In [69]:
```
import pandas as pd
import numpy as np
```

In [70]:
```
Rawdata= pd.read_excel('Rawdata.xlsx')
Rawdata
```

Out[70]:

	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 [71]:
```
emp = Rawdata.copy()
emp
```

Out[71]:

	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 [72]:
```
id(emp)
```

Out[72]:
```
2150525672912
```

In [73]:
```
emp.columns
```

Out[73]:
```
Index(['Name', 'Domain', 'Age', 'Location', 'Salary', 'Exp'], dtype='obje
ct')
```

In [74]:
```
emp.shape
```

Out[74]:
```
(6, 6)
```

In [75]:
```
emp.head(7)
```

Out[75]:

	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 [76]:
```
emp.tail(7)
```

Out[76]:

	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 [77]:
```
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 [78]:
```
emp.isnull()
```

Out[78]:

	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 [79]:

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

Out[79]:

```
Name        0
Domain      0
Age         2
Location    2
Salary      0
Exp         1
dtype: int64
```

Data cleaning

In [80]:

```
emp
```

Out[80]:

	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 [81]:

```
emp['Name']
```

Out[81]:

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

In [82]:

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

Out[82]:

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

In [83]:

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

Out[83]:

	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 [84]:

```
clean_data = emp.copy()
clean_data
```

Out[84]:

	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

Till now we have raw data we use

EDA

In [85]:

```
clean_data.isnull().sum()
```

Out[85]:

```
Name        0
Domain      0
Age         2
Location    2
Salary      0
Exp         1
dtype: int64
```

In [86]:

```
clean_data['Age']
```

Out[86]:

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

In [87]:

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

Out[87]:

	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	NaN	15000	4
3	Jane	Analytics	50.25	Hyderbad	20000	4.8
4	Uttam	Statistics	67	NaN	30000	5
5	Kim	NLP	55	Delhi	60000	10

In [88]:

```
clean_data['Location'] = clean_data['Location'].fillna(clean_data['Locatior
clean_data['Location']
```

Out[88]:

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

In [89]:

```
clean_data
```

Out[89]:

	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 [90]:

```
cleaned_emp = clean_data.copy()
cleaned_emp
```

Out[90]:

	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 [91]:

```
cleaned_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       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 [92]:

```
cleaned_emp.describe()
```

Out[92]:

	Name	Domain	Age	Location	Salary	Exp
count	6	6	6.00	6	6	6
unique	6	6	5.00	4	6	6
top	Mike	Datascience	50.25	Bangalore	5000	2
freq	1	1	2.00	3	1	1

In [93]:

```
cleaned_emp['Age'] = cleaned_emp['Age'].astype(int)
cleaned_emp['Salary'] = cleaned_emp['Salary'].astype(int)
cleaned_emp['Exp'] = cleaned_emp['Exp'].astype(int)
cleaned_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       6 non-null      int32 
 3   Location  6 non-null      object
 4   Salary    6 non-null      int32 
 5   Exp       6 non-null      int32 
dtypes: int32(3), object(3)
memory usage: 348.0+ bytes
```

In [94]:

```
cleaned_emp.describe()
```

Out[94]:

	Age	Salary	Exp
count	6.000000	6.000000	6.000000
mean	50.166667	23333.333333	4.666667
std	10.907184	19916.492328	2.804758
min	34.000000	5000.000000	2.000000
25%	46.250000	11250.000000	3.250000
50%	50.000000	17500.000000	4.000000
75%	53.750000	27500.000000	4.750000
max	67.000000	60000.000000	10.000000

In [95]:

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

Out[95]:

	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 [96]:

```
cleaned_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      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 [97]:

```
cleaned_emp.to_excel('cleaned_emp.xlsx')
```

In [98]:

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

Out[98]:

```
'C:\\Users\\Sandeep\\OneDrive\\Desktop\\Coching\\Institute\\Projects'
```

EDA Techniques

In [99]:

