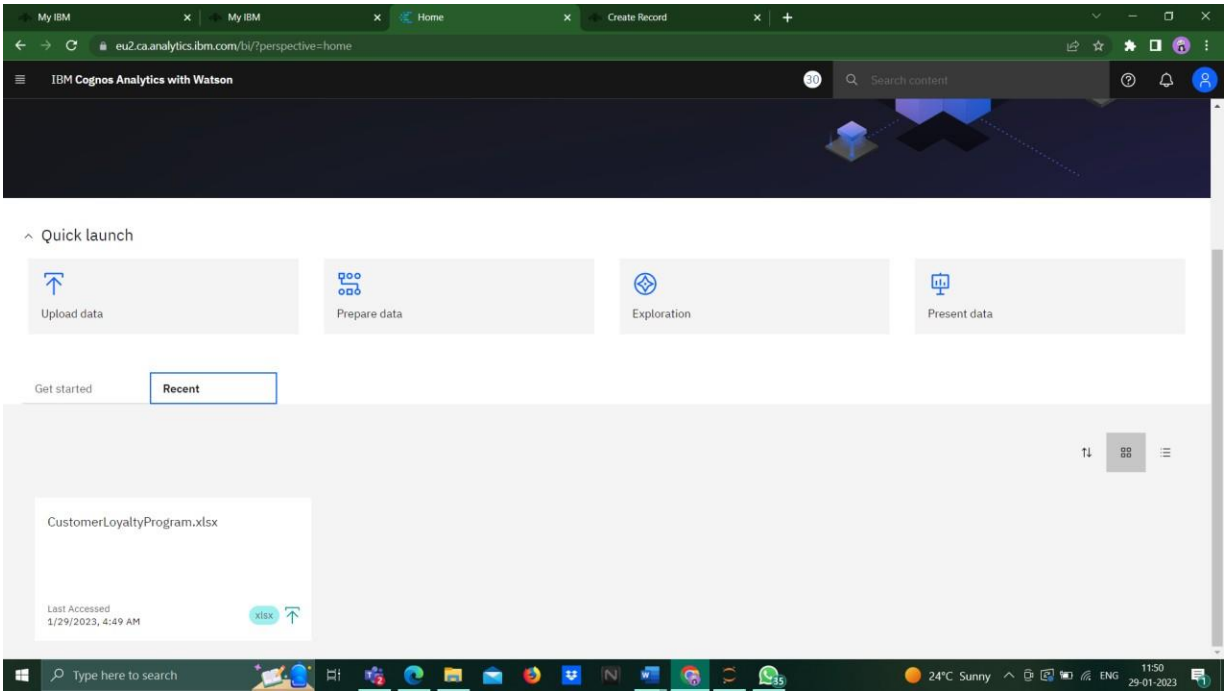
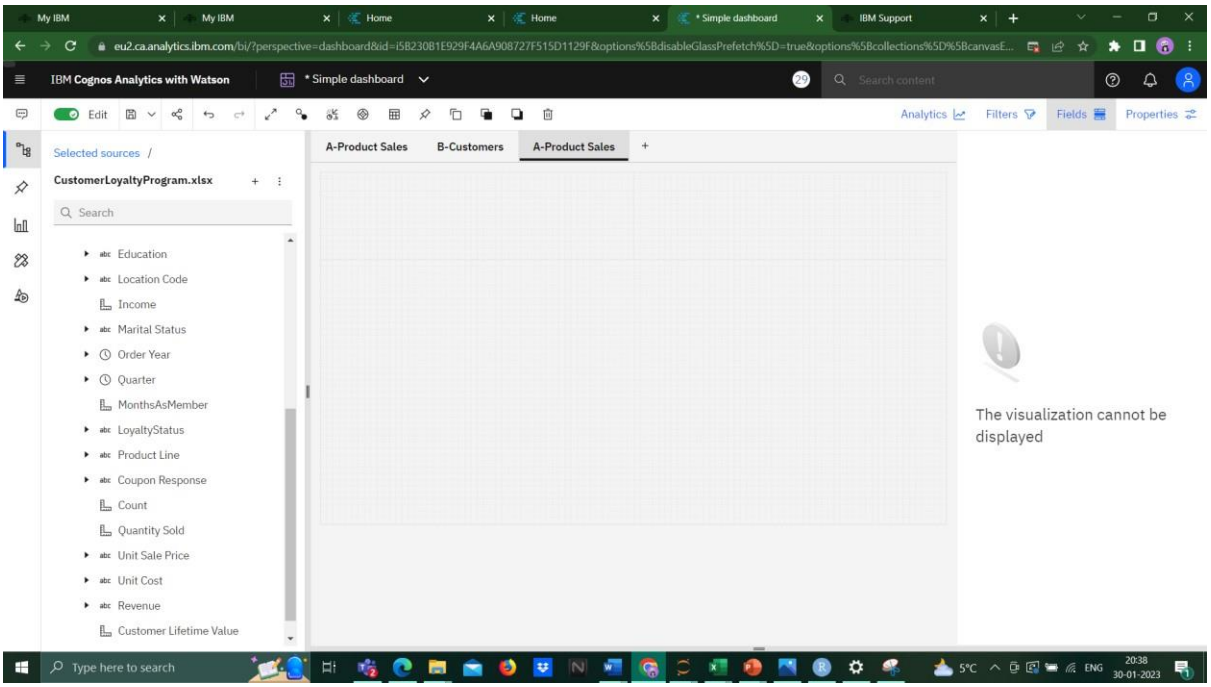
Analysis Using IBM Cognos

Once the Dataset is uploaded, we can start creating a dashboard**.**

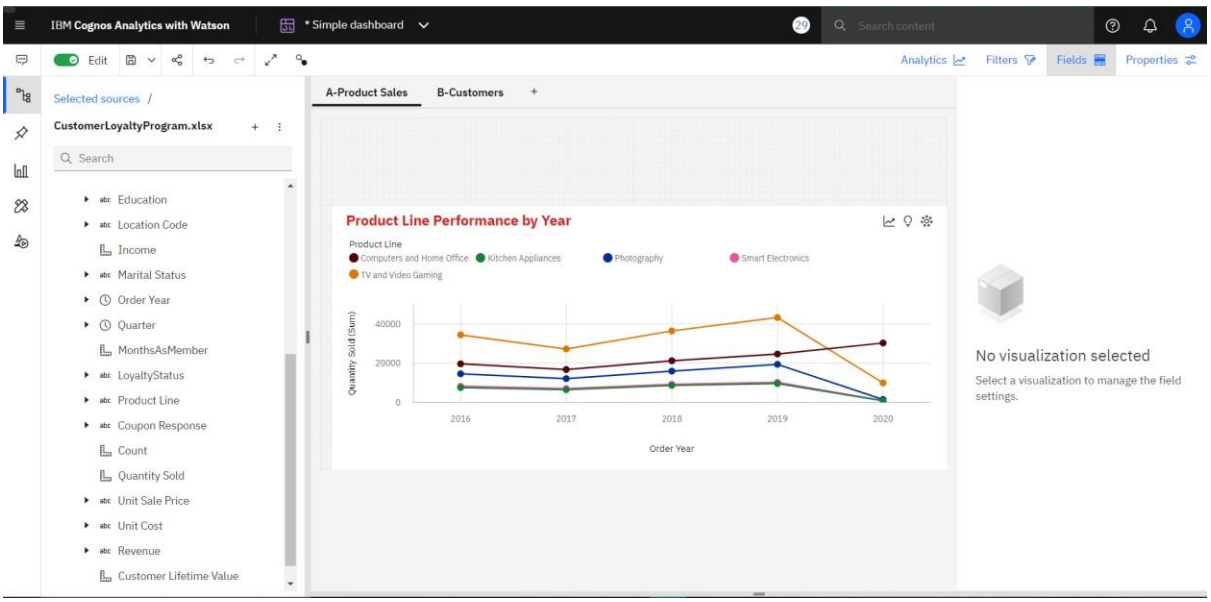


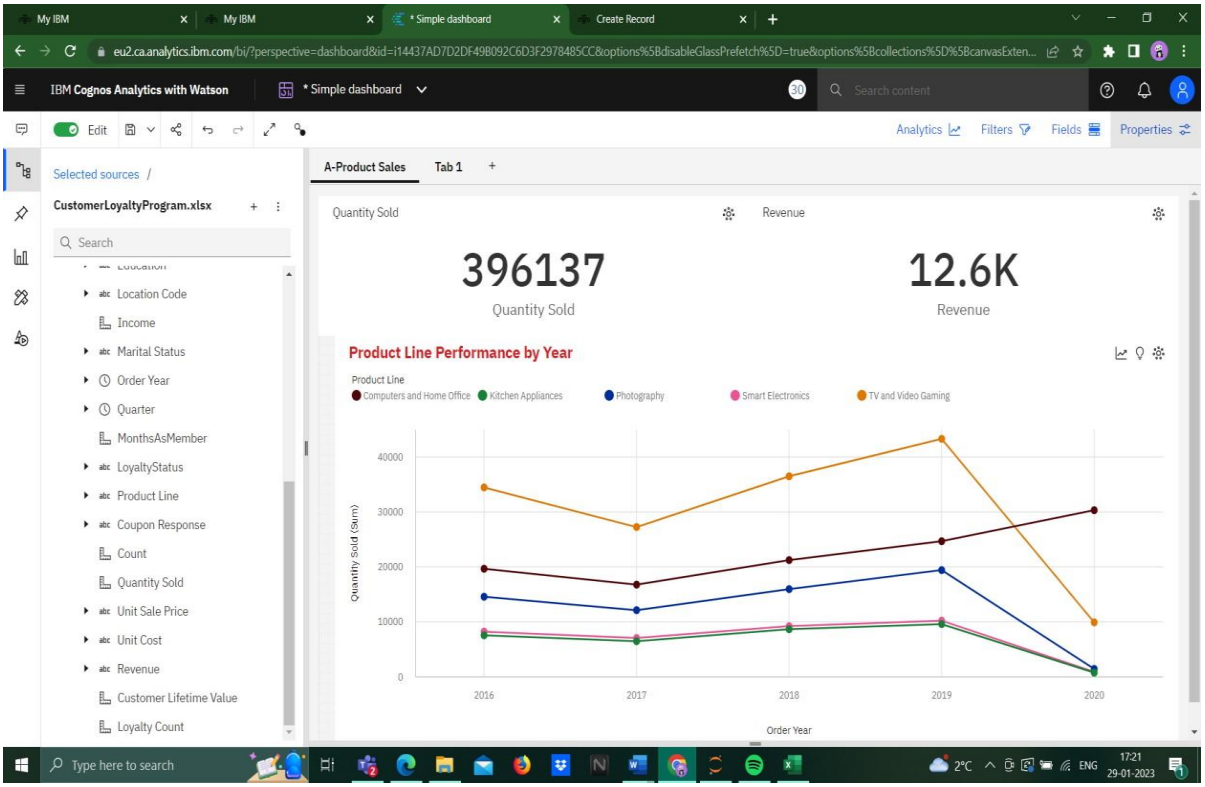
Dashboard A-Product Sales

The dashboard template must be chosen.

