In [1]:

```
import pandas as pd
```

In [2]:

```
pd.__version__
```

Out[2]:

```
'2.1.4'
```

In [3]:

```
emp=pd.read_excel(r"D:\DS_NIT\Oct_24\EDA.xlsx")
```

In [4]:

```
emp
```

Out[4]:

	Name	Domain	Age	Location	Salary	Exp
0	Mike	Datascience#$	34 years	Mumbai	5^00#0	2+
1	Teddy^	Testing	45' yr	Bangalore	10%%000	<3
2	Uma#r	Dataanalyst^^#	NaN	NaN	1$5%000	4> yrs
3	Jane	Ana^^lytics	NaN	Hyderbad	2000^0	NaN
4	Uttam*	Statistics	67-yr	NaN	30000-	5+ year
5	Kim	NLP	55yr	Delhi	6000^$0	10+

In [5]:

```
emp.shape
```

Out[5]:

```
(6, 6)
```

In [6]:

```
emp.columns
```

Out[6]:

```
Index(['Name', 'Domain', 'Age', 'Location', 'Salary', 'Exp'], dtype='object')
```

In [7]:

```
emp.head()
```

Out[7]:

	Name	Domain	Age	Location	Salary	Exp
0	Mike	Datascience#$	34 years	Mumbai	5^00#0	2+
1	Teddy^	Testing	45' yr	Bangalore	10%%000	<3
2	Uma#r	Dataanalyst^^#	NaN	NaN	1$5%000	4> yrs
3	Jane	Ana^^lytics	NaN	Hyderbad	2000^0	NaN
4	Uttam*	Statistics	67-yr	NaN	30000-	5+ year

In [8]:

```
emp.tail()
```

Out[8]:

	Name	Domain	Age	Location	Salary	Exp
1	Teddy^	Testing	45' yr	Bangalore	10%%000	<3
2	Uma#r	Dataanalyst^^#	NaN	NaN	1$5%000	4> yrs
3	Jane	Ana^^lytics	NaN	Hyderbad	2000^0	NaN
4	Uttam*	Statistics	67-yr	NaN	30000-	5+ year
5	Kim	NLP	55yr	Delhi	6000^$0	10+

In [9]:

```
emp.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 6 entries, 0 to 5
Data columns (total 6 columns):
 #   Column    Non-Null Count  Dtype 
---  ------    --------------  ----- 
 0   Name      6 non-null      object
 1   Domain    6 non-null      object
 2   Age       4 non-null      object
 3   Location  4 non-null      object
 4   Salary    6 non-null      object
 5   Exp       5 non-null      object
dtypes: object(6)
memory usage: 420.0+ bytes
```

In [10]:

```
emp['Domain']
```

Out[10]:

```
0      Datascience#$
1            Testing
2     Dataanalyst^^#
3        Ana^^lytics
4         Statistics
5                NLP
Name: Domain, dtype: object
```

In [11]:

```
emp.isnull()
```

Out[11]:

	Name	Domain	Age	Location	Salary	Exp
0	False	False	False	False	False	False
1	False	False	False	False	False	False
2	False	False	True	True	False	False
3	False	False	True	False	False	True
4	False	False	False	True	False	False
5	False	False	False	False	False	False

In [12]:

```
emp.isnull().sum()
```

```
Out[12]: Name        0
         Domain      0
         Age         2
         Location    2
         Salary      0
         Exp         1
         dtype: int64
```

```
In [13]: emp['Name']
```

```
Out[13]: 0      Mike
         1    Teddy^
         2     Uma#r
         3      Jane
         4    Uttam*
         5       Kim
         Name: Name, dtype: object
```

```
In [14]: emp['Name']=emp['Name'].str.replace(r'\W','')
```

```
In [15]: emp['Name']
```

```
Out[15]: 0      Mike
         1    Teddy^
         2     Uma#r
         3      Jane
         4    Uttam*
         5       Kim
         Name: Name, dtype: object
```

```
In [16]: emp['Name']=emp['Name'].str.replace(r'\W','',regex=True)
```

```
In [17]: emp['Name']
```

```
Out[17]: 0     Mike
         1    Teddy
         2     Umar
         3     Jane
         4    Uttam
         5      Kim
         Name: Name, dtype: object
```

```
In [18]: emp.columns
```

```
Out[18]: Index(['Name', 'Domain', 'Age', 'Location', 'Salary', 'Exp'], dtype='object')
```

```
In [19]: emp.Domain
```

```
Out[19]: 0     Datascience#$
         1           Testing
         2    Dataanalyst^^#
         3       Ana^^lytics
         4        Statistics
         5               NLP
         Name: Domain, dtype: object
```