```
import matplotlib.pyplot as plt
import seaborn as sns
import warnings
warnings.filterwarnings('ignore')
```

In [100]:

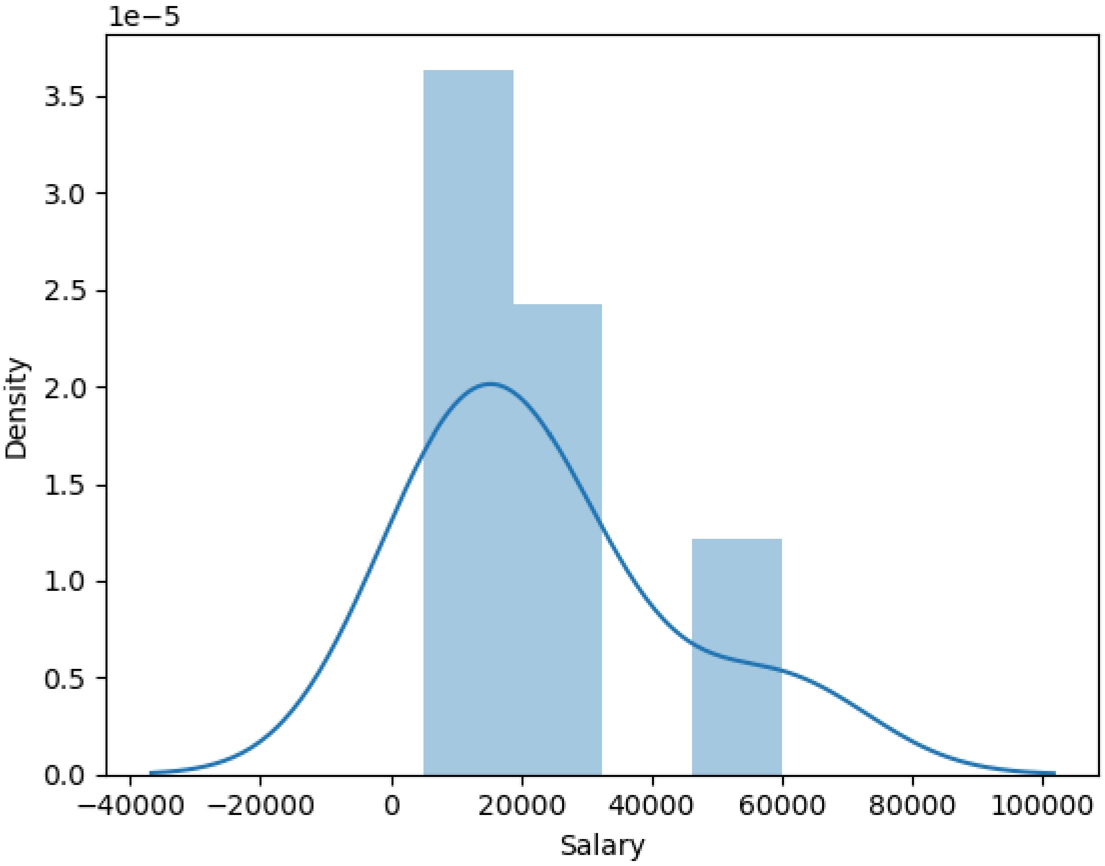
```
cleaned_emp['Salary']
```

Out[100]:

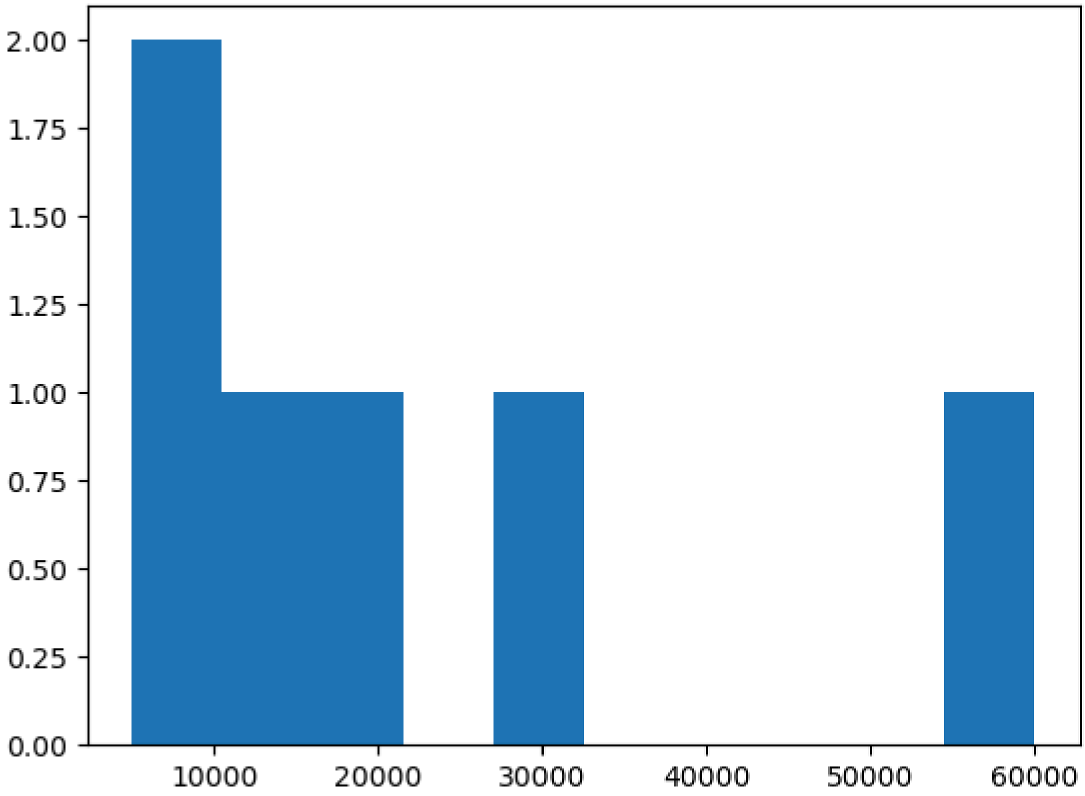
```
0     5000
1    10000
2    15000
3    20000
4    30000
5    60000
Name: Salary, dtype: int32
```

In [101]:

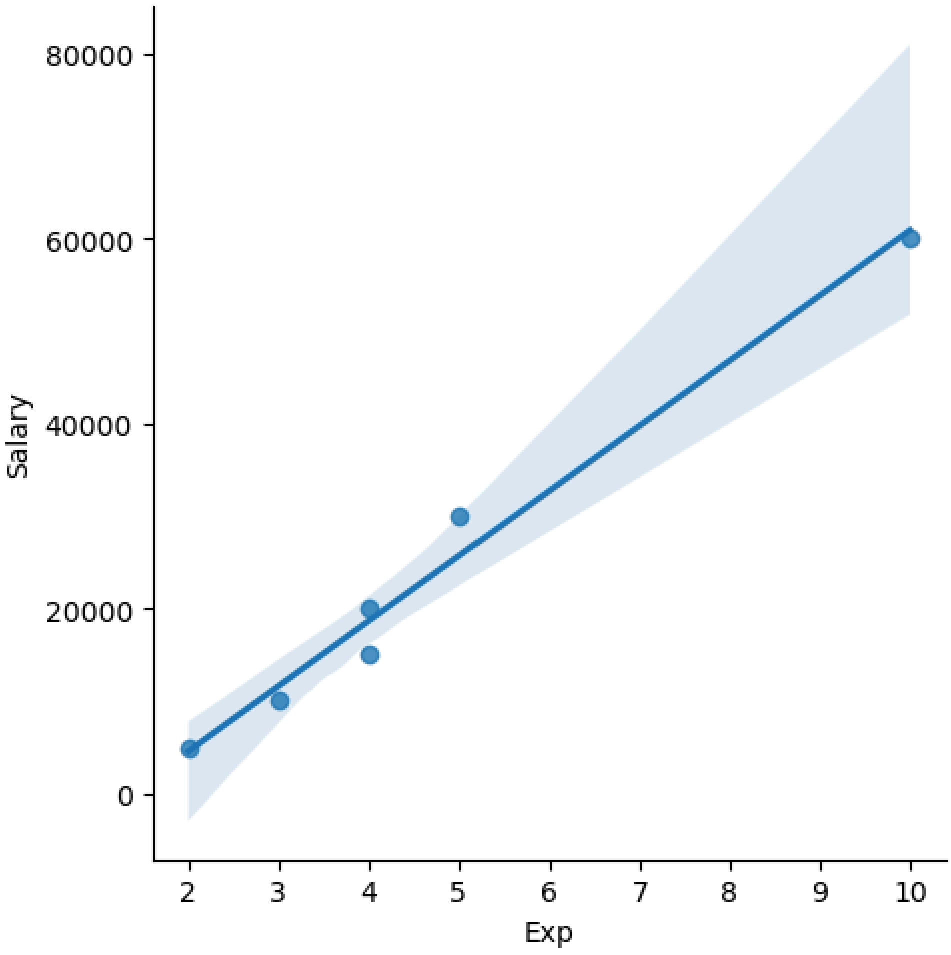
```
vis1=sns.distplot(cleaned_emp['Salary'])
```



```
In [102]: vis2=plt.hist(cleaned_emp['Salary'])
```

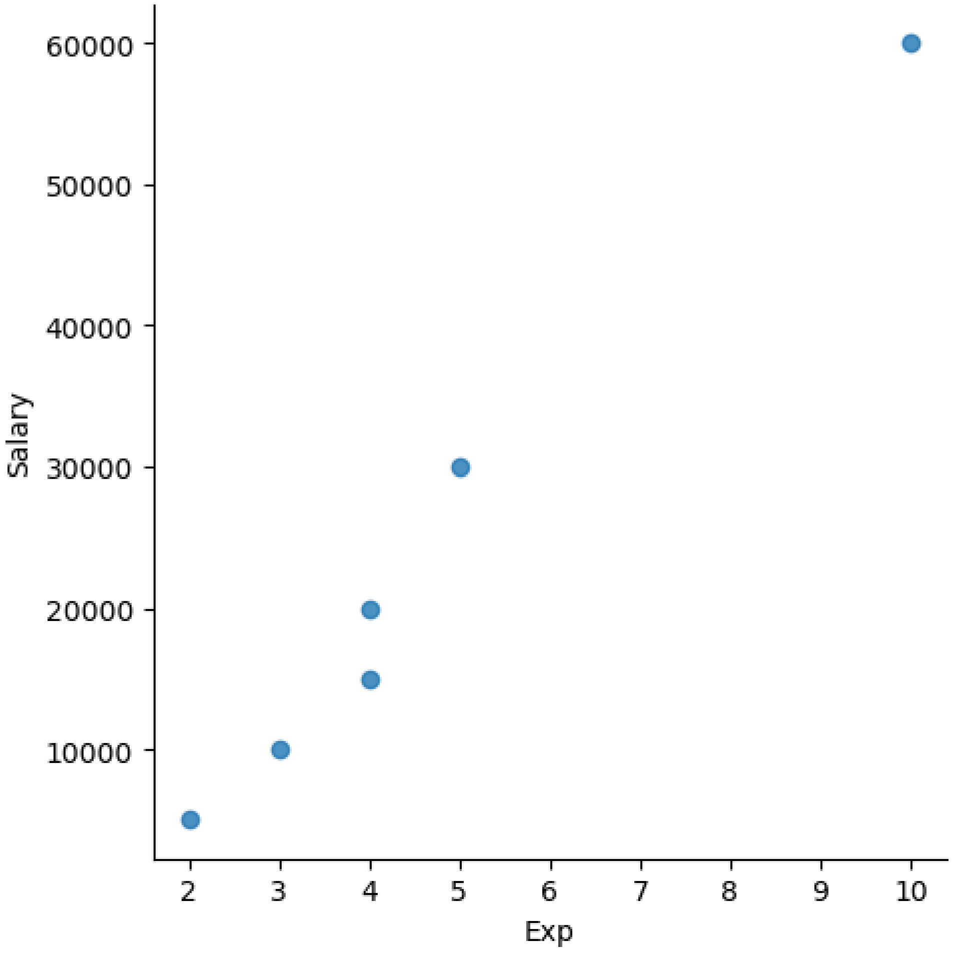