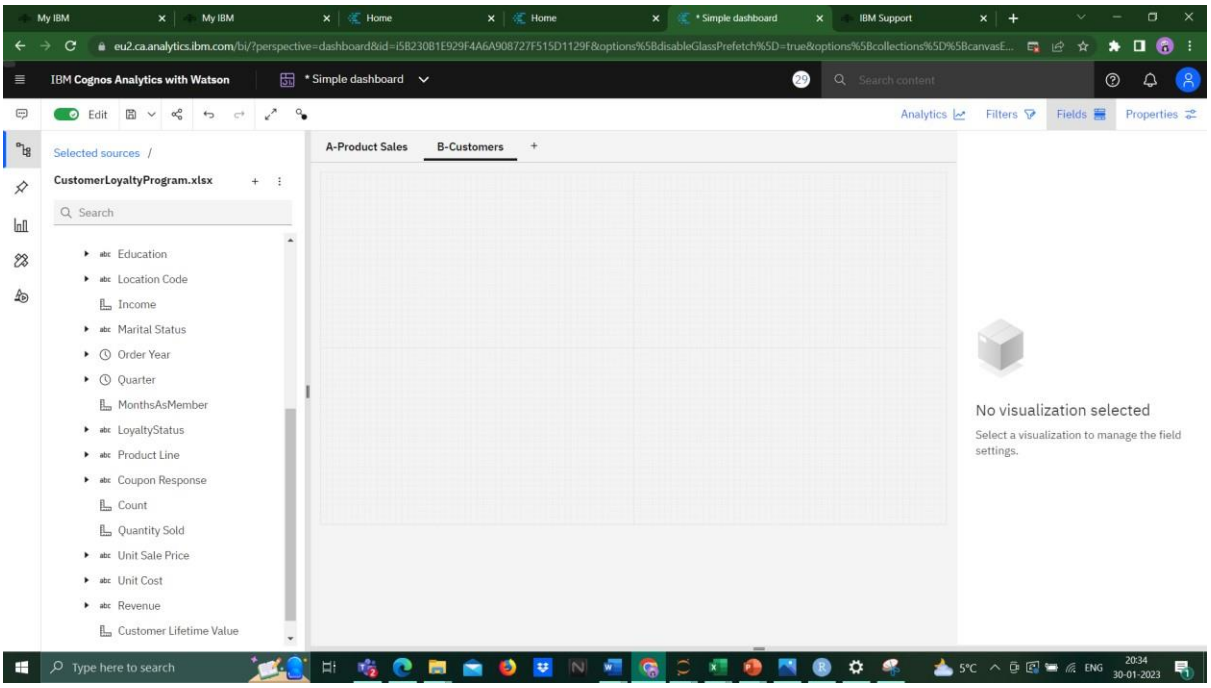


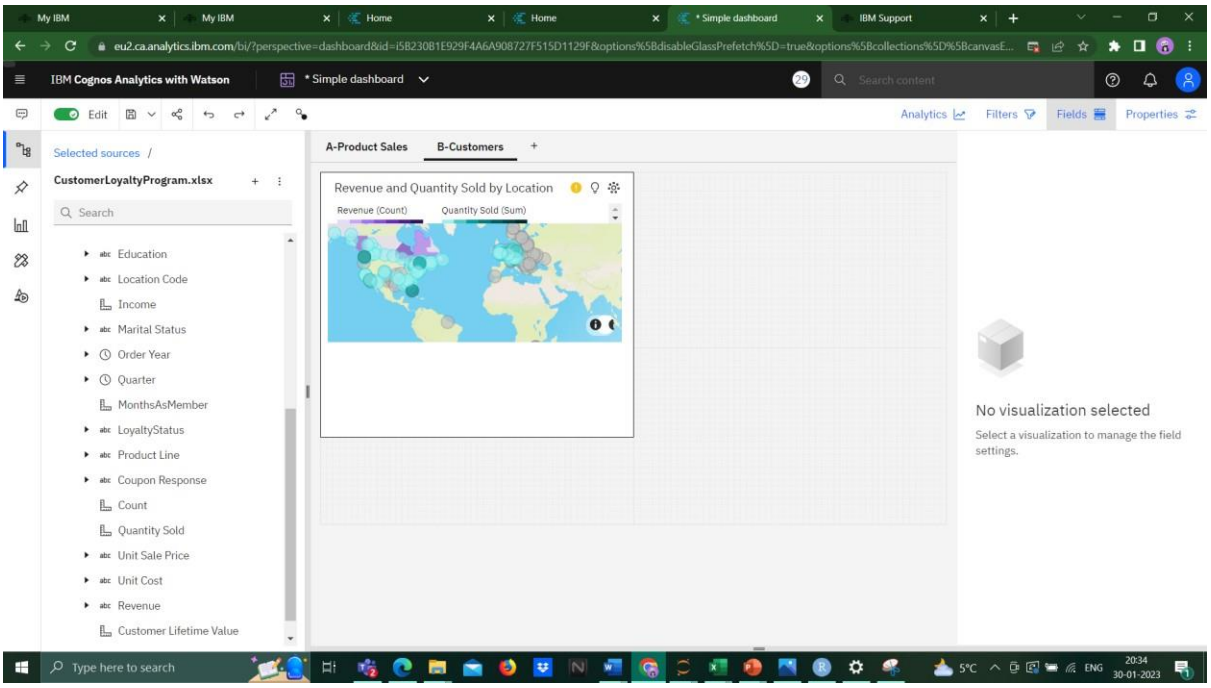
Visualization of data can be done by dragging the required fields into the panels of dashboard once it turns blue.

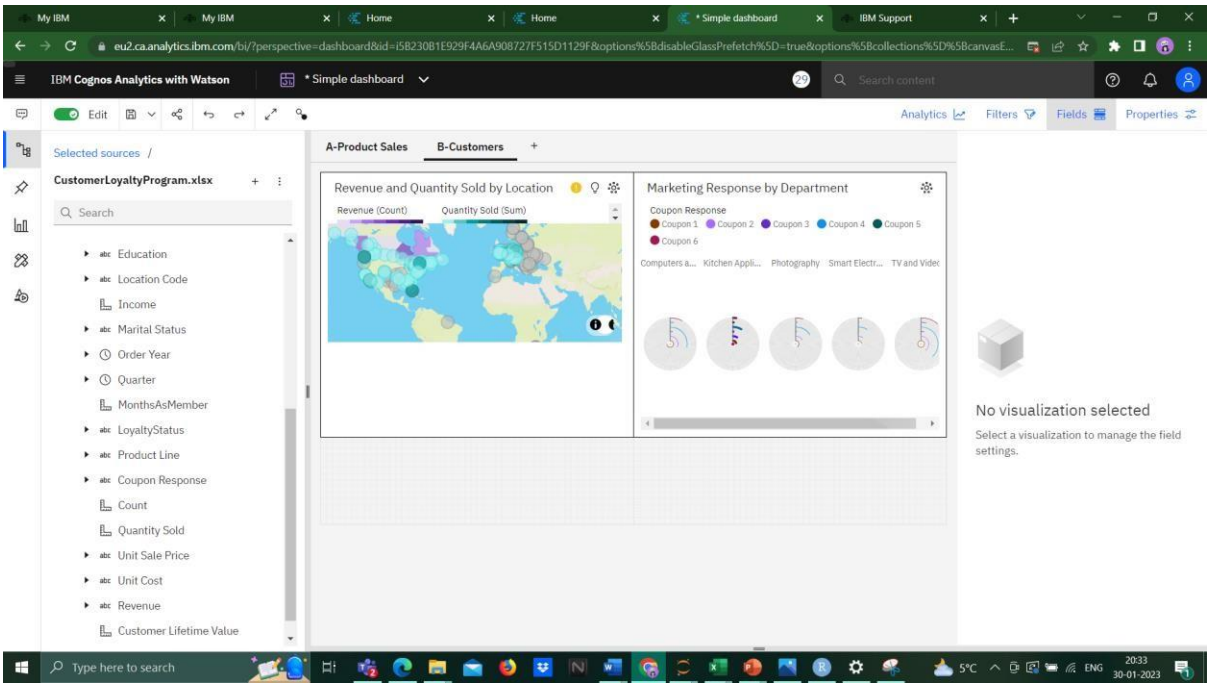


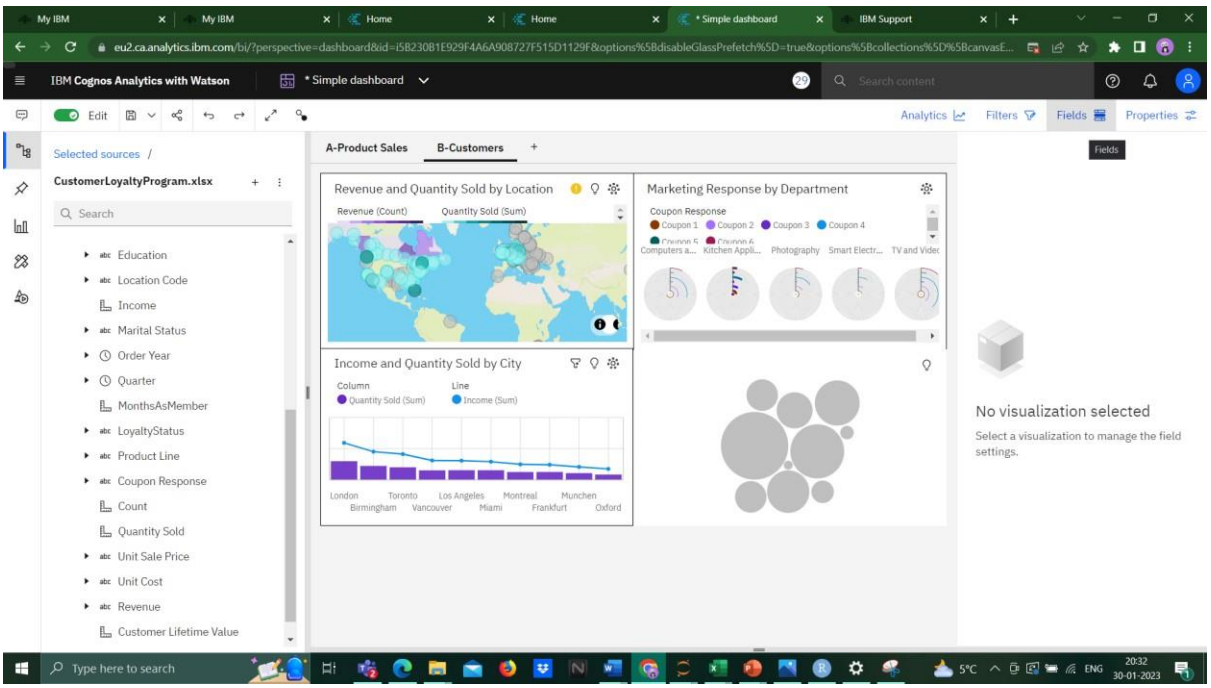


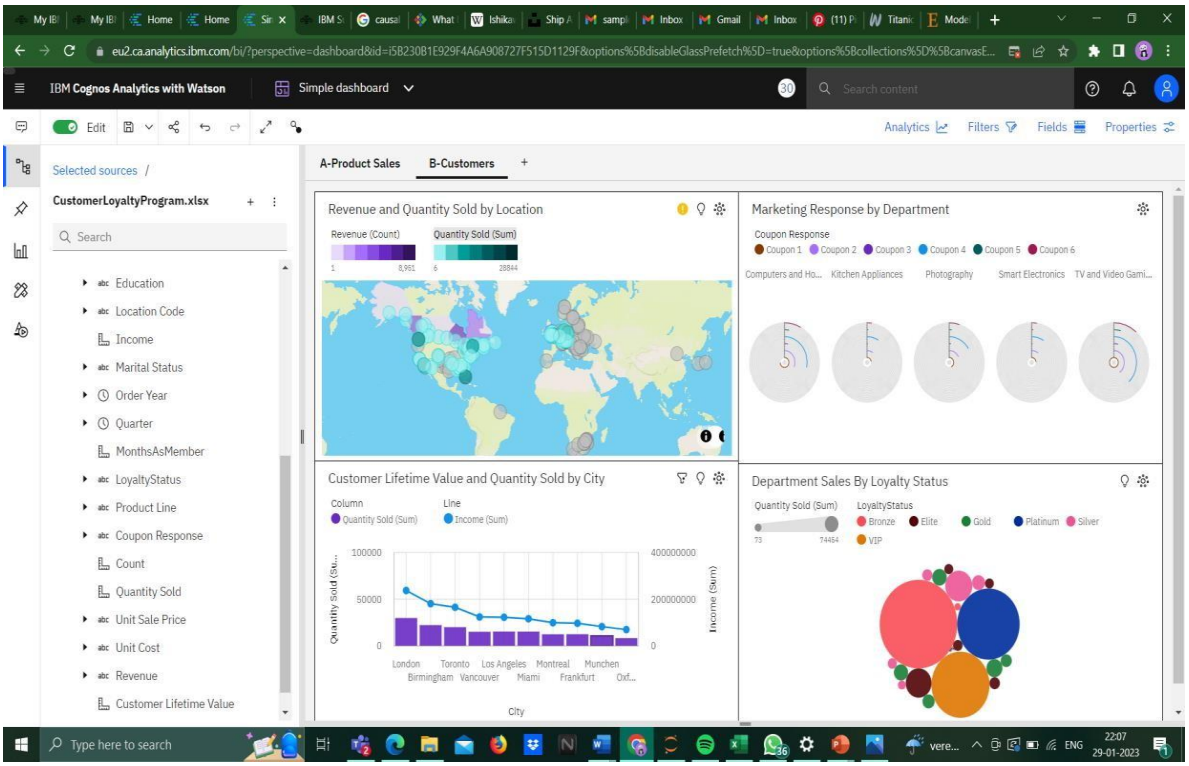
Dashboard B-Customers






IBM Cognos Analytics with Watson
* Simple dashboard
Edit
Analytics
Filters
Fields
Properties
Selected sources /
CustomerLoyaltyProgram.xlsx
Search
Education
Location Code
Income
Marital Status
Order Year
Quarter
MonthsAsMember
LoyaltyStatus
Product Line
Coupon Response
Count
Quantity Sold
Unit Sale Price
Unit Cost
Revenue
Customer Lifetime Value
A-Product Sales
B-Customers
Revenue and Quantity Sold by Location
Revenue (Count)
Quantity Sold (Sum)
Marketing Response by Department
Coupon Response
Coupon 1
Coupon 2
Coupon 3
Coupon 4
Coupon 5
Coupon 6
No visualization selected
Select a visualization to manage the field settings.
Type here to search
5°C
ENG
20:33
30-01-2023


