In [1]:
```
import numpy as np
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
from sklearn import preprocessing,svm
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LinearRegression
```

In [2]:
```
df=pd.read_csv(r"C:\Users\jangidi veena\Downloads\bottle.csv (1).zip")
df
```

```
C:\Users\jangidi veena\AppData\Local\Temp\ipykernel_12280\504198146.py:1: Dty
peWarning: Columns (47,73) have mixed types. Specify dtype option on import o
r set low_memory=False.
  df=pd.read_csv(r"C:\Users\jangidi veena\Downloads\bottle.csv (1).zip")
```

Out[2]:

	Cst_Cnt	Btl_Cnt	Sta_ID	Depth_ID	Depthm	T_degC	Salnty	O2ml_L	STheta	O2S
0	1	1	054.0 056.0	19-4903CR-HY-060-0930-05400560-0000A-3	0	10.500	33.4400	NaN	25.64900	Na
1	1	2	054.0 056.0	19-4903CR-HY-060-0930-05400560-0008A-3	8	10.460	33.4400	NaN	25.65600	Na
2	1	3	054.0 056.0	19-4903CR-HY-060-0930-05400560-0010A-7	10	10.460	33.4370	NaN	25.65400	Na
3	1	4	054.0 056.0	19-4903CR-HY-060-0930-05400560-0019A-3	19	10.450	33.4200	NaN	25.64300	Na
4	1	5	054.0 056.0	19-4903CR-HY-060-0930-05400560-0020A-7	20	10.450	33.4210	NaN	25.64300	Na
...	...	...	...	...	...	...	...	...	...	
864858	34404	864859	093.4 026.4	20-1611SR-MX-310-2239-09340264-0000A-7	0	18.744	33.4083	5.805	23.87055	108.
864859	34404	864860	093.4 026.4	20-1611SR-MX-310-2239-09340264-0002A-3	2	18.744	33.4083	5.805	23.87072	108.
864860	34404	864861	093.4 026.4	20-1611SR-MX-310-2239-09340264-0005A-3	5	18.692	33.4150	5.796	23.88911	108.
864861	34404	864862	093.4 026.4	20-1611SR-MX-310-2239-09340264-0010A-3	10	18.161	33.4062	5.816	24.01426	107.

	Cst_Cnt	Btl_Cnt	Sta_ID	Depth_ID	Depthm	T_degC	Salnty	O2ml_L	STheta	O2S
864862	34404	864863	093.4 026.4	20-1611SR-MX-310-2239-09340264-0015A-3	15	17.533	33.3880	5.774	24.15297	105.

864863 rows × 74 columns

In [7]:
```
df=df[['Salnty','T_degC']]
df.columns=['Sal','Temp']
```

```
---------------------------------------------------------------------------
KeyError                                  Traceback (most recent call last)
Cell In[7], line 1
----> 1 df=df[['Salnty','T_degC']]
      2 df.columns=['Sal','Temp']

File ~\AppData\Local\Programs\Python\Python311\Lib\site-packages\pandas\core
\frame.py:3767, in DataFrame.__getitem__(self, key)
   3765     if is_iterator(key):
   3766         key = list(key)
-> 3767     indexer = self.columns._get_indexer_strict(key, "columns")[1]
   3769 # take() does not accept boolean indexers
   3770 if getattr(indexer, "dtype", None) == bool:

File ~\AppData\Local\Programs\Python\Python311\Lib\site-packages\pandas\core
\indexes\base.py:5876, in Index._get_indexer_strict(self, key, axis_name)
   5873 else:
   5874     keyarr, indexer, new_indexer = self._reindex_non_unique(keyarr)
-> 5876 self._raise_if_missing(keyarr, indexer, axis_name)
   5878 keyarr = self.take(indexer)
   5879 if isinstance(key, Index):
   5880     # GH 42790 - Preserve name from an Index

File ~\AppData\Local\Programs\Python\Python311\Lib\site-packages\pandas\core
\indexes\base.py:5935, in Index._raise_if_missing(self, key, indexer, axis_na
me)
   5933     if use_interval_msg:
   5934         key = list(key)
-> 5935     raise KeyError(f"None of [{key}] are in the [{axis_name}]")
   5937 not_found = list(ensure_index(key)[missing_mask.nonzero()[0]].unique
())
   5938 raise KeyError(f"{not_found} not in index")

KeyError: "None of [Index(['Salnty', 'T_degC'], dtype='object')] are in the
[columns]"
```

