Support Vector Regression (SVR)

Importing the libraries

In [0]:
```
import numpy as np
import matplotlib.pyplot as plt
import pandas as pd
```

Importing the dataset

In [0]:
```
dataset = pd.read_csv('Position_Salaries.csv')
X = dataset.iloc[:, 1:-1].values
y = dataset.iloc[:, -1].values
```

In [3]:
```
print(X)
```

```
[[ 1]
 [ 2]
 [ 3]
 [ 4]
 [ 5]
 [ 6]
 [ 7]
 [ 8]
 [ 9]
 [10]]
```

In [4]:
```
print(y)
```

```
[  45000   50000   60000   80000  110000  150000  200000  300000  50000
0
 1000000]
```

In [0]:
```
y = y.reshape(len(y),1)
```

In [6]:

```
print(y)
```

```
[[  45000]
 [  50000]
 [  60000]
 [  80000]
 [ 110000]
 [ 150000]
 [ 200000]
 [ 300000]
 [ 500000]
 [1000000]]
```

Feature Scaling

In [0]:

```
from sklearn.preprocessing import StandardScaler
sc_X = StandardScaler()
sc_y = StandardScaler()
X = sc_X.fit_transform(X)
y = sc_y.fit_transform(y)
```

In [8]:

```
print(X)
```

```
[[-1.5666989 ]
 [-1.21854359]
 [-0.87038828]
 [-0.52223297]
 [-0.17407766]
 [ 0.17407766]
 [ 0.52223297]
 [ 0.87038828]
 [ 1.21854359]
 [ 1.5666989 ]]
```

In [9]:

```
print(y)
```

```
[[-0.72004253]
 [-0.70243757]
 [-0.66722767]
 [-0.59680786]
 [-0.49117815]
 [-0.35033854]
 [-0.17428902]
 [ 0.17781001]
 [ 0.88200808]
 [ 2.64250325]]
```

Training the SVR model on the whole dataset

In [10]:

```
from sklearn.svm import SVR
regressor = SVR(kernel = 'rbf')
regressor.fit(X, y)
```

```
/usr/local/lib/python3.6/dist-packages/sklearn/utils/validation.py:760:
DataConversionWarning: A column-vector y was passed when a 1d array was
expected. Please change the shape of y to (n_samples, ), for example us
ing ravel().
  y = column_or_1d(y, warn=True)
```

Out[10]:

```
SVR(C=1.0, cache_size=200, coef0=0.0, degree=3, epsilon=0.1, gamma='sca
le',
    kernel='rbf', max_iter=-1, shrinking=True, tol=0.001, verbose=Fals
e)
```

Predicting a new result

In [11]:

```
sc_y.inverse_transform(regressor.predict(sc_X.transform([[6.5]])))
```

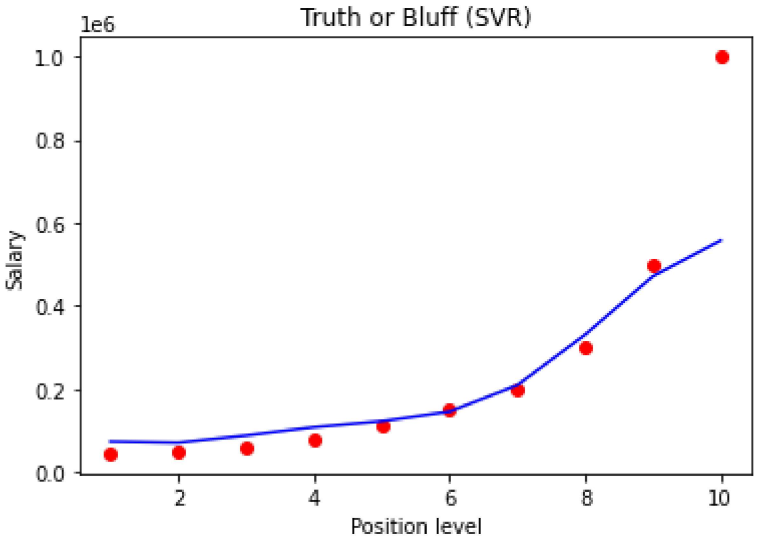
Out[11]:

```
array([170370.0204065])
```

Visualising the SVR results

In [12]:

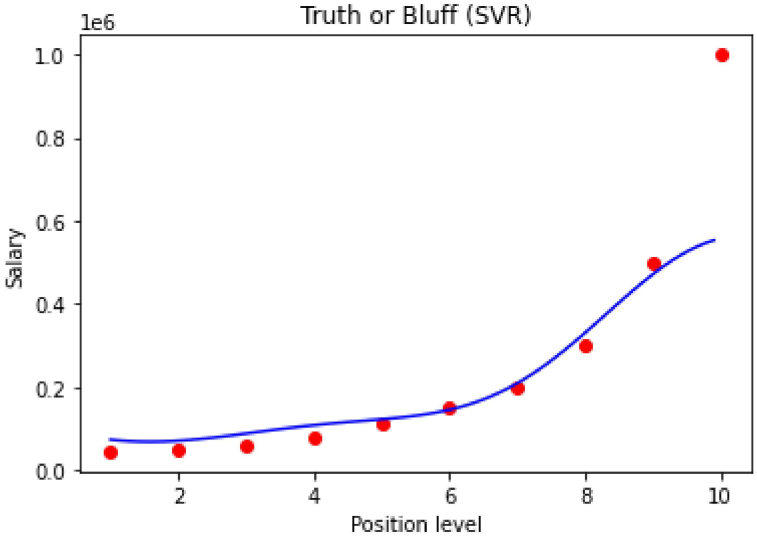
```
plt.scatter(sc_X.inverse_transform(X), sc_y.inverse_transform(y), color =
'red')
plt.plot(sc_X.inverse_transform(X), sc_y.inverse_transform(regressor.pred
ict(X)), color = 'blue')
plt.title('Truth or Bluff (SVR)')
plt.xlabel('Position level')
plt.ylabel('Salary')
plt.show()
```



Visualising the SVR results (for higher resolution and smoother curve)

In [13]:

```
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))), color = 'blue')
plt.title('Truth or Bluff (SVR)')
plt.xlabel('Position level')
plt.ylabel('Salary')
plt.show()
```


Truth or Bluff (SVR)
1e6
Salary
Position level