In [20]:

```
emp['Domain']=emp['Domain'].str.replace(r'\W','',regex=True)
```

In [21]:

```
emp['Domain']
```

Out[21]:

```
0    Datascience
1        Testing
2    Dataanalyst
3      Analytics
4     Statistics
5            NLP
Name: Domain, dtype: object
```

In [22]:

```
emp.columns
```

Out[22]:

```
Index(['Name', 'Domain', 'Age', 'Location', 'Salary', 'Exp'], dtype='object')
```

In [23]:

```
emp.Age
```

Out[23]:

```
0    34 years
1      45' yr
2         NaN
3         NaN
4       67-yr
5        55yr
Name: Age, dtype: object
```

In [24]:

```
emp['Age']=emp['Age'].str.extract(r'(\d+)')
```

In [25]:

```
emp['Age']
```

Out[25]:

```
0     34
1     45
2    NaN
3    NaN
4     67
5     55
Name: Age, dtype: object
```

In [26]:

```
emp.columns
```

Out[26]:

```
Index(['Name', 'Domain', 'Age', 'Location', 'Salary', 'Exp'], dtype='object')
```

In [27]:

```
emp.Location
```

Out[27]:

```
0       Mumbai
1    Bangalore
2          NaN
3     Hyderbad
4          NaN
5        Delhi
Name: Location, dtype: object
```

In [28]:

```
emp.Salary
```

Out[28]:

```
0     5^00#0
1    10%%000
2    1$5%000
3     2000^0
4     30000-
5    6000^$0
Name: Salary, dtype: object
```

In [29]:

```
emp['Salary']=emp['Salary'].str.replace(r'\W','',regex=True)
```

In [30]:

```
emp['Salary']
```

Out[30]:

```
0     5000
1    10000
2    15000
3    20000
4    30000
5    60000
Name: Salary, dtype: object
```

In [31]:

```
emp.Exp
```

Out[31]:

```
0         2+
1         <3
2     4> yrs
3        NaN
4    5+ year
5        10+
Name: Exp, dtype: object
```

In [32]:

```
emp['Exp']=emp['Exp'].str.extract(r'(\d+)')
```

In [33]:

```
emp['Exp']
```

Out[33]:

```
0      2
1      3
2      4
3    NaN
4      5
5     10
Name: Exp, dtype: object
```

In [34]:

```
emp.head()
```

Out[34]:

	Name	Domain	Age	Location	Salary	Exp
0	Mike	Datascience	34	Mumbai	5000	2
1	Teddy	Testing	45	Bangalore	10000	3
2	Umar	Dataanalyst	NaN	NaN	15000	4
3	Jane	Analytics	NaN	Hyderbad	20000	NaN
4	Uttam	Statistics	67	NaN	30000	5

In [35]:
```
clean_data=emp.copy()
```

In [36]:
```
clean_data
```

Out[36]:

	Name	Domain	Age	Location	Salary	Exp
0	Mike	Datascience	34	Mumbai	5000	2
1	Teddy	Testing	45	Bangalore	10000	3
2	Umar	Dataanalyst	NaN	NaN	15000	4
3	Jane	Analytics	NaN	Hyderbad	20000	NaN
4	Uttam	Statistics	67	NaN	30000	5
5	Kim	NLP	55	Delhi	60000	10

In [37]:
```
import numpy as np
```

In [38]:
```
clean_data['Age']=clean_data['Age'].fillna(np.mean(pd.to_numeric(clean_data['Age']))
```

