Support Vector Regression (SVR)

October 15, 2024

1 Support Vector Regression (SVR)

[1]:

```
# Importing the libraries
import numpy as np
import matplotlib.pyplot as plt
import pandas as pd
import os
```

[3]:

```
# Importing the dataset
os.chdir("C:\\Users\ddaya\OneDrive\Documents\Python_programming")
dataset = pd.read_csv('Position_Salaries.csv')
X = dataset.iloc[:, 1:-1].values
y = dataset.iloc[:, -1].values
print(X)
print(y)
y = y.reshape(len(y),1)
print(y)
```

```
[[ 1]
 [ 2]
 [ 3]
 [ 4]
 [ 5]
 [ 6]
 [ 7]
 [ 8]
 [ 9]
 [10]]
[  45000   50000   60000   80000  110000  150000  200000  300000  500000
 1000000]
[[  45000]
 [  50000]
 [  60000]
 [  80000]
 [ 110000]
 [ 150000]
 [ 200000]
 [ 300000]
 [ 500000]
 [1000000]]
```

[4]:

```python
# Feature Scaling
from sklearn.preprocessing import StandardScaler
sc_X = StandardScaler()
sc_y = StandardScaler()
X = sc_X.fit_transform(X)
y = sc_y.fit_transform(y)
print(X)
print(y)
```

```
[[-1.5666989 ]
 [-1.21854359]
 [-0.87038828]
 [-0.52223297]
 [-0.17407766]
 [ 0.17407766]
 [ 0.52223297]
 [ 0.87038828]
 [ 1.21854359]
 [ 1.5666989 ]]
[[-0.72004253]
 [-0.70243757]
 [-0.66722767]
 [-0.59680786]
 [-0.49117815]
 [-0.35033854]
 [-0.17428902]
 [ 0.17781001]
 [ 0.88200808]
 [ 2.64250325]]
```

[5]:

```python
# Training the SVR model on the whole dataset
from sklearn.svm import SVR
regressor = SVR(kernel = 'rbf')
regressor.fit(X, y)
```

```
C:\Users\ddaya\devi\anaconda3\Lib\site-
packages\sklearn\utils\validation.py:1143: DataConversionWarning: A column-
vector y was passed when a 1d array was expected. Please change the shape of y
to (n_samples, ), for example using ravel().
  y = column_or_1d(y, warn=True)
```

[5]:

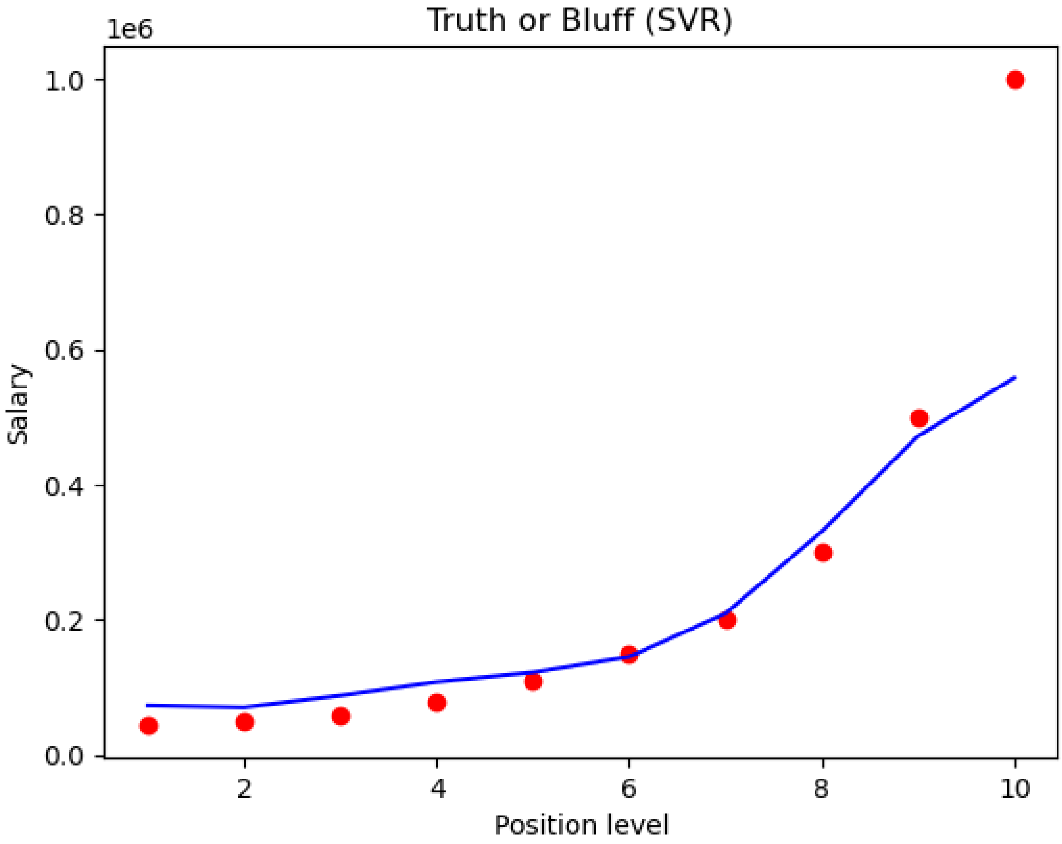
```
SVR()
```

[6]:

```python
# Predicting a new result
sc_y.inverse_transform(regressor.predict(sc_X.transform([[6.5]])).reshape(-1,1))
```