IBM Cognos Analytics with Watson
* Simple dashboard
Edit
Analytics
Filters
Fields
Properties
Selected sources /
CustomerLoyaltyProgram.xlsx
Search
Education
Location Code
Income
Marital Status
Order Year
Quarter
MonthsAsMember
LoyaltyStatus
Product Line
Coupon Response
Count
Quantity Sold
Unit Sale Price
Unit Cost
Revenue
Customer Lifetime Value
A-Product Sales
B-Customers
Revenue and Quantity Sold by Location
Revenue (Count)
Quantity Sold (Sum)
Marketing Response by Department
Coupon Response
Income and Quantity Sold by City
Column
Quantity Sold (Sum)
Line
Income (Sum)
London
Toronto
Los Angeles
Montreal
Munchen
Birmingham
Vancouver
Miami
Frankfurt
Oxford
No visualization selected
Select a visualization to manage the field settings.
Type here to search
5°C
ENG
20:32
30-01-2023


IBM Cognos Analytics with Watson
Simple dashboard
Edit
Analytics
Filters
Fields
Properties
Selected sources
CustomerLoyaltyProgram.xlsx
Search
Education
Location Code
Income
Marital Status
Order Year
Quarter
MonthsAsMember
LoyaltyStatus
Product Line
Coupon Response
Count
Quantity Sold
Unit Sale Price
Unit Cost
Revenue
Customer Lifetime Value
A-Product Sales
B-Customers
Revenue and Quantity Sold by Location
Revenue (Count)
Quantity Sold (Sum)
Marketing Response by Department
Coupon Response
Coupon 1
Coupon 2
Coupon 3
Coupon 4
Coupon 5
Coupon 6
Computers and Ho...
Kitchen Appliances
Photography
Smart Electronics
TV and Video Gami...
Customer Lifetime Value and Quantity Sold by City
Column
Quantity Sold (Sum)
Line
Income (Sum)
London
Birmingham
Toronto
Vancouver
Los Angeles
Miami
Montreal
Frankfurt
Munchen
City
Department Sales By Loyalty Status
Quantity Sold (Sum)
LoyaltyStatus
Bronze
Elite
Gold
Platinum
Silver
VIP
Type here to search
ENG
22:07
29-01-2023

Analysis Using Python

```
In [1]: import warnings
        warnings.filterwarnings('ignore')

In [2]: import numpy as np
        import pandas as pd

In [4]: advertising = pd.read_csv("Company_data.csv")
        advertising
```

Out[4]:

	TV	Radio	Newspaper	Sales
0	230.1	37.8	69.2	22.1
1	44.5	39.3	45.1	10.4
2	17.2	45.9	69.3	12.0
3	151.5	41.3	58.5	16.5
4	180.8	10.8	58.4	17.9
...	...	...	...	...
195	38.2	3.7	13.8	7.6
196	94.2	4.9	8.1	14.0
197	177.0	9.3	6.4	14.8
198	283.6	42.0	66.2	25.5
199	232.1	8.6	8.7	18.4

200 rows × 4 columns

```
In [6]: advertising.shape
```

```
Out[6]: (200, 4)
```

jupyter DA_python Last Checkpoint: 16 hours ago (autosaved) Logout

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3

Run Code

```
In [7]: advertising.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 200 entries, 0 to 199
Data columns (total 4 columns):
 #   Column     Non-Null Count  Dtype
---  ------     --------------  -----
 0   TV         200 non-null    float64
 1   Radio      200 non-null    float64
 2   Newspaper  200 non-null    float64
 3   Sales      200 non-null    float64
dtypes: float64(4)
memory usage: 6.4 KB
```

```
In [8]: advertising.describe()
```

Out[8]:

	TV	Radio	Newspaper	Sales
count	200.000000	200.000000	200.000000	200.000000
mean	147.042500	23.264000	30.554000	15.130500
std	85.854236	14.846809	21.778621	5.283892
min	0.700000	0.000000	0.300000	1.600000
25%	74.375000	9.975000	12.750000	11.000000
50%	149.750000	22.900000	25.750000	16.000000
75%	218.825000	36.525000	45.100000	19.050000
max	296.400000	49.600000	114.000000	27.000000

jupyter DA_python Last Checkpoint: 16 hours ago (autosaved)

Logout

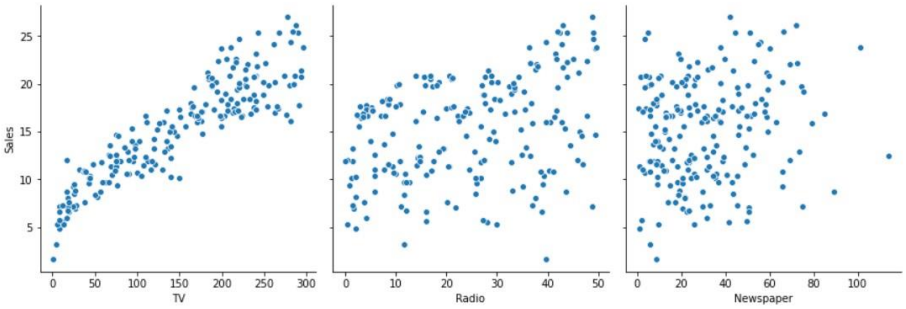
File Edit View Insert Cell Kernel Widgets Help

Trusted | Python 3

Run Code

In [9]:
```
import matplotlib.pyplot as plt
import seaborn as sns
```

In [10]:
```
sns.pairplot(advertising, x_vars=['TV','Radio','Newspaper'],y_vars='Sales',size =4,aspect =1,kind='scatter')
plt.show()
```



jupyter DA_python Last Checkpoint: 16 hours ago (autosaved)

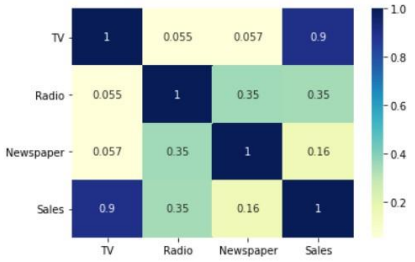
Logout

File Edit View Insert Cell Kernel Widgets Help

Trusted | Python 3

Run Code

In [13]:
```
sns.heatmap(advertising.corr(),cmap="YlGnBu",annot = True)
plt.show()
```



jupyter DA_python Last Checkpoint: 16 hours ago (autosaved)

Logout

File Edit View Insert Cell Kernel Widgets Help

Trusted | Python 3

Run Code

In [14]:
```
X=advertising['TV']
y=advertising['Sales']
```

In [15]:
```
from sklearn.model_selection import train_test_split
X_train,X_test,y_train,y_test =train_test_split(X,y,train_size=0.7,test_size=0.3,random_state=100)
```

In [16]:
```
X_train
y_train
```

Out[16]:
```
74     17.0
3      16.5
185    22.6
26     15.0
90     14.0
       ...
87     16.0
103    19.7
67     13.4
24      9.7
8       4.8
Name: Sales, Length: 140, dtype: float64
```

jupyter DA_python Last Checkpoint: 16 hours ago (autosaved)

Logout

File Edit View Insert Cell Kernel Widgets Help

Trusted | Python 3

Run Code

In [19]:
```
import statsmodels.api as sm
X_train_sm=sm.add_constant(X_train)
```

In [20]:
```
lr=sm.OLS(y_train,X_train_sm).fit()
```

In [21]:
```
lr.params
```

Out[21]:
```
const    6.948683
TV       0.054546
dtype: float64
```

jupyter DA_python Last Checkpoint: 16 hours ago (autosaved)

Logout

File Edit View Insert Cell Kernel Widgets Help

Trusted | Python 3

Run Code

In [22]:
```
lr.summary()
```

Out[22]:

OLS Regression Results

Dep. Variable:	Sales	**R-squared:**	0.816
Model:	OLS	**Adj. R-squared:**	0.814
Method:	Least Squares	**F-statistic:**	611.2
Date:	Sun, 29 Jan 2023	**Prob (F-statistic):**	1.52e-52
Time:	23:56:59	**Log-Likelihood:**	-321.12
No. Observations:	140	**AIC:**	646.2
Df Residuals:	138	**BIC:**	652.1
Df Model:	1		
Covariance Type:	nonrobust		

	coef	std err	t	P>|t|	[0.025	0.975]
const	6.9487	0.385	18.068	0.000	6.188	7.709
TV	0.0545	0.002	24.722	0.000	0.050	0.059

Omnibus:	0.027	**Durbin-Watson:**	2.196
Prob(Omnibus):	0.987	**Jarque-Bera (JB):**	0.150
Skew:	-0.006	**Prob(JB):**	0.928
Kurtosis:	2.840	**Cond. No.**	328.

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

jupyter DA_python Last Checkpoint: 16 hours ago (autosaved)

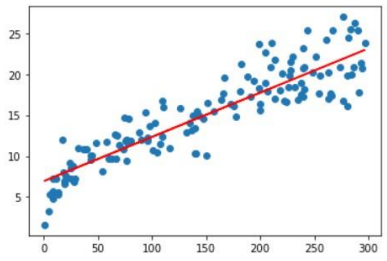
Logout

File Edit View Insert Cell Kernel Widgets Help

Trusted | Python 3

Run Code

In [23]:
```
plt.scatter(X_train,y_train)
plt.plot(X_train,6.948+.054*X_train,'r')
plt.show()
```



In [24]:
```
y_train_pred =lr.predict(X_train_sm)
```

In [25]:
```
res=(y_train-y_train_pred)
```

In [26]:
```
fig=plt.figure()
```

```
<Figure size 432x288 with 0 Axes>
```

jupyter DA_python Last Checkpoint: 19 hours ago (autosaved)

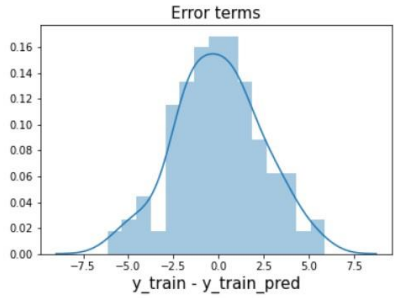
Logout

File Edit View Insert Cell Kernel Widgets Help

Trusted Python 3

Run Code

In [28]:
```
sns.distplot(res,bins =15)
plt.title('Error terms', fontsize=15)
plt.xlabel('y_train - y_train_pred',fontsize=15)
plt.show()
```



jupyter DA_python Last Checkpoint: 19 hours ago (autosaved)