In [39]:
```
clean_data['Age']
```

Out[39]:
```
0       34
1       45
2    50.25
3    50.25
4       67
5       55
Name: Age, dtype: object
```

In [40]:
```
clean_data['Location']
```

Out[40]:
```
0       Mumbai
1    Bangalore
2          NaN
3     Hyderbad
4          NaN
5        Delhi
Name: Location, dtype: object
```

In [41]:
```
clean_data['Location']=clean_data['Location'].fillna(clean_data['Location'].mode()[
```

In [42]:
```
clean_data['Location']
```

Out[42]:
```
0       Mumbai
1    Bangalore
2    Bangalore
3     Hyderbad
4    Bangalore
5        Delhi
Name: Location, dtype: object
```

In [43]:

```
clean_data
```

Out[43]:

	Name	Domain	Age	Location	Salary	Exp
0	Mike	Datascience	34	Mumbai	5000	2
1	Teddy	Testing	45	Bangalore	10000	3
2	Umar	Dataanalyst	50.25	Bangalore	15000	4
3	Jane	Analytics	50.25	Hyderbad	20000	NaN
4	Uttam	Statistics	67	Bangalore	30000	5
5	Kim	NLP	55	Delhi	60000	10

In [44]:

```
clean_data['Exp']=clean_data['Exp'].fillna(np.mean(pd.to_numeric(clean_data['Exp'])
```

In [45]:

```
clean_data['Exp']
```

Out[45]:

```
0      2
1      3
2      4
3    4.8
4      5
5     10
Name: Exp, dtype: object
```

In [46]:

```
clean_data
```

Out[46]:

	Name	Domain	Age	Location	Salary	Exp
0	Mike	Datascience	34	Mumbai	5000	2
1	Teddy	Testing	45	Bangalore	10000	3
2	Umar	Dataanalyst	50.25	Bangalore	15000	4
3	Jane	Analytics	50.25	Hyderbad	20000	4.8
4	Uttam	Statistics	67	Bangalore	30000	5
5	Kim	NLP	55	Delhi	60000	10

In [47]:

```
clean_data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 6 entries, 0 to 5
Data columns (total 6 columns):
 #   Column    Non-Null Count  Dtype 
---  ------    --------------  ----- 
 0   Name      6 non-null      object
 1   Domain    6 non-null      object
 2   Age       6 non-null      object
 3   Location  6 non-null      object
 4   Salary    6 non-null      object
 5   Exp       6 non-null      object
dtypes: object(6)
memory usage: 420.0+ bytes
```

In [48]:

```
clean_data['Age']=clean_data['Age'].astype(int)
clean_data['Salary']=clean_data['Salary'].astype(int)
clean_data['Exp']=clean_data['Exp'].astype(int)
```

In [49]:

```
clean_data['Name']=clean_data['Name'].astype('category')
clean_data['Domain']=clean_data['Domain'].astype('category')
clean_data['Location']=clean_data['Location'].astype('category')
```

In [50]:

```
clean_data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 6 entries, 0 to 5
Data columns (total 6 columns):
 #   Column    Non-Null Count  Dtype   
---  ------    --------------  -----   
 0   Name      6 non-null      category
 1   Domain    6 non-null      category
 2   Age       6 non-null      int32   
 3   Location  6 non-null      category
 4   Salary    6 non-null      int32   
 5   Exp       6 non-null      int32   
dtypes: category(3), int32(3)
memory usage: 866.0 bytes
```

In [51]:

```
clean_data
```

Out[51]:

	Name	Domain	Age	Location	Salary	Exp
0	Mike	Datascience	34	Mumbai	5000	2
1	Teddy	Testing	45	Bangalore	10000	3
2	Umar	Dataanalyst	50	Bangalore	15000	4
3	Jane	Analytics	50	Hyderbad	20000	4
4	Uttam	Statistics	67	Bangalore	30000	5
5	Kim	NLP	55	Delhi	60000	10

In [52]:

```
clean_data.to_csv('clean_datapr.csv')
```

In [53]:

```
import os
os.getcwd()
```

Out[53]:

```
"C:\\Users\\evenk\\OneDrive\\Desktop\\DS_NIT\\Oct'24"
```

In [54]:

```
clean_data
```

Out[54]:

	Name	Domain	Age	Location	Salary	Exp
0	Mike	Datascience	34	Mumbai	5000	2
1	Teddy	Testing	45	Bangalore	10000	3
2	Umar	Dataanalyst	50	Bangalore	15000	4
3	Jane	Analytics	50	Hyderbad	20000	4
4	Uttam	Statistics	67	Bangalore	30000	5
5	Kim	NLP	55	Delhi	60000	10

LETS APPLY EDA TECHNIQUES

In [55]:

```
import matplotlib.pyplot as plt
import seaborn as sns
```

In [56]:

```
import warnings
warnings.filterwarnings('ignore')
```

In [57]:

```
clean_data
```

Out[57]:

	Name	Domain	Age	Location	Salary	Exp
0	Mike	Datascience	34	Mumbai	5000	2
1	Teddy	Testing	45	Bangalore	10000	3
2	Umar	Dataanalyst	50	Bangalore	15000	4
3	Jane	Analytics	50	Hyderbad	20000	4
4	Uttam	Statistics	67	Bangalore	30000	5
5	Kim	NLP	55	Delhi	60000	10

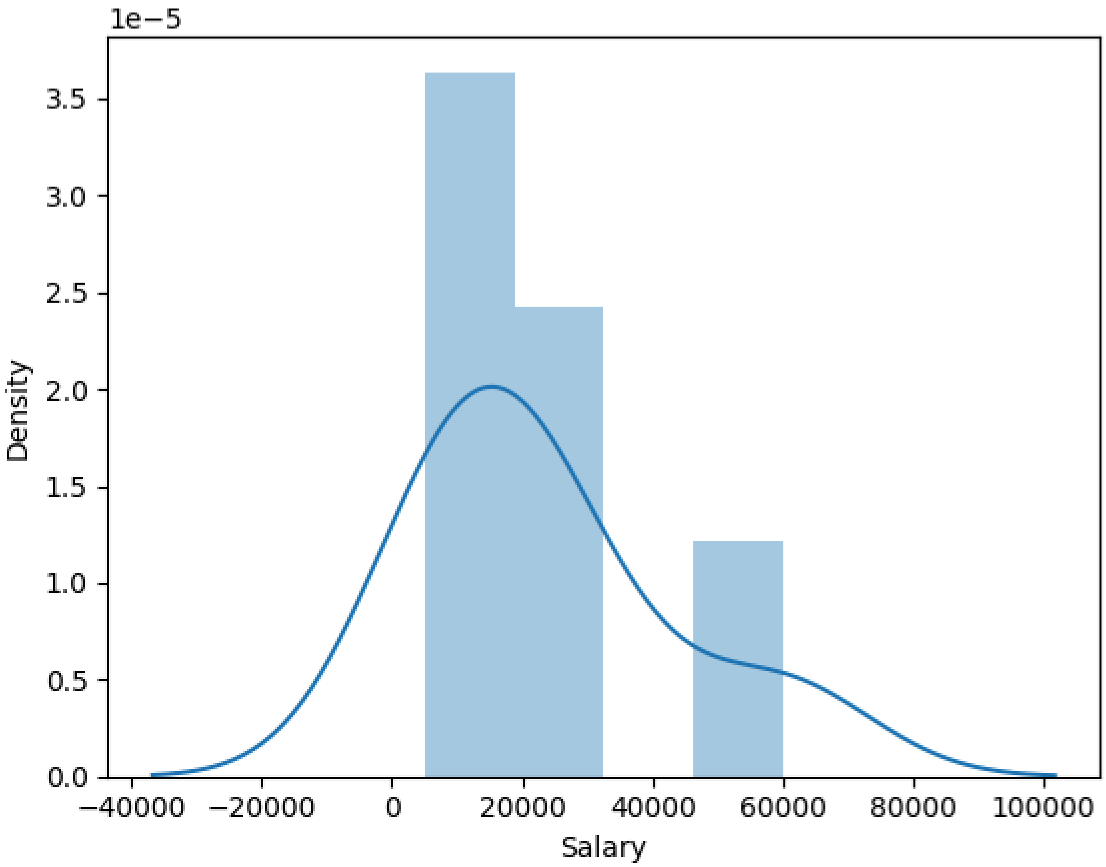
In [58]:

```
clean_data['Salary']
```

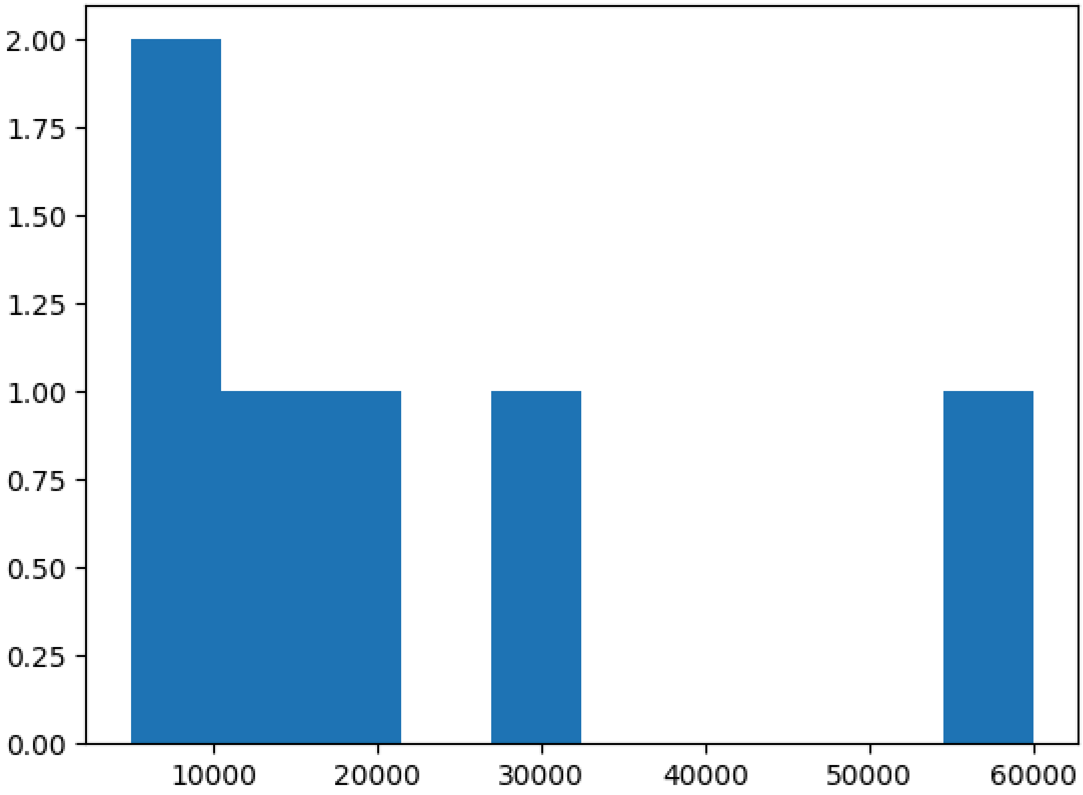
```
Out[58]: 0     5000
         1    10000
         2    15000
         3    20000
         4    30000
         5    60000
         Name: Salary, dtype: int32
```

Visualization

```
In [59]: #univariate
         vis1=sns.distplot(clean_data['Salary'])
```