```
In [103]: vis3=sns.lmplot(data=cleaned_emp, x ='Exp', y='Salary')
```



In [104]:

```
vis4=sns.lmplot(data=cleaned_emp,x='Exp',y='Salary',fit_reg=False)
```



In [105]:

```
cleaned_emp[:]
```

Out[105]:

	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 [106]:

```
cleaned_emp[0:6:2]
```

Out[106]:

	Name	Domain	Age	Location	Salary	Exp
0	Mike	Datascience	34	Mumbai	5000	2
2	Umar	Dataanalyst	50	Bangalore	15000	4
4	Uttam	Statistics	67	Bangalore	30000	5

In [107]:

```
cleaned_emp[::-1]
```

Out[107]:

	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 [108]:

```
cleaned_emp.columns
```

Out[108]:

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

In [109]:

```
x_iv = cleaned_emp[['Name', 'Domain', 'Age', 'Location', 'Salary', 'Exp']]
x_iv
```

Out[109]:

	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 [110]:

```
y_dv=cleaned_emp[['Salary']]
y_dv
```

Out[110]:

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

In [111]:

```
Rawdata
```

Out[111]:

	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 [112]:

```
emp
```

Out[112]:

	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 [113]:

```
clean_data
```

Out[113]:

	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 [114]:

```
cleaned_emp
```

Out[114]:

	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 [115]:
```
x_iv
```

Out[115]:

	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 [116]:
```
imputation = pd.get_dummies(cleaned_emp)
imputation
```

Out[116]:

	Age	Salary	Exp	Name_Jane	Name_Kim	Name_Mike	Name_Teddy	Name_Umar	Name_
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 [118]:
```
imputation1 = pd.get_dummies(cleaned_emp).sum()
imputation1
```

Out[118]:
```
Age                       301
Salary                 140000
Exp                        28
Name_Jane                   1
Name_Kim                    1
Name_Mike                   1
Name_Teddy                  1
Name_Umar                   1
Name_Uttam                  1
Domain_Analytics            1
Domain_Dataanalyst          1
Domain_Datascience          1
Domain_NLP                  1
Domain_Statistics           1
Domain_Testing              1
Location_Bangalore          3
Location_Delhi              1
Location_Hyderbad           1
Location_Mumbai             1
dtype: int64
```

In [ ]:

```
In [ ]:
```

```
In [ ]:
```

```
In [ ]:
```

```
In [ ]:
```

```
In [ ]:
```

```
In [ ]:
```

```
In [ ]:
```

```
In [ ]:
```

```
In [ ]:
```

```
In [ ]:
```

```
In [ ]:
```