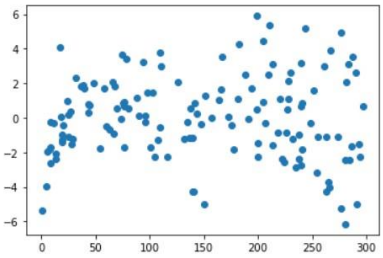
Logout

File Edit View Insert Cell Kernel Widgets Help

Trusted Python 3

Run Code

In [29]:
```
plt.scatter(X_train,res)
plt.show()
```



jupyter DA_python Last Checkpoint: 19 hours ago (autosaved)

Logout

File Edit View Insert Cell Kernel Widgets Help

Trusted Python 3

Run Code

In [31]:
```
X_test_sm=sm.add_constant(X_test)
y_test_pred = lr.predict(X_test_sm)
y_test_pred
```

Out[31]:
```
126     7.374140
104    19.941482
99     14.323269
92     18.823294
111    20.132392
167    18.228745
116    14.541452
96     17.726924
52     18.752384
69     18.774202
164    13.341445
124    19.466933
182    10.014155
154    17.192376
125    11.705073
196    12.086893
194    15.114182
177    16.232370
163    15.866914
31     13.106899
11     18.659656
73     14.006904
15     17.606923
41     16.603281
97     17.034193
128    18.965113
133    18.937840
82     11.055978
139    17.034193
123    13.663265
83     10.679613
65     10.712340
```

jupyter DA_python Last Checkpoint: 19 hours ago (autosaved)

Logout

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3

Run Code

```
151    13.548719
162    17.225103
170     9.675971
77     13.521446
32     12.250530
173    16.134188
174    19.079659
85     17.486923
168    18.697838
112    16.532372
171    15.921460
181    18.866930
7      13.505083
46     11.841437
75      7.870506
28     20.519667
29     10.799613
195     9.032331
40     17.994198
153    16.292371
115    11.045069
64     14.099631
59     18.441473
1       9.375969
192     7.886870
136     8.345054
152    17.726924
161    11.623254
dtype: float64
```

In [32]:
```
from sklearn.metrics import r2_score
r_squared = r2_score(y_test,y_test_pred)
r_squared
```

Out[32]: 0.7921031601245658

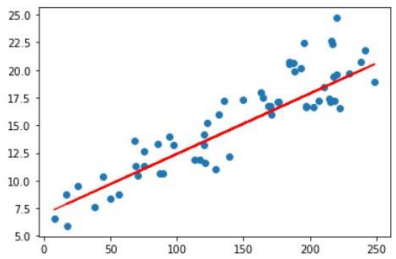
jupyter DA_python Last Checkpoint: 19 hours ago (autosaved)

Logout

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3

Run Code

In [33]:
```
plt.scatter(X_test,y_test)
plt.plot(X_test,y_test_pred,'r')
plt.show()
```



In [35]:
```
from sklearn.model_selection import train_test_split
X_train_lm,X_test_lm,y_train_lm,y_test_lm = train_test_split(X,y,train_size =0.7,test_size =0.3,random_state= 100)
X_train_lm.shape
X_train_lm =X_train_lm.values.reshape(-1,1)
X_test_lm=X_test_lm.values.reshape(-1,1)
print(X_train_lm.shape)
print(X_test_lm.shape)
```

```
(140, 1)
(60, 1)
```

jupyter DA_python Last Checkpoint: 19 hours ago (autosaved)

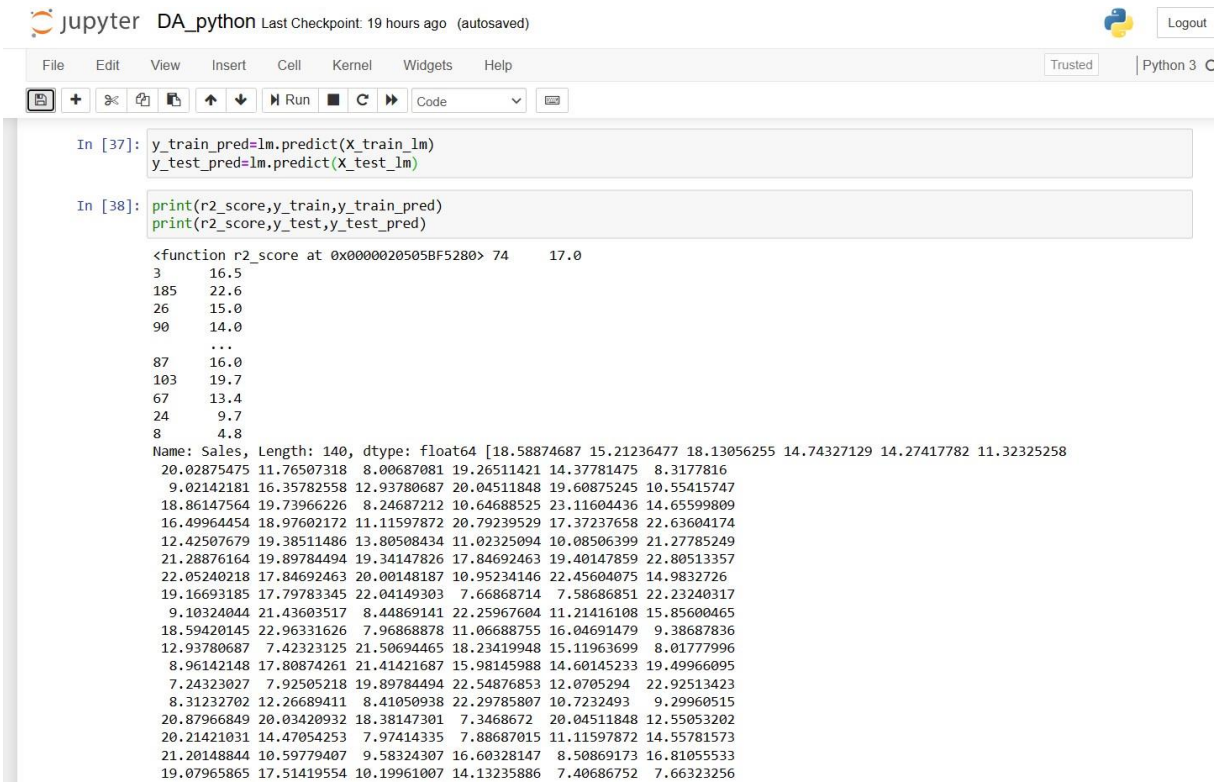
Logout

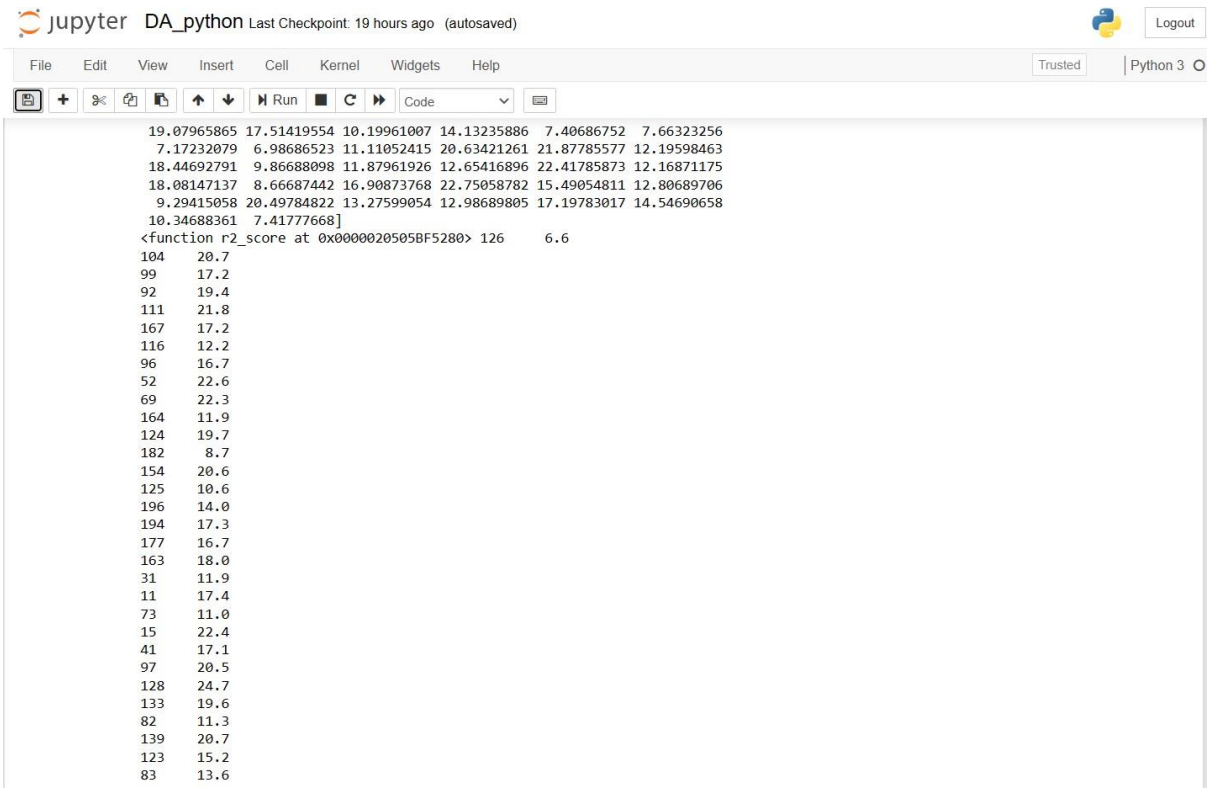
File Edit View Insert Cell Kernel Widgets Help Trusted Python 3