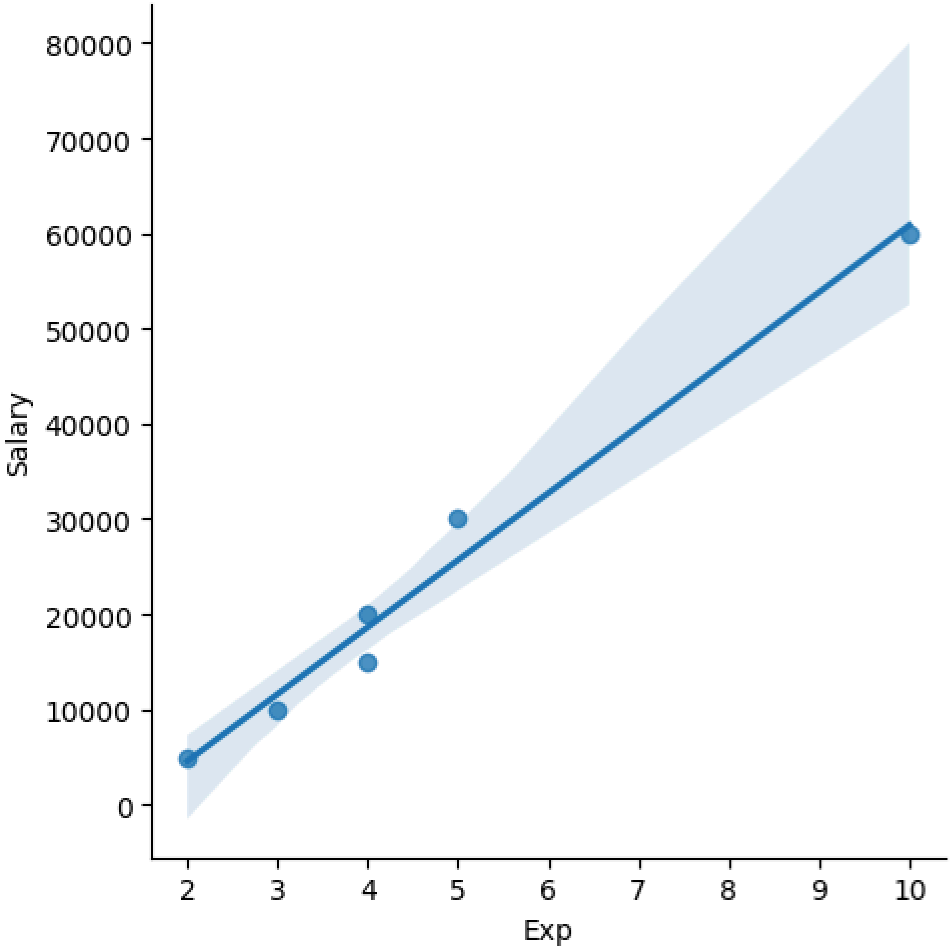


```
In [60]: #outlier
         vis2=plt.hist(clean_data['Salary'])
```