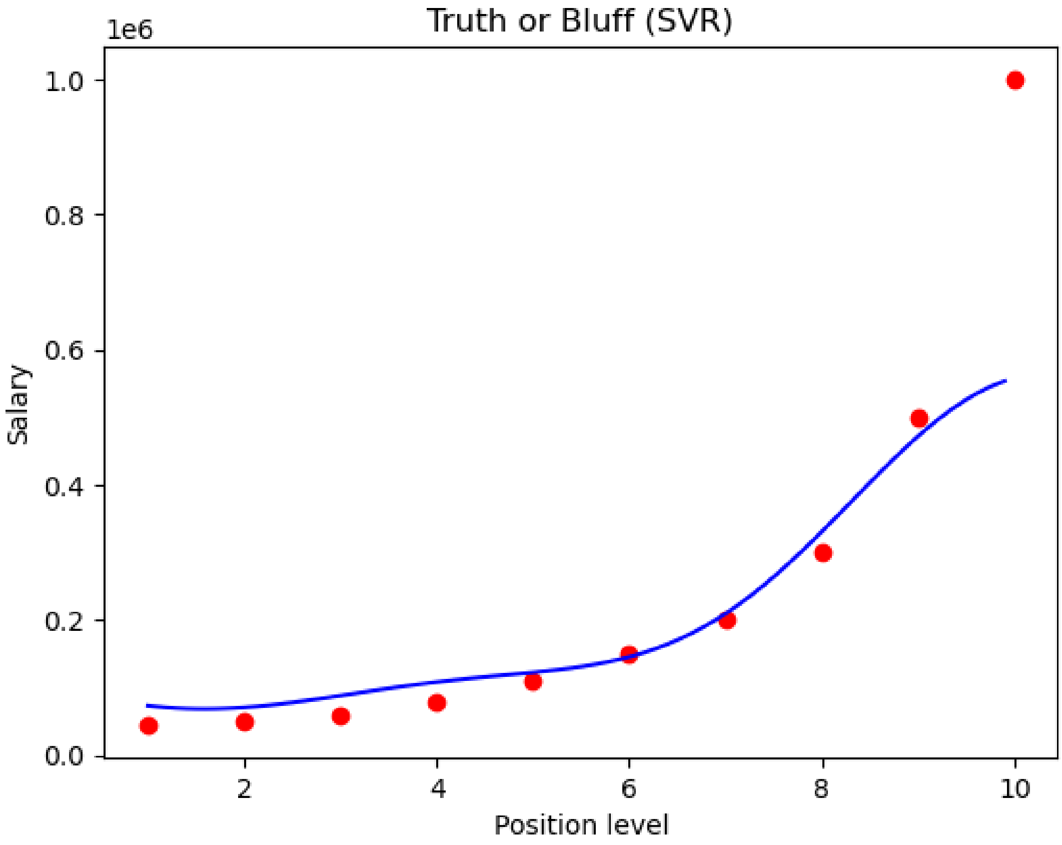
[6]:
```
array([[170370.0204065]])
```

[7]:
```
# Visualising the SVR results
plt.scatter(sc_X.inverse_transform(X), sc_y.inverse_transform(y), color = 'red')
plt.plot(sc_X.inverse_transform(X), sc_y.inverse_transform(regressor.predict(X).
  ↪reshape(-1,1)), color = 'blue')
plt.title('Truth or Bluff (SVR)')
plt.xlabel('Position level')
plt.ylabel('Salary')
plt.show()
```



[8]:
```
# Visualising the SVR results (for higher resolution and smoother curve)
X_grid = np.arange(min(sc_X.inverse_transform(X)), max(sc_X.
  ↪inverse_transform(X)), 0.1)
X_grid = X_grid.reshape((len(X_grid), 1))
plt.scatter(sc_X.inverse_transform(X), sc_y.inverse_transform(y), color = 'red')
plt.plot(X_grid, sc_y.inverse_transform(regressor.predict(sc_X.
  ↪transform(X_grid)).reshape(-1,1)), color = 'blue')
plt.title('Truth or Bluff (SVR)')
plt.xlabel('Position level')
plt.ylabel('Salary')
plt.show()
```

```
C:\Users\ddaya\AppData\Local\Temp\ipykernel_13848\1617602608.py:2:
DeprecationWarning: Conversion of an array with ndim > 0 to a scalar is
deprecated, and will error in future. Ensure you extract a single element from
your array before performing this operation. (Deprecated NumPy 1.25.)
  X_grid = np.arange(min(sc_X.inverse_transform(X)),
max(sc_X.inverse_transform(X)), 0.1)
```



```
[ ]:
```