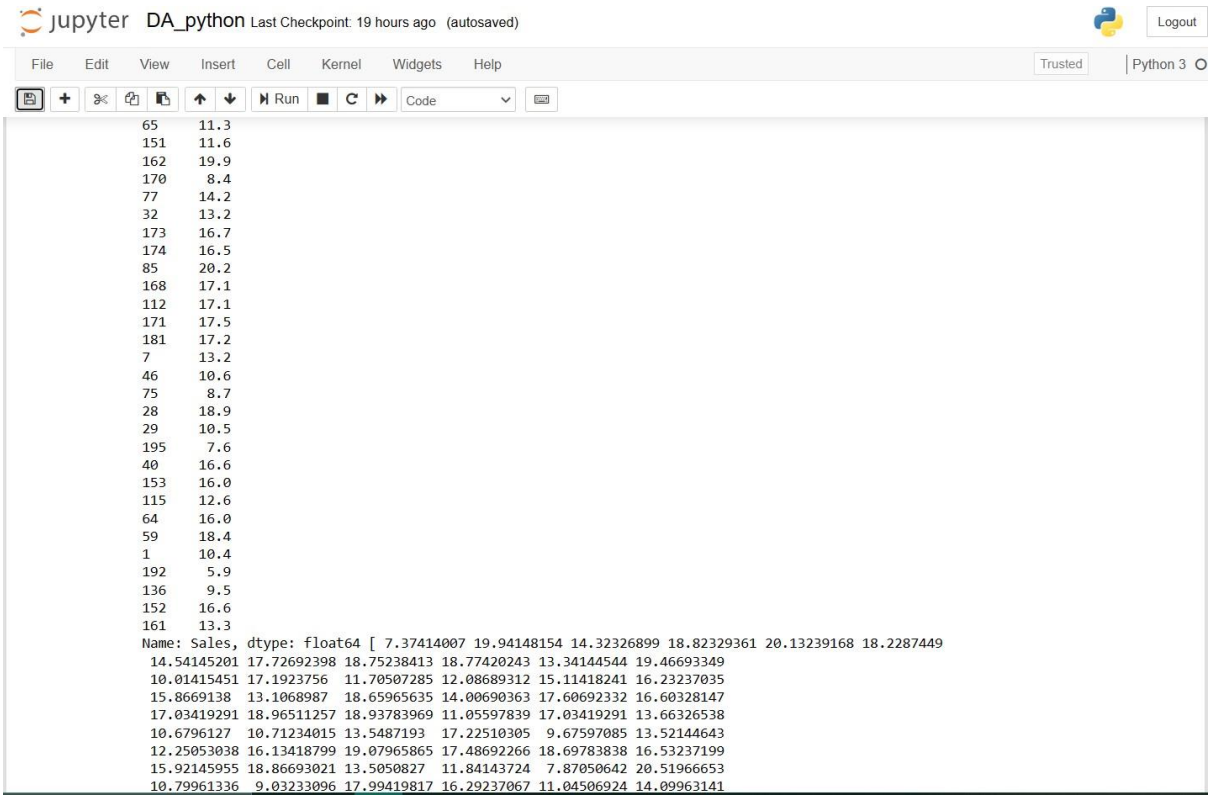
Run Code

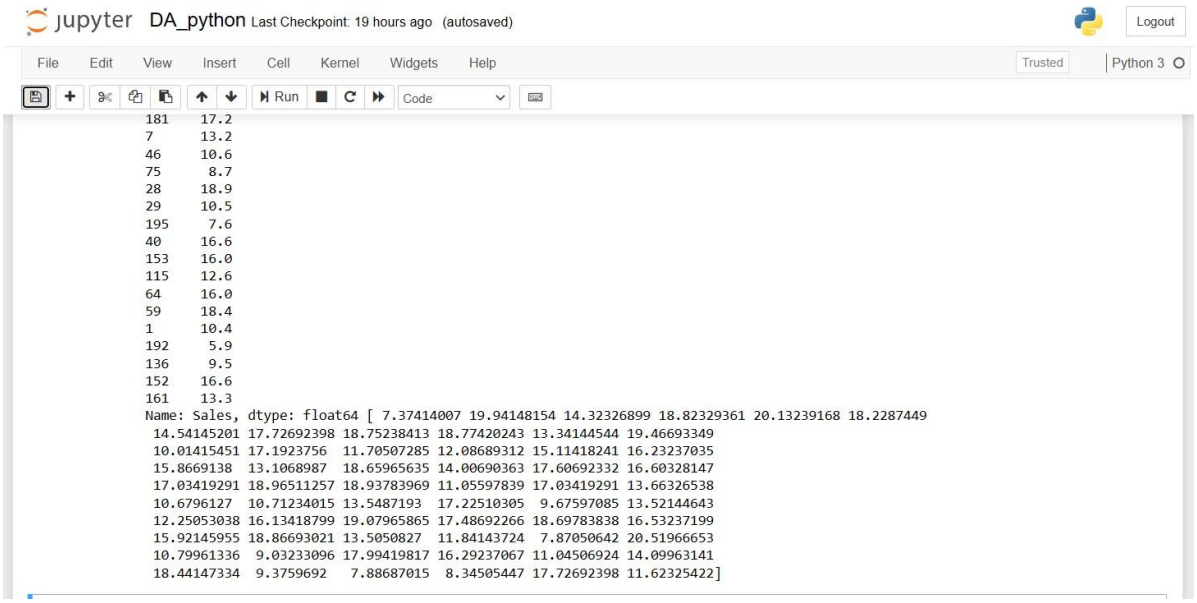
In [36]:
```
from sklearn.linear_model import LinearRegression
lm=LinearRegression()
lm.fit(X_train_lm,y_train_lm)
print("Intercept:",lm.intercept_)
print('slope',lm.coef_)
```

```
Intercept: 6.948683200001357
slope [0.05454575]
```

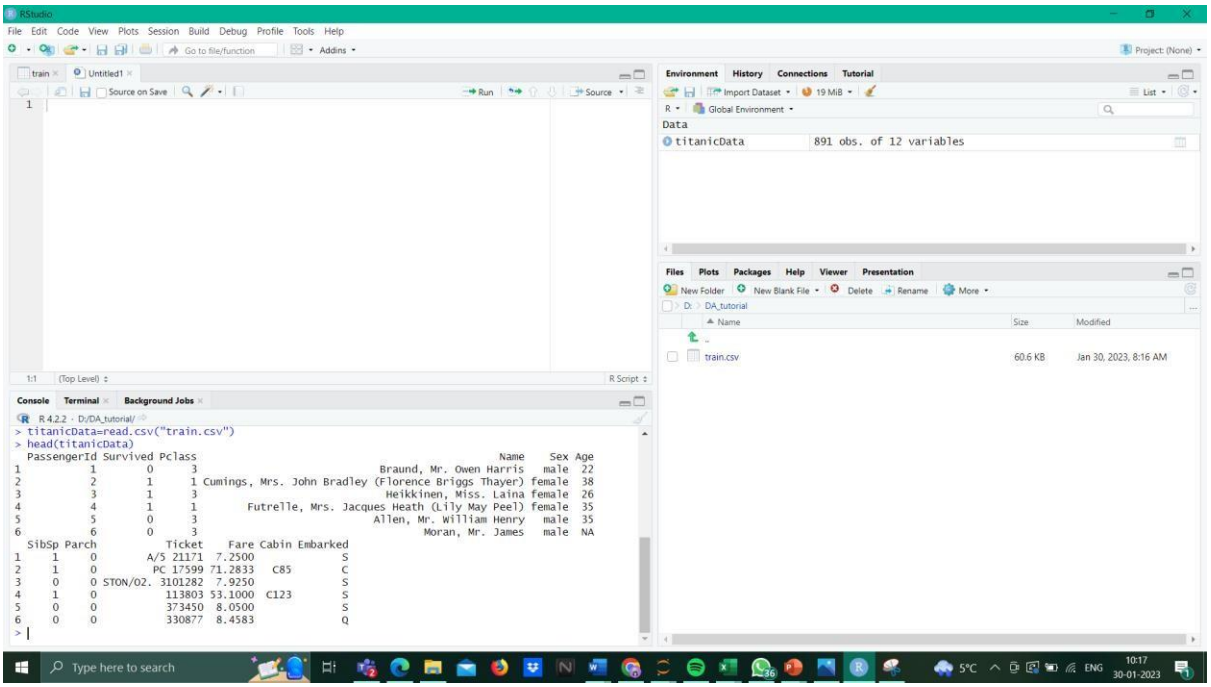

jupyter DA_python Last Checkpoint: 19 hours ago (autosaved)
Logout
File Edit View Insert Cell Kernel Widgets Help
Trusted
Python 3
Run
Code
In [37]:
y_train_pred=lm.predict(X_train_lm)
y_test_pred=lm.predict(X_test_lm)
In [38]:
print(r2_score,y_train,y_train_pred)
print(r2_score,y_test,y_test_pred)
<function r2_score at 0x0000020505BF5280> 74 17.0
3 16.5
185 22.6
26 15.0
90 14.0
... 87 16.0
103 19.7
67 13.4
24 9.7
8 4.8
Name: Sales, Length: 140, dtype: float64 [18.58874687 15.21236477 18.13056255 14.74327129 14.27417782 11.32325258
20.02875475 11.76507318 8.00687081 19.26511421 14.37781475 8.3177816
9.02142181 16.35782558 12.93780687 20.04511848 19.60875245 10.55415747
18.86147564 19.73966226 8.24687212 10.64688525 23.11604436 14.65599809
16.49964454 18.97602172 11.11597872 20.79239529 17.37237658 22.63604174
12.42507679 19.38511486 13.80508434 11.02325094 10.08506399 21.27785249
21.28876164 19.89784494 19.34147826 17.84692463 19.40147859 22.80513357
22.05240218 17.84692463 20.00148187 10.95234146 22.45604075 14.9832726
19.16693185 17.79783345 22.04149303 7.66868714 7.58686851 22.23240317
9.10324044 21.43603517 8.44869141 22.25967604 11.21416108 15.85600465
18.59420145 22.96331626 7.96868878 11.06688755 16.04691479 9.38687836
12.93780687 7.42323125 21.50694465 18.23419948 15.11963699 8.01777996
8.96142148 17.80874261 21.41421687 15.98145988 14.60145233 19.49966095
7.24323027 7.92505218 19.89784494 22.54876853 12.0705294 22.92513423
8.31232702 12.26689411 8.41050938 22.29785807 10.7232493 9.29960515
20.87966849 20.03420932 18.38147301 7.3468672 20.04511848 12.55053202
20.21421031 14.47054253 7.97414335 7.88687015 11.11597872 14.55781573
21.20148844 10.59779407 9.58324307 16.60328147 8.50869173 16.81055533
19.07965865 17.51419554 10.19961007 14.13235886 7.40686752 7.66323256

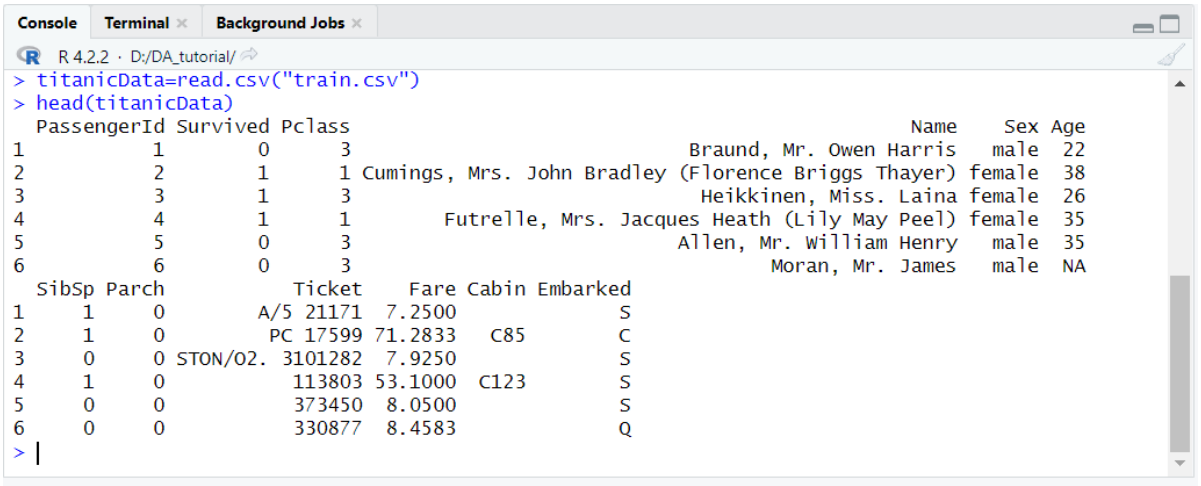

jupyter DA_python Last Checkpoint: 19 hours ago (autosaved)
Logout
File Edit View Insert Cell Kernel Widgets Help
Trusted
Python 3
Run
Code
19.07965865 17.51419554 10.19961007 14.13235886 7.40686752 7.66323256
7.17232079 6.98686523 11.11052415 20.63421261 21.87785577 12.19598463
18.44692791 9.86688098 11.87961926 12.65416896 22.41785873 12.16871175
18.08147137 8.66687442 16.90873768 22.75058782 15.49054811 12.80689706
9.29415058 20.49784822 13.27599054 12.98689805 17.19783017 14.54690658
10.34688361 7.41777668]
<function r2_score at 0x0000020505BF5280> 126 6.6
104 20.7
99 17.2
92 19.4
111 21.8
167 17.2
116 12.2
96 16.7
52 22.6
69 22.3
164 11.9
124 19.7
182 8.7
154 20.6
125 10.6
196 14.0
194 17.3
177 16.7
163 18.0
31 11.9
11 17.4
73 11.0
15 22.4
41 17.1
97 20.5
128 24.7
133 19.6
82 11.3
139 20.7
123 15.2
83 13.6


jupyter DA_python Last Checkpoint: 19 hours ago (autosaved)
Logout
File Edit View Insert Cell Kernel Widgets Help
Trusted
Python 3
Run
Code
65 11.3
151 11.6
162 19.9
170 8.4
77 14.2
32 13.2
173 16.7
174 16.5
85 20.2
168 17.1
112 17.1
171 17.5
181 17.2
7 13.2
46 10.6
75 8.7
28 18.9
29 10.5
195 7.6
40 16.6
153 16.0
115 12.6
64 16.0
59 18.4
1 10.4
192 5.9
136 9.5
152 16.6
161 13.3
Name: Sales, dtype: float64 [7.37414007 19.94148154 14.32326899 18.82329361 20.13239168 18.2287449
14.54145201 17.72692398 18.75238413 18.77420243 13.34144544 19.46693349
10.01415451 17.1923756 11.70507285 12.08689312 15.11418241 16.23237035
15.8669138 13.1068987 18.65965635 14.00690363 17.60692332 16.60328147
17.03419291 18.96511257 18.93783969 11.05597839 17.03419291 13.66326538
10.6796127 10.71234015 13.5487193 17.22510305 9.67597085 13.52144643
12.25053038 16.13418799 19.07965865 17.48692266 18.69783838 16.53237199
15.92145955 18.86693021 13.5050827 11.84143724 7.87050642 20.51966653
10.79961336 9.03233096 17.99419817 16.29237067 11.04506924 14.09963141