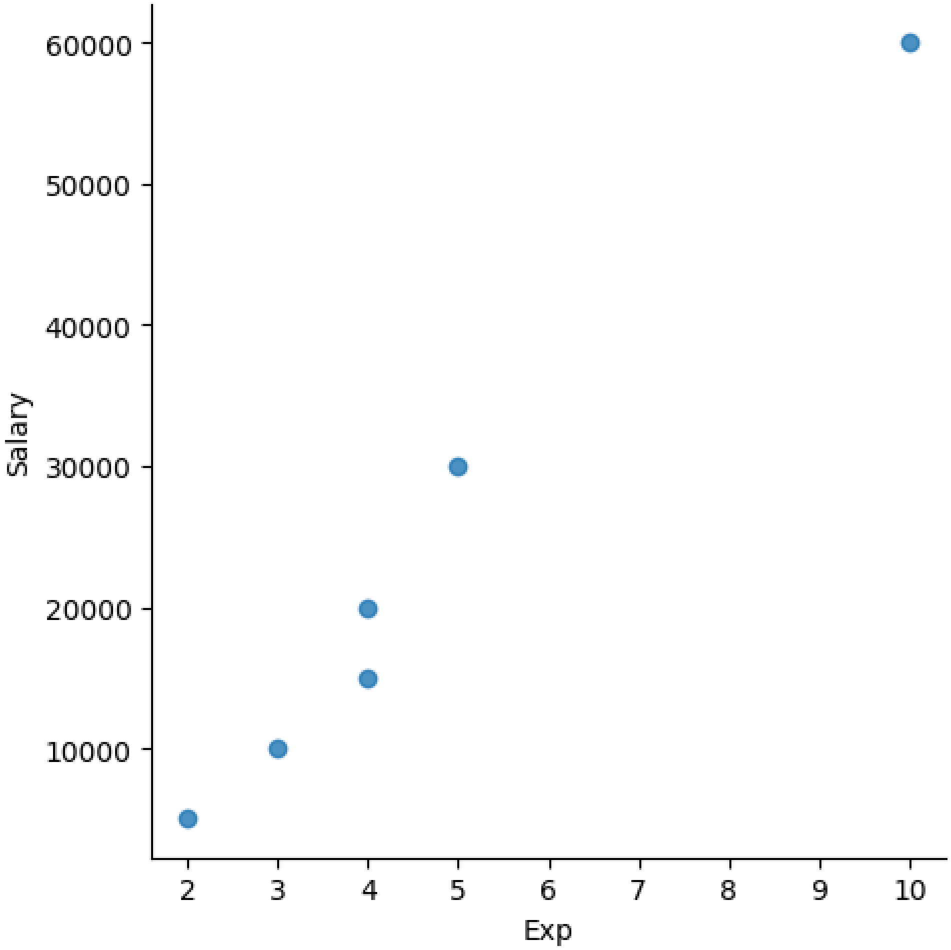


In [61]:

```
#bivariate
vis3=sns.lmplot(data=clean_data,x='Exp',y='Salary')
```



```
In [62]: vis3=sns.lmplot(data=clean_data,x='Exp',y='Salary',fit_reg=False)
```



In [63]:

```
clean_data
```

Out[63]:

	Name	Domain	Age	Location	Salary	Exp
0	Mike	Datascience	34	Mumbai	5000	2
1	Teddy	Testing	45	Bangalore	10000	3
2	Umar	Dataanalyst	50	Bangalore	15000	4
3	Jane	Analytics	50	Hyderbad	20000	4
4	Uttam	Statistics	67	Bangalore	30000	5
5	Kim	NLP	55	Delhi	60000	10

In [64]:

```
clean_data[:]
```

Out[64]:

	Name	Domain	Age	Location	Salary	Exp
0	Mike	Datascience	34	Mumbai	5000	2
1	Teddy	Testing	45	Bangalore	10000	3
2	Umar	Dataanalyst	50	Bangalore	15000	4
3	Jane	Analytics	50	Hyderbad	20000	4
4	Uttam	Statistics	67	Bangalore	30000	5
5	Kim	NLP	55	Delhi	60000	10

In [65]:

```
clean_data[1:6:2]
```

Out[65]:

	Name	Domain	Age	Location	Salary	Exp
1	Teddy	Testing	45	Bangalore	10000	3
3	Jane	Analytics	50	Hyderbad	20000	4
5	Kim	NLP	55	Delhi	60000	10

In [66]:

```
clean_data[2:6]
```

Out[66]:

	Name	Domain	Age	Location	Salary	Exp
2	Umar	Dataanalyst	50	Bangalore	15000	4
3	Jane	Analytics	50	Hyderbad	20000	4
4	Uttam	Statistics	67	Bangalore	30000	5
5	Kim	NLP	55	Delhi	60000	10

In [67]:

```
clean_data[:]
```

Out[67]:

	Name	Domain	Age	Location	Salary	Exp
0	Mike	Datascience	34	Mumbai	5000	2
1	Teddy	Testing	45	Bangalore	10000	3
2	Umar	Dataanalyst	50	Bangalore	15000	4
3	Jane	Analytics	50	Hyderbad	20000	4
4	Uttam	Statistics	67	Bangalore	30000	5
5	Kim	NLP	55	Delhi	60000	10

In [68]:

```
clean_data[::-1]
```

Out[68]:

	Name	Domain	Age	Location	Salary	Exp
5	Kim	NLP	55	Delhi	60000	10
4	Uttam	Statistics	67	Bangalore	30000	5
3	Jane	Analytics	50	Hyderbad	20000	4
2	Umar	Dataanalyst	50	Bangalore	15000	4
1	Teddy	Testing	45	Bangalore	10000	3
0	Mike	Datascience	34	Mumbai	5000	2