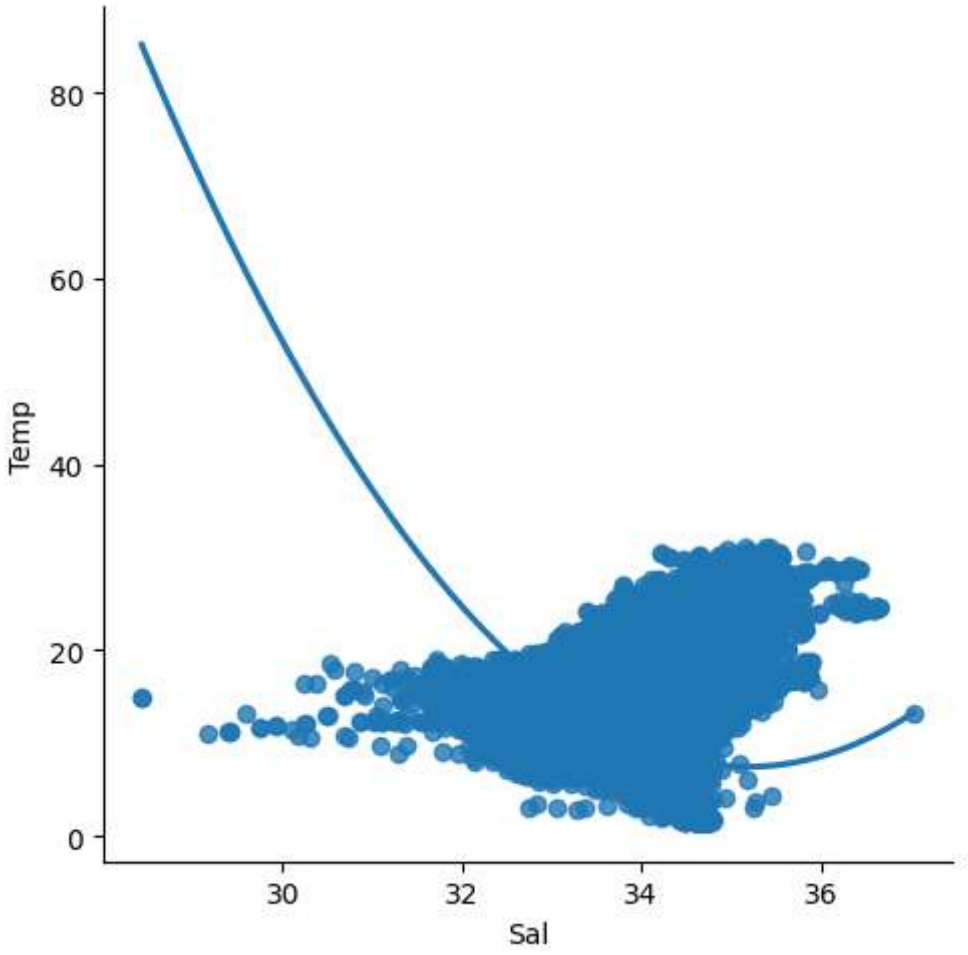
In [6]:
```
df.head(10)
```

Out[6]:

	Sal	Temp
0	33.440	10.50
1	33.440	10.46
2	33.437	10.46
3	33.420	10.45
4	33.421	10.45
5	33.431	10.45
6	33.440	10.45
7	33.424	10.24
8	33.420	10.06
9	33.494	9.86

In [8]:
```
sns.lmplot(x="Sal",y="Temp",data=df,order=2,ci=None)
```

Out[8]:
```
<seaborn.axisgrid.FacetGrid at 0x214f1e67d50>
```



In [9]:
```
df.describe()
```

Out[9]:

	Sal	Temp
count	817509.000000	853900.000000
mean	33.840350	10.799677
std	0.461843	4.243825
min	28.431000	1.440000
25%	33.488000	7.680000
50%	33.863000	10.060000
75%	34.196900	13.880000
max	37.034000	31.140000

In [10]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 864863 entries, 0 to 864862
Data columns (total 2 columns):
 #   Column  Non-Null Count   Dtype  
---  ------  --------------   -----  
 0   Sal     817509 non-null  float64
 1   Temp    853900 non-null  float64
dtypes: float64(2)
memory usage: 13.2 MB
```

In [11]:
```
df.fillna(method='ffill',inplace=True)
```

```
C:\Users\jangidi veena\AppData\Local\Temp\ipykernel_12280\4116506308.py:1: Se
ttingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/s
table/user_guide/indexing.html#returning-a-view-versus-a-copy (https://panda
s.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-ver
sus-a-copy)
  df.fillna(method='ffill',inplace=True)
```

In [13]:
```
x=np.array(df['Sal']).reshape(-1,1)
y=np.array(df['Temp']).reshape(-1,1)
df.dropna(inplace=True)
x=np.array(df['Sal']).reshape(-1,1)
y=np.array(df['Temp']).reshape(-1,1)
df.dropna(inplace=True)
x_train,x_test,y_train,y_test= train_test_split(x,y,test_size=0.25)
regr=LinearRegression()
regr.fit(x_train,y_train)
print(regr.score(x_test,y_test))
```

```
0.20441496419187943

C:\Users\jangidi veena\AppData\Local\Temp\ipykernel_12280\1078319267.py:3: Se
ttingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/s
table/user_guide/indexing.html#returning-a-view-versus-a-copy (https://panda
s.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-ver
sus-a-copy)
  df.dropna(inplace=True)
C:\Users\jangidi veena\AppData\Local\Temp\ipykernel_12280\1078319267.py:6: Se
ttingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/s
table/user_guide/indexing.html#returning-a-view-versus-a-copy (https://panda
s.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-ver
sus-a-copy)
  df.dropna(inplace=True)
```

In [16]:
```
from sklearn.linear_model import LinearRegression
from sklearn.metrics import r2_score
model=LinearRegression()
model.fit(x_train,y_train)
y_pred=model.predict(x_test)
r2=r2_score(y_test,y_pred)
print("r2_score:",r2)
```

```
r2_score: 0.20441496419187943
```

In [ ]:
```

```