jupyter DA_python Last Checkpoint: 19 hours ago (autosaved)
Logout
File Edit View Insert Cell Kernel Widgets Help
Trusted
Python 3
Run
Code
181 17.2
7 13.2
46 10.6
75 8.7
28 18.9
29 10.5
195 7.6
40 16.6
153 16.0
115 12.6
64 16.0
59 18.4
1 10.4
192 5.9
136 9.5
152 16.6
161 13.3
Name: Sales, dtype: float64 [7.37414007 19.94148154 14.32326899 18.82329361 20.13239168 18.2287449
14.54145201 17.72692398 18.75238413 18.77420243 13.34144544 19.46693349
10.01415451 17.1923756 11.70507285 12.08689312 15.11418241 16.23237035
15.8669138 13.1068987 18.65965635 14.00690363 17.60692332 16.60328147
17.03419291 18.96511257 18.93783969 11.05597839 17.03419291 13.66326538
10.6796127 10.71234015 13.5487193 17.22510305 9.67597085 13.52144643
12.25053038 16.13418799 19.07965865 17.48692266 18.69783838 16.53237199
15.92145955 18.86693021 13.5050827 11.84143724 7.87050642 20.51966653
10.79961336 9.03233096 17.99419817 16.29237067 11.04506924 14.09963141
18.44147334 9.3759692 7.88687015 8.34505447 17.72692398 11.62325422]

Analysis Using R

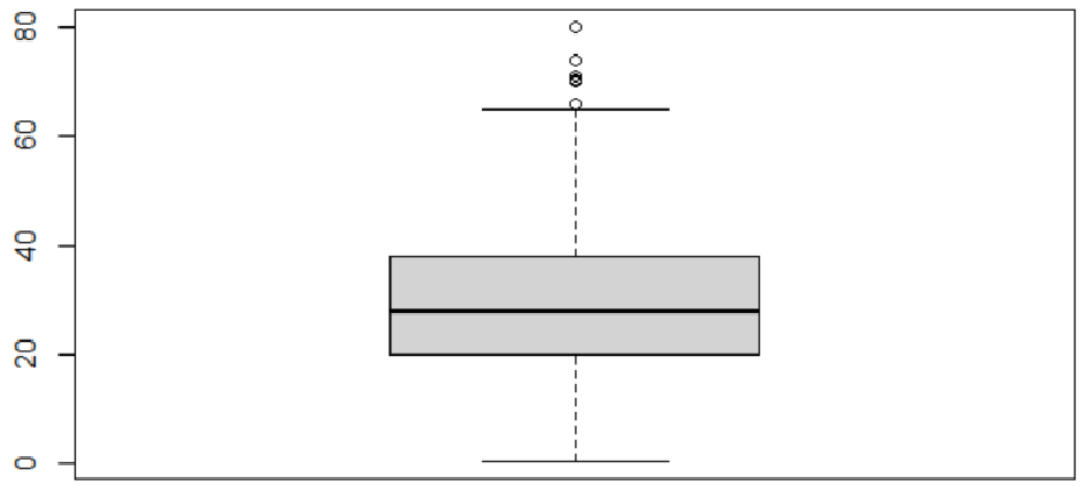




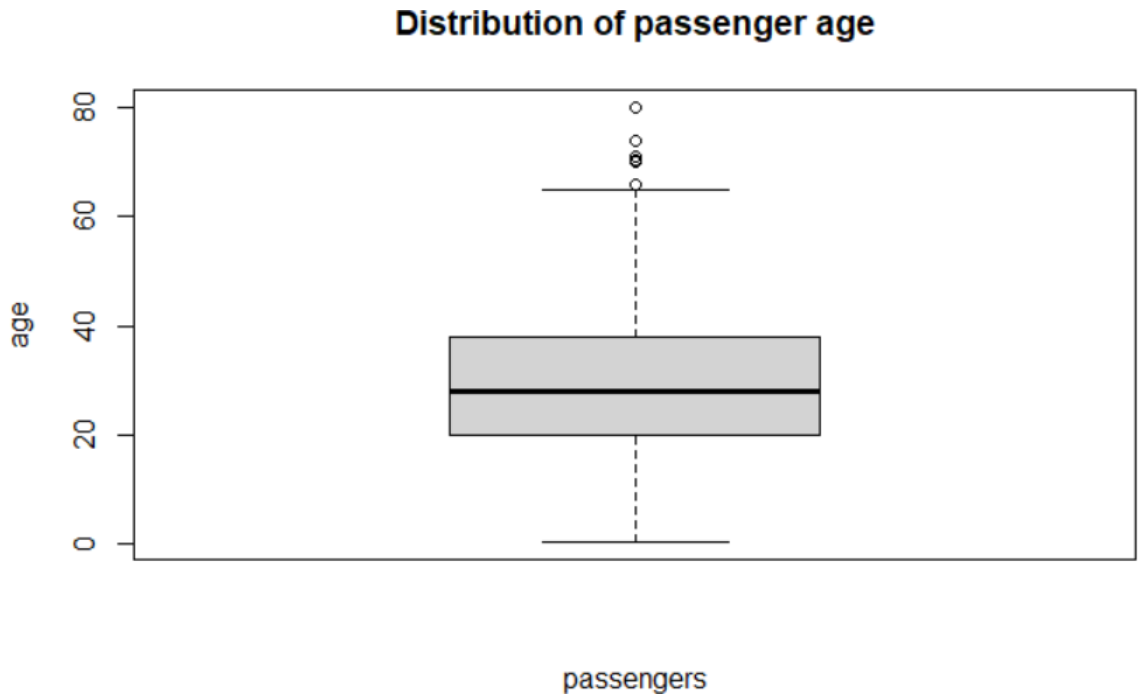
```
Console   Terminal ×   Background Jobs ×
R 4.2.2 · D:/DA_tutorial/
6      0      0              330877   8.4583                Q
> summary(titanicData)
  PassengerId       Survived          Pclass          Name               Sex
 Min.   :  1.0   Min.   :0.0000   Min.   :1.000   Length:891         Length:891
 1st Qu.:223.5   1st Qu.:0.0000   1st Qu.:2.000   Class :character   Class :character
 Median :446.0   Median :0.0000   Median :3.000   Mode  :character   Mode  :character
 Mean   :446.0   Mean   :0.3838   Mean   :2.309
 3rd Qu.:668.5   3rd Qu.:1.0000   3rd Qu.:3.000
 Max.   :891.0   Max.   :1.0000   Max.   :3.000

      Age             SibSp           Parch           Ticket              Fare
 Min.   : 0.42   Min.   :0.000   Min.   :0.0000   Length:891         Min.   :  0.00
 1st Qu.:20.12   1st Qu.:0.000   1st Qu.:0.0000   Class :character   1st Qu.:  7.91
 Median :28.00   Median :0.000   Median :0.0000   Mode  :character   Median : 14.45
 Mean   :29.70   Mean   :0.523   Mean   :0.3816                      Mean   : 32.20
 3rd Qu.:38.00   3rd Qu.:1.000   3rd Qu.:0.0000                      3rd Qu.: 31.00
 Max.   :80.00   Max.   :8.000   Max.   :6.0000                      Max.   :512.33
 NA's   :177
    Cabin             Embarked
 Length:891         Length:891
 Class :character   Class :character
 Mode  :character   Mode  :character
```

```
> boxplot(titanicData$Age, data=titanicData)
```




```
> boxplot(titanicData$Age, data=titanicData, main="Distribution of passenger age",
+         xlab = "passengers", ylab = "age")
>
```




```
> boxplot(titanicData$Age, data=titanicData)
> boxplot(titanicData$Age, data=titanicData, main="Distribution of passenger age",
+         xlab = "passengers", ylab = "age")
>
> densityAge = density(titanicData$Age)
Error in density.default(titanicData$Age) : 'x' contains missing values
>
```