In [69]:

```
clean_data.columns
```

Out[69]:

```
Index(['Name', 'Domain', 'Age', 'Location', 'Salary', 'Exp'], dtype='object')
```

In [70]:

```
#variable identification(independent variable)
x_iv=clean_data[['Name', 'Domain', 'Age', 'Location', 'Exp']]
```

In [71]:

```
x_iv
```

Out[71]:

	Name	Domain	Age	Location	Exp
0	Mike	Datascience	34	Mumbai	2
1	Teddy	Testing	45	Bangalore	3
2	Umar	Dataanalyst	50	Bangalore	4
3	Jane	Analytics	50	Hyderbad	4
4	Uttam	Statistics	67	Bangalore	5
5	Kim	NLP	55	Delhi	10

In [72]:

```
#Variable identification(Dependent variable)
y_iv=clean_data[['Salary']]
```

In [73]:

```
y_iv
```

Out[73]:

	Salary
0	5000
1	10000
2	15000
3	20000
4	30000
5	60000

In [74]:

```
clean_data
```

Out[74]:

	Name	Domain	Age	Location	Salary	Exp
0	Mike	Datascience	34	Mumbai	5000	2
1	Teddy	Testing	45	Bangalore	10000	3
2	Umar	Dataanalyst	50	Bangalore	15000	4
3	Jane	Analytics	50	Hyderbad	20000	4
4	Uttam	Statistics	67	Bangalore	30000	5
5	Kim	NLP	55	Delhi	60000	10

In [75]:

```
x_iv
```

Out[75]:

	Name	Domain	Age	Location	Exp
0	Mike	Datascience	34	Mumbai	2
1	Teddy	Testing	45	Bangalore	3
2	Umar	Dataanalyst	50	Bangalore	4
3	Jane	Analytics	50	Hyderbad	4
4	Uttam	Statistics	67	Bangalore	5
5	Kim	NLP	55	Delhi	10

In [76]:

```
y_iv
```

Out[76]:

	Salary
0	5000
1	10000
2	15000
3	20000
4	30000
5	60000

In [77]:

```
emp
```

Out[77]:

	Name	Domain	Age	Location	Salary	Exp
0	Mike	Datascience	34	Mumbai	5000	2
1	Teddy	Testing	45	Bangalore	10000	3
2	Umar	Dataanalyst	NaN	NaN	15000	4
3	Jane	Analytics	NaN	Hyderbad	20000	NaN
4	Uttam	Statistics	67	NaN	30000	5
5	Kim	NLP	55	Delhi	60000	10

In [78]:

```
clean_data
```

Out[78]:

	Name	Domain	Age	Location	Salary	Exp
0	Mike	Datascience	34	Mumbai	5000	2
1	Teddy	Testing	45	Bangalore	10000	3
2	Umar	Dataanalyst	50	Bangalore	15000	4
3	Jane	Analytics	50	Hyderbad	20000	4
4	Uttam	Statistics	67	Bangalore	30000	5
5	Kim	NLP	55	Delhi	60000	10

In [83]:

```
imputation=pd.get_dummies(clean_data)
```

In [84]:

```
imputation
```

Out[84]:

	Age	Salary	Exp	Name_Jane	Name_Kim	Name_Mike	Name_Teddy	Name_Umar	Nan
0	34	5000	2	False	False	True	False	False	
1	45	10000	3	False	False	False	True	False	
2	50	15000	4	False	False	False	False	True	
3	50	20000	4	True	False	False	False	False	
4	67	30000	5	False	False	False	False	False	
5	55	60000	10	False	True	False	False	False	

In [85]:

```
imputation=pd.get_dummies(clean_data,dtype=int)
```

In [86]:

```
imputation
```

Out[86]:

	Age	Salary	Exp	Name_Jane	Name_Kim	Name_Mike	Name_Teddy	Name_Umar	Nan
0	34	5000	2	0	0	1	0	0	
1	45	10000	3	0	0	0	1	0	
2	50	15000	4	0	0	0	0	1	
3	50	20000	4	1	0	0	0	0	
4	67	30000	5	0	0	0	0	0	
5	55	60000	10	0	1	0	0	0	

In [ ]: