Experiment No. 1

Exploratory Data Analysis

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Branch: BE-CSE **Section/Group: 607/A**
Semester: 5th **Subject: Machine Learning Lab**

1. **Aim:** We have to implement data analysis on the csv file named titanic train 1.csv. We will use pandas library as it is used for data cleaning and analysis.
2. **Software/Hardware Requirements:** Windows 7 & above version
3. **Tools to be used:**
    - Anaconda Navigator
    - Jupiter Notebook
4. **Implementation:**

In [3]:
```
#reading the csv file in dataframe
df=pd.read_csv("F:\\SEM-5\\ML\\titanic-train.csv")
print(df)
```

```
     PassengerId  Survived  Pclass  \
0              1         0       3
1              2         1       1
2              3         1       3
3              4         1       1
4              5         0       3
..           ...       ...     ...
886          887         0       2
887          888         1       1
888          889         0       3
889          890         1       1
890          891         0       3

                                                 Name  gender   Age  SibSp  \
0                             Braund, Mr. Owen Harris    male  22.0      1
1    Cumings, Mrs. John Bradley (Florence Briggs Th...  female  38.0      1
2                              Heikkinen, Miss. Laina  female  26.0      0
3        Futrelle, Mrs. Jacques Heath (Lily May Peel)  female  35.0      1
4                            Allen, Mr. William Henry    male  35.0      0
..                                                ...     ...   ...    ...
886                            Montvila, Rev. Juozas    male  27.0      0
887                     Graham, Miss. Margaret Edith  female  19.0      0
888         Johnston, Miss. Catherine Helen "Carrie"  female   NaN      1
889                            Behr, Mr. Karl Howell    male  26.0      0
890                              Dooley, Mr. Patrick    male  32.0      0

     Parch            Ticket     Fare Cabin Embarked
0        0         A/5 21171   7.2500   NaN        S
1        0          PC 17599  71.2833   C85        C
2        0  STON/O2. 3101282   7.9250   NaN        S
3        0            113803  53.1000  C123        S
4        0            373450   8.0500   NaN        S
..     ...               ...      ...   ...      ...
886      0            211536  13.0000   NaN        S
887      0            112053  30.0000   B42        S
888      2        W./C. 6607  23.4500   NaN        S
889      0            111369  30.0000  C148        C
890      0            370376   7.7500   NaN        Q

[891 rows x 12 columns]
```

In [4]:
```
#first 4 rows and 2 columns
df.iloc[0:4, 0:2]
```

Out[4]:

	PassengerId	Survived
0	1	0
1	2	1
2	3	1
3	4	1

In [5]:
```
#all rows and 2 columns
df.iloc[0:,0:2]
```

Out[5]:

	PassengerId	Survived
0	1	0
1	2	1
2	3	1
3	4	1
4	5	0
...	...	...
886	887	0
887	888	1
888	889	0
889	890	1
890	891	0

891 rows × 2 columns

Run Code

In [6]:
```
#all rows and all columns
df.iloc[0:,]
```

Out[6]:

	PassengerId	Survived	Pclass	Name	gender	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
0	1	0	3	Braund, Mr. Owen Harris	male	22.0	1	0	A/5 21171	7.2500	NaN	S
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th...	female	38.0	1	0	PC 17599	71.2833	C85	C
2	3	1	3	Heikkinen, Miss. Laina	female	26.0	0	0	STON/O2. 3101282	7.9250	NaN	S
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	0	113803	53.1000	C123	S
4	5	0	3	Allen, Mr. William Henry	male	35.0	0	0	373450	8.0500	NaN	S
...	...	...	...	...	...	...	...	...	...	...	...	...
886	887	0	2	Montvila, Rev. Juozas	male	27.0	0	0	211536	13.0000	NaN	S
887	888	1	1	Graham, Miss. Margaret Edith	female	19.0	0	0	112053	30.0000	B42	S
888	889	0	3	Johnston, Miss. Catherine Helen "Carrie"	female	NaN	1	2	W./C. 6607	23.4500	NaN	S
889	890	1	1	Behr, Mr. Karl Howell	male	26.0	0	0	111369	30.0000	C148	C
890	891	0	3	Dooley, Mr. Patrick	male	32.0	0	0	370376	7.7500	NaN	Q

891 rows × 12 columns

In [7]:
```
#all rows and 0th and 2nd column
df.iloc[0:,[0,2]]
```

Out[7]:

	PassengerId	Pclass
0	1	3
1	2	1
2	3	3
3	4	1
4	5	3
...	...	...
886	887	2
887	888	1
888	889	3
889	890	1
890	891	3

891 rows × 2 columns

In [8]:
```
#any specific row and columns
df.iloc[[1,4,6],[0,1]]
```

Out[8]:

	PassengerId	Survived
1	2	1
4	5	0
6	7	0

Run Code

In [10]:
```
#all rows and Name and Age column
df.loc[0:,["Name","Age"]]
```

Out[10]:

	Name	Age
0	Braund, Mr. Owen Harris	22.0
1	Cumings, Mrs. John Bradley (Florence Briggs Th...	38.0
2	Heikkinen, Miss. Laina	26.0
3	Futrelle, Mrs. Jacques Heath (Lily May Peel)	35.0
4	Allen, Mr. William Henry	35.0
...	...	...
886	Montvila, Rev. Juozas	27.0
887	Graham, Miss. Margaret Edith	19.0
888	Johnston, Miss. Catherine Helen "Carrie"	NaN
889	Behr, Mr. Karl Howell	26.0
890	Dooley, Mr. Patrick	32.0

891 rows × 2 columns

In [11]:
```
#correlation
cor=df.corr()
print(cor)
```

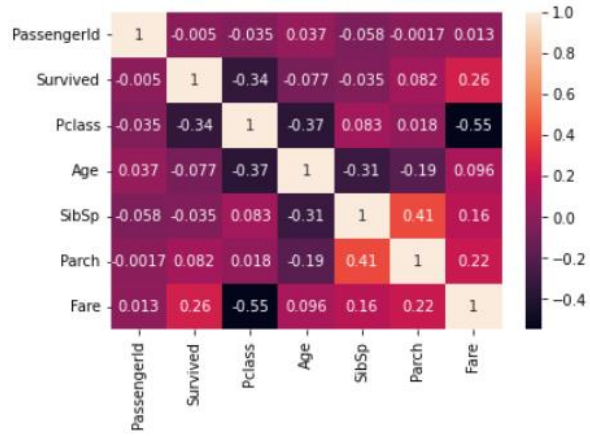
```
             PassengerId  Survived    Pclass       Age     SibSp     Parch  \
PassengerId     1.000000 -0.005007 -0.035144  0.036847 -0.057527 -0.001652
Survived       -0.005007  1.000000 -0.338481 -0.077221 -0.035322  0.081629
Pclass         -0.035144 -0.338481  1.000000 -0.369226  0.083081  0.018443
Age             0.036847 -0.077221 -0.369226  1.000000 -0.308247 -0.189119
SibSp          -0.057527 -0.035322  0.083081 -0.308247  1.000000  0.414838
Parch          -0.001652  0.081629  0.018443 -0.189119  0.414838  1.000000
Fare            0.012658  0.257307 -0.549500  0.096067  0.159651  0.216225

                 Fare
PassengerId  0.012658
Survived     0.257307
Pclass      -0.549500
Age          0.096067
SibSp        0.159651
Parch        0.216225
Fare         1.000000
```

In [12]:
```
#for making statistical graphics
import seaborn as sns
```

In [13]:
```
sns.heatmap(cor, annot=True)
```

Out[13]: <AxesSubplot:>



In [14]:
```
#using filter we can sort the data
filt=df["gender"]=="female"
df.loc[filt,]
```

Out[14]:

	PassengerId	Survived	Pclass	Name	gender	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th...	female	38.0	1	0	PC 17599	71.2833	C85	C
2	3	1	3	Heikkinen, Miss. Laina	female	26.0	0	0	STON/O2. 3101282	7.9250	NaN	S
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	0	113803	53.1000	C123	S
8	9	1	3	Johnson, Mrs. Oscar W (Elisabeth Vilhelmina Berg)	female	27.0	0	2	347742	11.1333	NaN	S
9	10	1	2	Nasser, Mrs. Nicholas (Adele Achem)	female	14.0	1	0	237736	30.0708	NaN	C
...	...	...	...	...	...	...	...	...	...	...	...	...
880	881	1	2	Shelley, Mrs. William (Imanita Parrish Hall)	female	25.0	0	1	230433	26.0000	NaN	S
882	883	0	3	Dahlberg, Miss. Gerda Ulrika	female	22.0	0	0	7552	10.5167	NaN	S
885	886	0	3	Rice, Mrs. William (Margaret Norton)	female	39.0	0	5	382652	29.1250	NaN	Q
887	888	1	1	Graham, Miss. Margaret Edith	female	19.0	0	0	112053	30.0000	B42	S
888	889	0	3	Johnston, Miss. Catherine Helen "Carrie"	female	NaN	1	2	W./C. 6607	23.4500	NaN	S

314 rows × 12 columns

In [15]:
```
#to calculate mean of Age column
agem=df["Age"].mean()
print(agem)
```

```
29.69911764705882
```

In [17]:
```
#is used to update the mean at the missing places in the online dataframe
#or we can also use this command to fill the mean at missing places
#df.fillna(mean, inplace=True)
df["Age"]=df["Age"].fillna(agem)
df
```

Out[17]:

	PassengerId	Survived	Pclass	Name	gender	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
0	1	0	3	Braund, Mr. Owen Harris	male	22.000000	1	0	A/5 21171	7.2500	NaN	S
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th...	female	38.000000	1	0	PC 17599	71.2833	C85	C
2	3	1	3	Heikkinen, Miss. Laina	female	26.000000	0	0	STON/O2. 3101282	7.9250	NaN	S
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.000000	1	0	113803	53.1000	C123	S
4	5	0	3	Allen, Mr. William Henry	male	35.000000	0	0	373450	8.0500	NaN	S
...	...	...	...	...	...	...	...	...	...	...	...	...
886	887	0	2	Montvila, Rev. Juozas	male	27.000000	0	0	211536	13.0000	NaN	S
887	888	1	1	Graham, Miss. Margaret Edith	female	19.000000	0	0	112053	30.0000	B42	S
888	889	0	3	Johnston, Miss. Catherine Helen "Carrie"	female	29.699118	1	2	W./C. 6607	23.4500	NaN	S
889	890	1	1	Behr, Mr. Karl Howell	male	26.000000	0	0	111369	30.0000	C148	C
890	891	0	3	Dooley, Mr. Patrick	male	32.000000	0	0	370376	7.7500	NaN	Q

891 rows × 12 columns

In [18]:
```
#is used to update the offline csv sheet
df.to_csv("F:\\SEM-5\\ML\\titanic-train - 1.csv")
```

Output:

Before updating the csv sheet:

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	PassengerI	Survived	Pclass	Name	gender	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked	
2	1	0	3	Braund, M	male	22	1	0	A/5 21171	7.25		S	
3	2	1	1	Cumings, M	female	38	1	0	PC 17599	71.2833	C85	C	
4	3	1	3	Heikkinen,	female	26	0	0	STON/O2.	7.925		S	
5	4	1	1	Futrelle, M	female	35	1	0	113803	53.1	C123	S	
6	5	0	3	Allen, Mr. '	male	35	0	0	373450	8.05		S	
7	6	0	3	Moran, Mr	male		0	0	330877	8.4583		Q	
8	7	0	1	McCarthy,	male	54	0	0	17463	51.8625	E46	S	
9	8	0	3	Palsson, M	male	2	3	1	349909	21.075		S	
10	9	1	3	Johnson, M	female	27	0	2	347742	11.1333		S	
11	10	1	2	Nasser, Mr	female	14	1	0	237736	30.0708		C	
12	11	1	3	Sandstrom	female	4	1	1	PP 9549	16.7	G6	S	
13	12	1	1	Bonnell, M	female	58	0	0	113783	26.55	C103	S	
14	13	0	3	Saunderco	male	20	0	0	A/5. 2151	8.05		S	
15	14	0	3	Andersson	male	39	1	5	347082	31.275		S	
16	15	0	3	Vestrom, M	female	14	0	0	350406	7.8542		S	
17	16	1	2	Hewlett, M	female	55	0	0	248706	16		S	
18	17	0	3	Rice, Mast	male	2	4	1	382652	29.125		Q	
19	18	1	2	Williams, M	male		0	0	244373	13		S	
20	19	0	3	Vander Pla	female	31	1	0	345763	18		S	
21	20	1	3	Masselmai	female		0	0	2649	7.225		C	
22	21	0	2	Fynney, M	male	35	0	0	239865	26		S	
23	22	1	2	Beesley, M	male	34	0	0	248698	13	D56	S	
24	23	1	3	McGowan	female	15	0	0	330923	8.0292		Q	
25	24	1	1	Sloper, Mr	male	28	0	0	113788	35.5	A6	S	
26	25	0	3	Palsson, M	female	8	3	1	349909	21.075		S	
27	26	1	3	Asplund, M	female	38	1	5	347077	31.3875		S	
28	27	0	3	Emir, Mr. F	male		0	0	2631	7.225		C	
29	28	0	1	Fortune, M	male	19	3	2	19950	263	C23 C25 C	S	
30	29	1	3	O'Dwyer, M	female		0	0	330959	7.8792		Q	
31	30	0	3	Todoroff,	male		0	0	349216	7.8958		S	
32	31	0	1	Uruchurtu	male	40	0	0	PC 17601	27.7208		C	