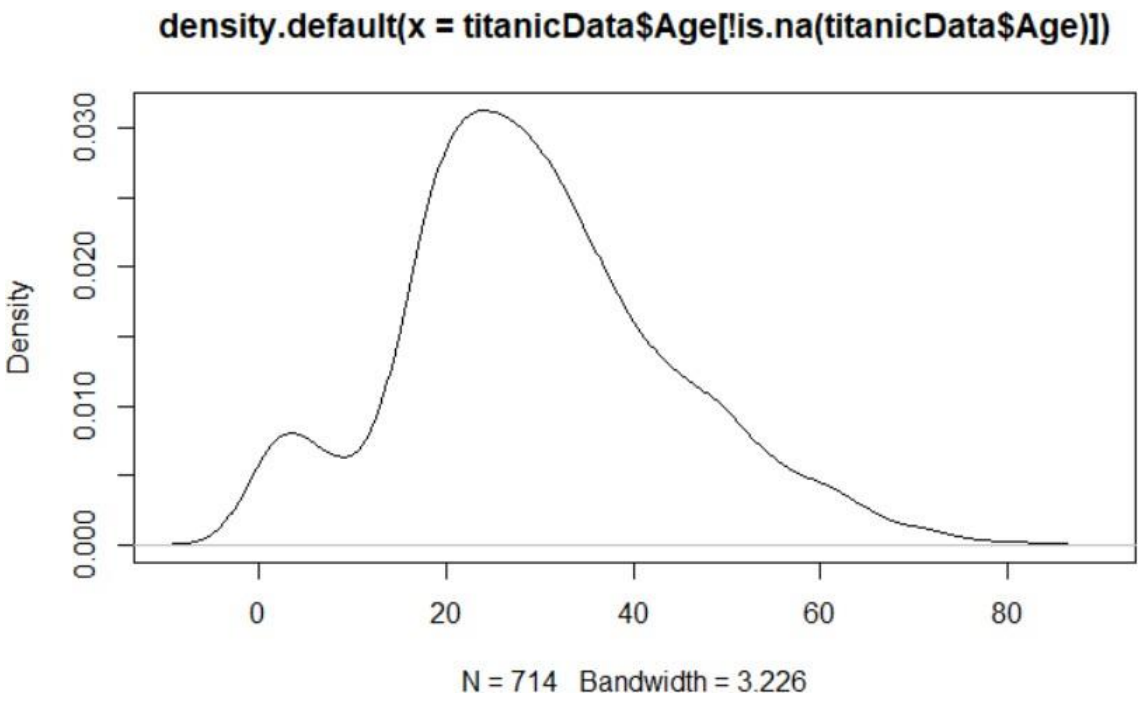
Console | Terminal | Background Jobs

R 4.2.2 · D:/DA_tutorial/

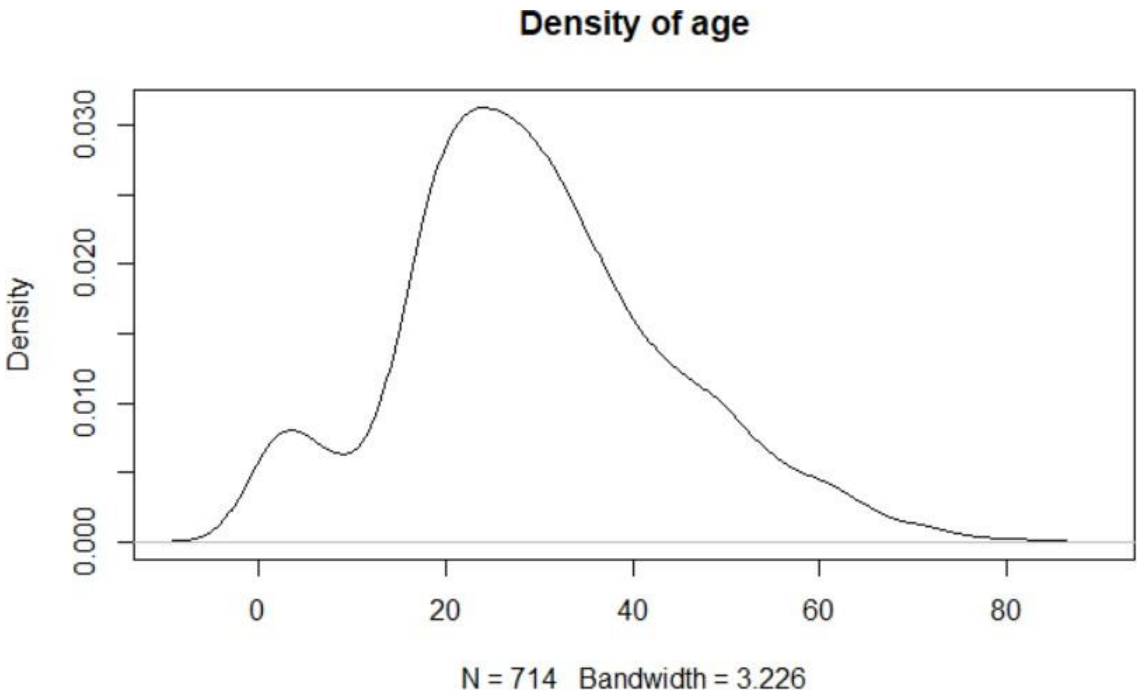
```
> is.na(titanicData$Age)
  [1] FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
 [16] FALSE FALSE  TRUE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE  TRUE  TRUE
 [31] FALSE  TRUE  TRUE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE
 [46]  TRUE  TRUE  TRUE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE
 [61] FALSE FALSE FALSE FALSE  TRUE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
 [76] FALSE  TRUE  TRUE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE
 [91] FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE
[106] FALSE FALSE  TRUE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
[121] FALSE  TRUE FALSE FALSE FALSE FALSE  TRUE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE
[136] FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
[151] FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE  TRUE FALSE FALSE FALSE FALSE FALSE
[166] FALSE  TRUE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE
[181]  TRUE  TRUE FALSE FALSE FALSE  TRUE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
[196] FALSE  TRUE FALSE  TRUE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
[211] FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE
[226] FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE
[241]  TRUE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE
[256] FALSE  TRUE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE
[271]  TRUE FALSE FALSE FALSE  TRUE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE
[286] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE  TRUE FALSE
[301]  TRUE  TRUE FALSE  TRUE  TRUE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
[316] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE
[331]  TRUE FALSE FALSE FALSE  TRUE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
[346] FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE  TRUE
[361] FALSE FALSE FALSE FALSE  TRUE FALSE FALSE  TRUE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE
[376]  TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE FALSE
[391] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
[406] FALSE FALSE FALSE FALSE  TRUE  TRUE  TRUE FALSE  TRUE FALSE  TRUE FALSE FALSE FALSE FALSE
[421]  TRUE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE  TRUE FALSE FALSE  TRUE FALSE FALSE FALSE
[436] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE
[451] FALSE  TRUE FALSE FALSE  TRUE FALSE FALSE  TRUE FALSE  TRUE FALSE FALSE FALSE FALSE  TRUE
[466] FALSE  TRUE FALSE  TRUE FALSE  TRUE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE
[481] FALSE  TRUE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE
[496]  TRUE FALSE  TRUE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE
[511] FALSE  TRUE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE  TRUE FALSE  TRUE
[526] FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE FALSE  TRUE FALSE FALSE FALSE FALSE  TRUE FALSE
[541] FALSE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE
[556] FALSE FALSE  TRUE FALSE FALSE  TRUE FALSE FALSE  TRUE  TRUE FALSE FALSE FALSE  TRUE FALSE
[571] FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE  TRUE
[586] FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE FALSE FALSE  TRUE FALSE  TRUE FALSE
```

```
[511] FALSE  TRUE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE  TRUE FALSE  TRUE
[526] FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE FALSE  TRUE FALSE FALSE FALSE FALSE  TRUE FALSE
[541] FALSE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE
[556] FALSE FALSE  TRUE FALSE FALSE  TRUE FALSE FALSE  TRUE  TRUE FALSE FALSE FALSE  TRUE FALSE
[571] FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE  TRUE
[586] FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE FALSE FALSE  TRUE FALSE  TRUE FALSE
[601] FALSE  TRUE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE  TRUE  TRUE FALSE
[616] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE
[631] FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE FALSE
[646] FALSE FALSE FALSE  TRUE FALSE  TRUE FALSE FALSE  TRUE FALSE FALSE  TRUE FALSE FALSE FALSE
[661] FALSE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE  TRUE FALSE FALSE FALSE FALSE  TRUE
[676] FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
[691] FALSE FALSE  TRUE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
[706] FALSE FALSE FALSE FALSE  TRUE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE
[721] FALSE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE
[736] FALSE FALSE FALSE  TRUE  TRUE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
[751] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE
[766] FALSE  TRUE FALSE  TRUE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE  TRUE FALSE  TRUE FALSE
[781] FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE  TRUE  TRUE FALSE
[796] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
[811] FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE
[826]  TRUE  TRUE FALSE  TRUE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE  TRUE FALSE  TRUE
[841] FALSE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE
[856] FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE  TRUE FALSE
[871] FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE  TRUE FALSE FALSE FALSE FALSE FALSE FALSE
[886] FALSE FALSE FALSE  TRUE FALSE FALSE
> 
```

```
> densityAge = density(titanicData$Age[!is.na(titanicData$Age)])
> plot(densityAge)
```




```
> plot(densityAge, main= "Density of age")
```




```
> summary(titanicData)
  PassengerId       Survived         Pclass          Name              Sex
 Min.   :  1.0   Min.   :0.0000   Min.   :1.000   Length:891         Length:891
 1st Qu.:223.5   1st Qu.:0.0000   1st Qu.:2.000   Class :character   Class :character
 Median :446.0   Median :0.0000   Median :3.000   Mode  :character   Mode  :character
 Mean   :446.0   Mean   :0.3838   Mean   :2.309
 3rd Qu.:668.5   3rd Qu.:1.0000   3rd Qu.:3.000
 Max.   :891.0   Max.   :1.0000   Max.   :3.000

      Age            SibSp           Parch           Ticket             Fare
 Min.   : 0.42   Min.   :0.000   Min.   :0.0000   Length:891         Min.   :  0.00
 1st Qu.:20.12   1st Qu.:0.000   1st Qu.:0.0000   Class :character   1st Qu.:  7.91
 Median :28.00   Median :0.000   Median :0.0000   Mode  :character   Median : 14.45
 Mean   :29.70   Mean   :0.523   Mean   :0.3816                      Mean   : 32.20
 3rd Qu.:38.00   3rd Qu.:1.000   3rd Qu.:0.0000                      3rd Qu.: 31.00
 Max.   :80.00   Max.   :8.000   Max.   :6.0000                      Max.   :512.33
 NA's   :177
    Cabin             Embarked
 Length:891         Length:891
 Class :character   Class :character
 Mode  :character   Mode  :character
```

```
> titanicData$Sex = as.factor(titanicData$Sex)
> titanicData$Survived = as.factor(titanicData$Survived)
> titanicData$Pclass = as.ordered(titanicData$Pclass)
> table(titanicData$Survived)

  0   1
549 342
> table(titanicData$Sex)

female   male
   314    577
> table(titanicData$Pclass)

  1   2   3
216 184 491
>
```

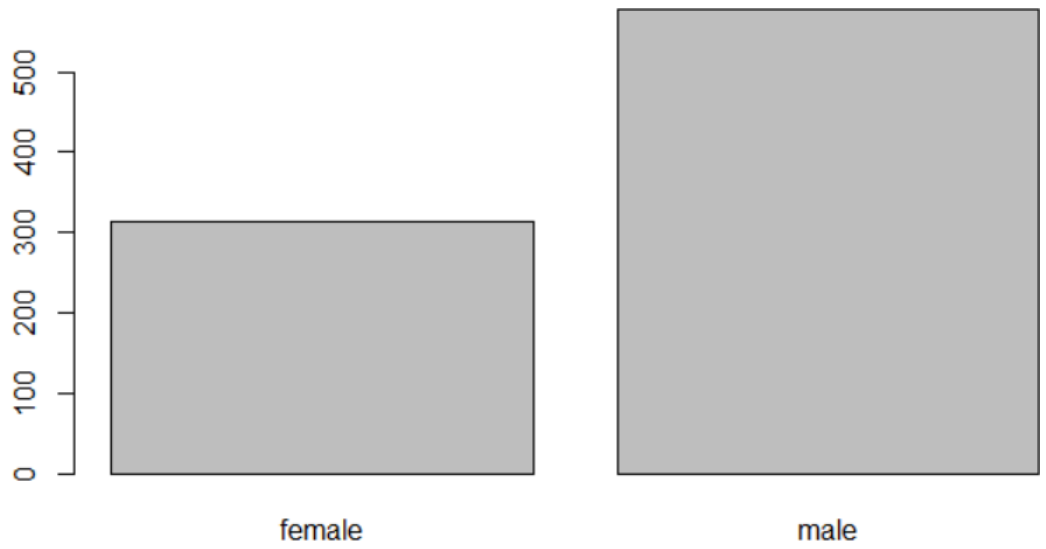
```
> table(titanicData$Sex, titanicData$Survived)

          0   1
  female  81 233
  male   468 109
```

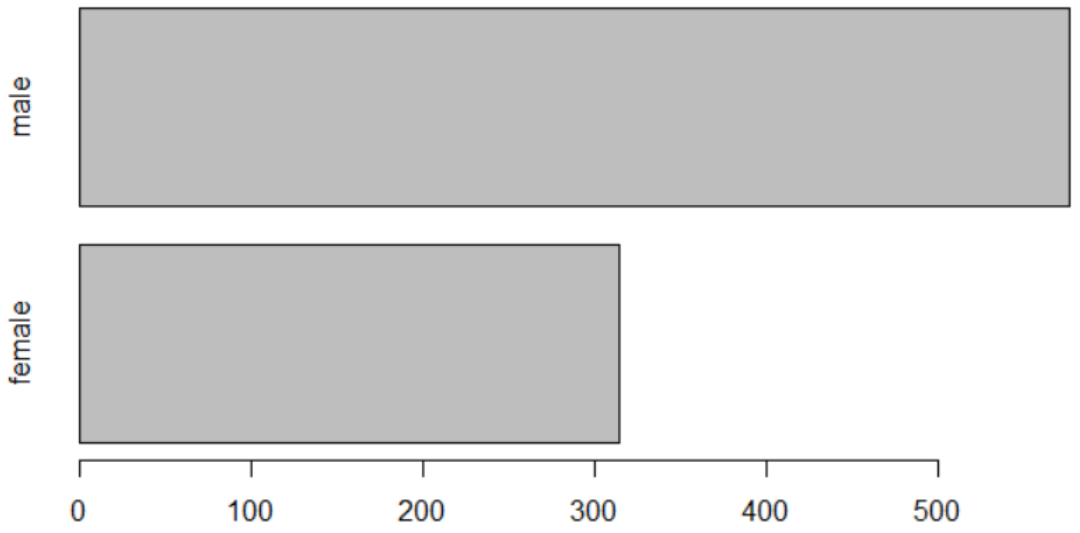
```
> table(titanicData$Pclass, titanicData$Survived)

     0   1
  1  80 136
  2  97  87
  3 372 119
```

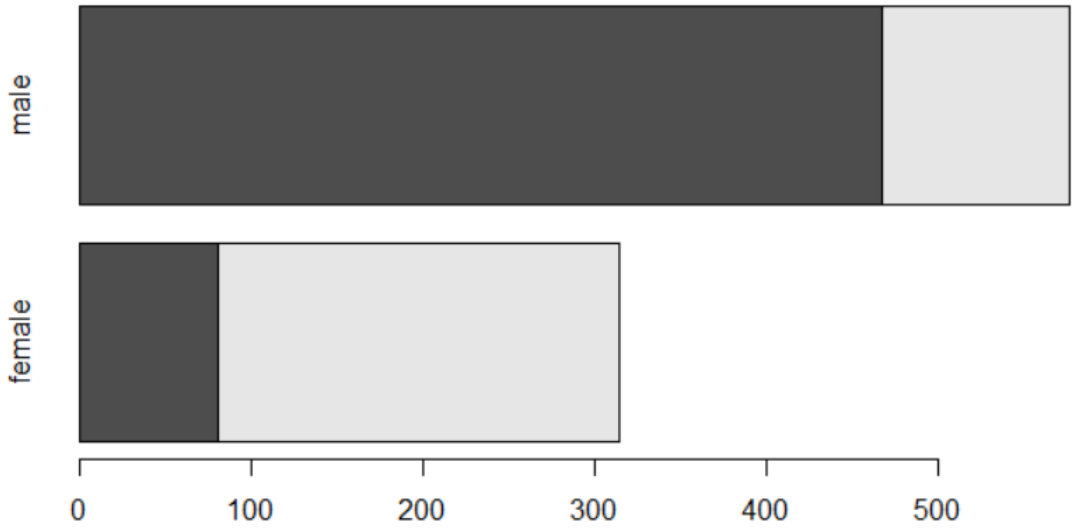
```
> barplot(counter)
```



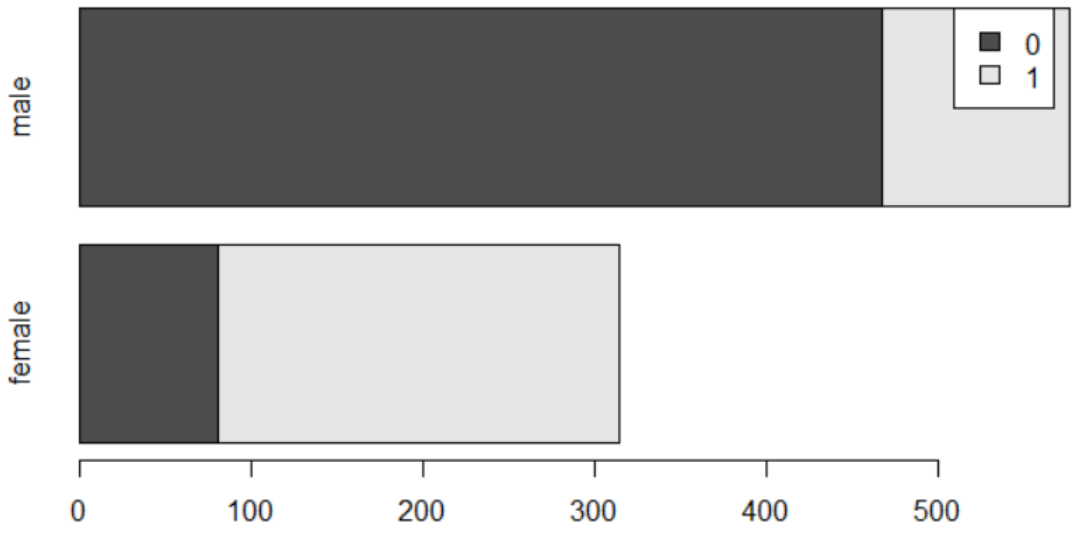
```
> barplot(counter,horiz=TRUE )
```



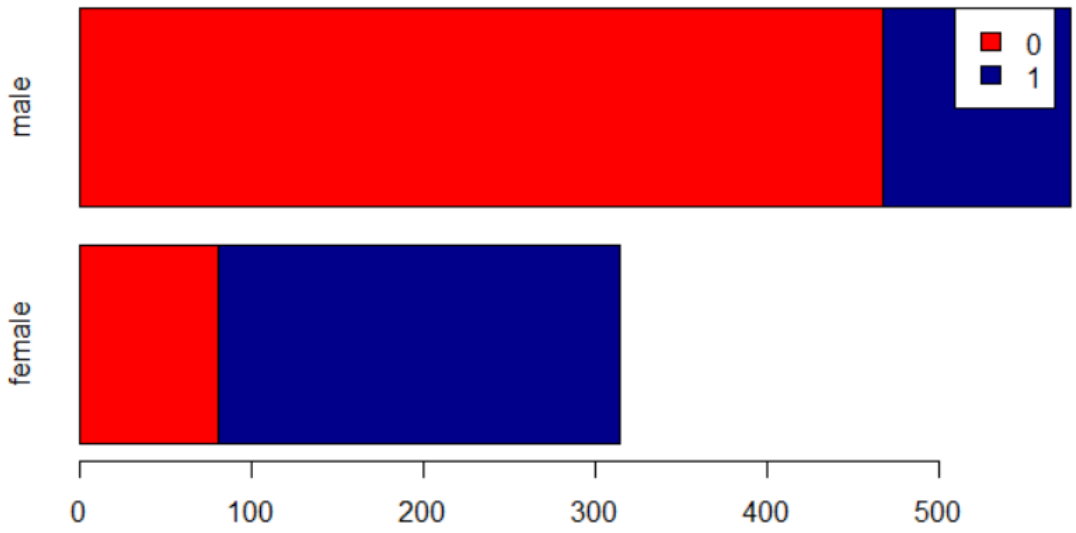

```
> counter = table(titanicData$Survived, titanicData$Sex)
> barplot(counter, horiz=TRUE)
```



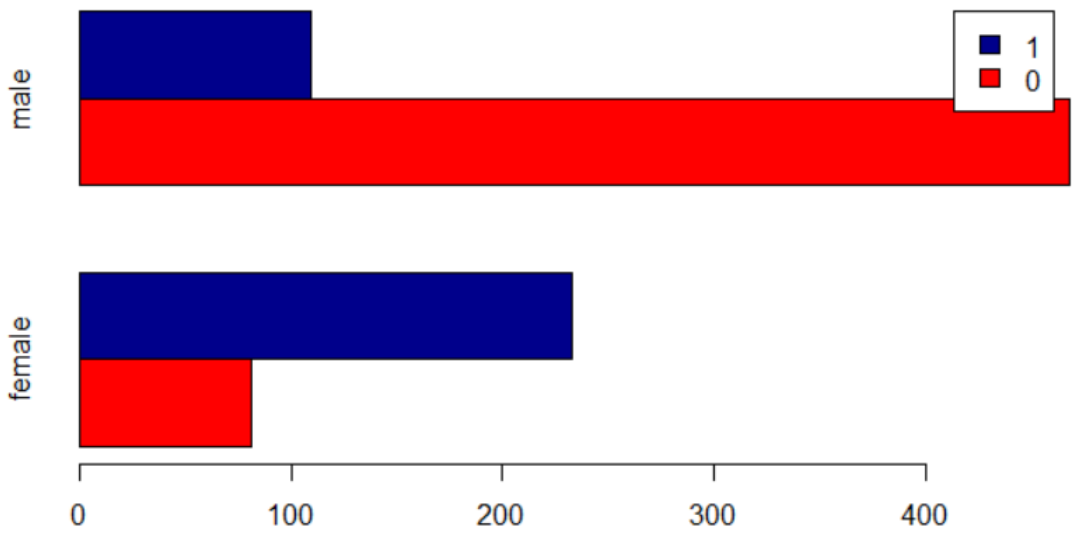
```
> barplot(counter, horiz=TRUE, legend = rownames(counter) )
```



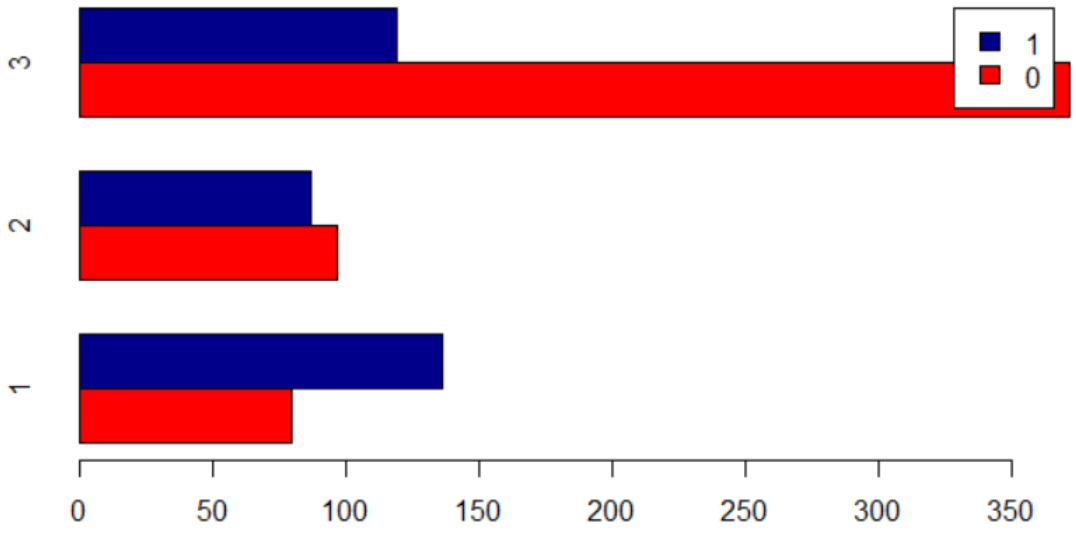

```
> barplot(counter, horiz=TRUE, legend = rownames(counter), col= c("red", "darkblue"))
```



```
> barplot(counter, horiz=TRUE, legend = rownames(counter), col= c("red","darkblue"), beside=TRUE)
```



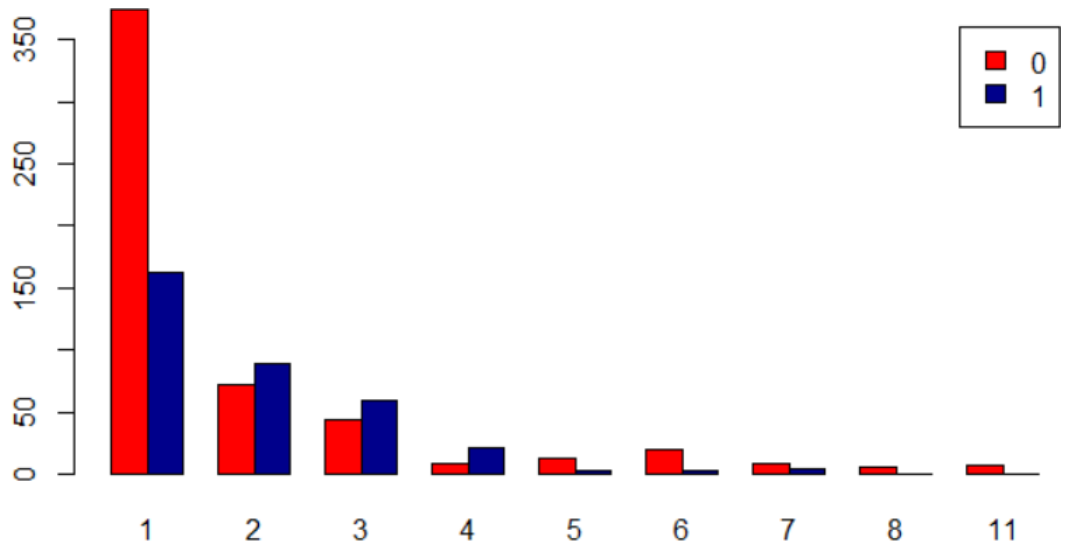
```
> counter = table(titanicData$Survived, titanicData$Pclass)
> barplot(counter, horiz=TRUE, legend= rownames(counter), col= c("red", "darkblue"),
+         beside=TRUE)
```




```
> titanicData$Child[titanicData$Age < 18] = 'Child'
> titanicData$Child[titanicData$Age >= 18] = 'Adult'
> table(titanicData$Child, titanicData$Survived)

         0   1
  Adult 372 229
  Child  52  61
```

```
> titanicData$Fsize = titanicData$SibSp + titanicData$Parch + 1
> counterNew = table(titanicData$Survived, titanicData$Fsize)
> barplot(counterNew,
+         legend = rownames(counter),
+         col= c("red", "darkblue"),
+         beside=TRUE)
```


0
1
350
250
150
50
0
1
2
3
4
5
6
7
8
11