titanic-train

After inserting the mean at missing value places in the csv sheet:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1		PassengerI	Survived	Pclass	Name	gender	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked	
2	0	1	0	3	Braund, M	male	22	1	0	A/5 21171	7.25		S	
3	1	2	1	1	Cumings, M	female	38	1	0	PC 17599	71.2833	C85	C	
4	2	3	1	3	Heikkinen,	female	26	0	0	STON/O2.	7.925		S	
5	3	4	1	1	Futrelle, M	female	35	1	0	113803	53.1	C123	S	
6	4	5	0	3	Allen, Mr. '	male	35	0	0	373450	8.05		S	
7	5	6	0	3	Moran, Mr	male	29.69912	0	0	330877	8.4583		Q	
8	6	7	0	1	McCarthy,	male	54	0	0	17463	51.8625	E46	S	
9	7	8	0	3	Palsson, M	male	2	3	1	349909	21.075		S	
10	8	9	1	3	Johnson, M	female	27	0	2	347742	11.1333		S	
11	9	10	1	2	Nasser, Mr	female	14	1	0	237736	30.0708		C	
12	10	11	1	3	Sandstrom	female	4	1	1	PP 9549	16.7	G6	S	
13	11	12	1	1	Bonnell, M	female	58	0	0	113783	26.55	C103	S	
14	12	13	0	3	Saunderco	male	20	0	0	A/5. 2151	8.05		S	
15	13	14	0	3	Andersson	male	39	1	5	347082	31.275		S	
16	14	15	0	3	Vestrom, M	female	14	0	0	350406	7.8542		S	
17	15	16	1	2	Hewlett, M	female	55	0	0	248706	16		S	
18	16	17	0	3	Rice, Mast	male	2	4	1	382652	29.125		Q	
19	17	18	1	2	Williams, M	male	29.69912	0	0	244373	13		S	
20	18	19	0	3	Vander Pla	female	31	1	0	345763	18		S	
21	19	20	1	3	Masselma	female	29.69912	0	0	2649	7.225		C	
22	20	21	0	2	Fynney, Mr	male	35	0	0	239865	26		S	
23	21	22	1	2	Beesley, M	male	34	0	0	248698	13	D56	S	
24	22	23	1	3	McGowan	female	15	0	0	330923	8.0292		Q	
25	23	24	1	1	Sloper, Mr	male	28	0	0	113788	35.5	A6	S	
26	24	25	0	3	Palsson, M	female	8	3	1	349909	21.075		S	
27	25	26	1	3	Asplund, M	female	38	1	5	347077	31.3875		S	
28	26	27	0	3	Emir, Mr. F	male	29.69912	0	0	2631	7.225		C	
29	27	28	0	1	Fortune, M	male	19	3	2	19950	263	C23 C25 C	S	
30	28	29	1	3	O'Dwyer, M	female	29.69912	0	0	330959	7.8792		Q	
31	29	30	0	3	Todoroff,	male	29.69912	0	0	349216	7.8958		S	
32	30	31	0	1	Uruchurtu	male	40	0	0	PC 17601	27.7208		C	

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