```python
#bad fit
import numpy
import matplotlib.pyplot as plt

X  = [23,76,45,67,7,6,22,23,43,45,67,87,83,76,3,2,12,91,32]
y =  [10,21,46,35,4,44,76,33,65,33,7,98,6,43,23,34,55,66,22]
```
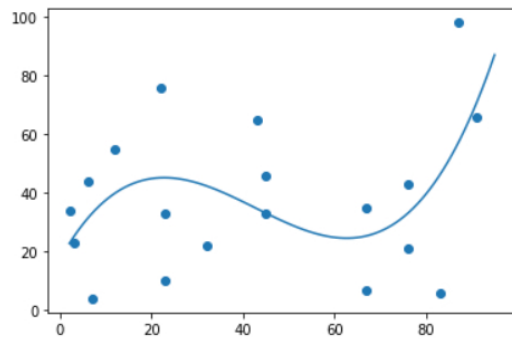
```python
model = numpy.poly1d(numpy.polyfit(X, y, 3))
myline = numpy.linspace(2, 95, 100)
plt.scatter(X,y)
plt.plot(myline,model(myline))
plt.show()
```



```python
import numpy
from sklearn.metrics import r2_score

print(r2_score(y, model(X)))
```

```python
import numpy
import matplotlib.pyplot as plt

x = [1,2,3,5,6,7,8,9,10,12,13,14,15,16,18,19,21,22]
y = [100,90,80,60,60,55,60,65,70,70,75,76,78,79,90,99,99,100]

mymodel = numpy.poly1d(numpy.polyfit(x, y, 3))

myline = numpy.linspace(1, 22, 100)

plt.scatter(x, y)
plt.plot(myline, mymodel(myline))
plt.show()
```
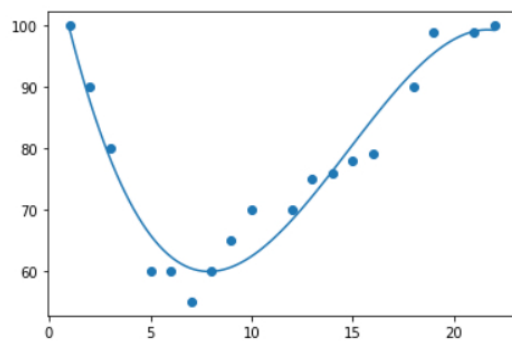


```python
import numpy
import matplotlib.pyplot as plt

x = [1,2,3,5,6,7,8,9,10,12,13,14,15,16,18,19,21,22]
y = [100,90,80,60,60,55,60,65,70,70,75,76,78,79,90,99,99,100]

mymodel = numpy.poly1d(numpy.polyfit(x, y, 3))

print(r2_score(y, mymodel(x)))
```

```
0.9432150416451027
```

```python
speed = mymodel(18)
print(speed)
```

```
92.48673749579979
```

```python
# Importing the Dataset
import pandas as pd

df = pd.read_csv("Position_Salaries.csv")
df.head()
```

Out[ ]:

	Position	Level	Salary
0	Business Analyst	1	45000
1	Junior Consultant	2	50000
2	Senior Consultant	3	60000
3	Manager	4	80000
4	Country Manager	5	110000

In [ ]:

```python
X = df.iloc[:, 1:2].values
y = df.iloc[:, 2].values
```

In [ ]:

```python
from sklearn.model_selection import train_test_split
X_train, X_test, y_train, y_test = train_test_split(X, y , test_size = 0.2)
```
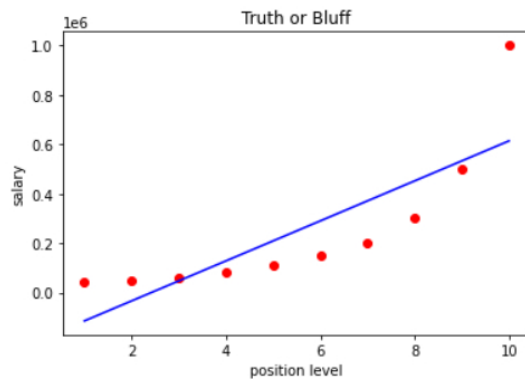
In [ ]:

```python
from sklearn.linear_model import LinearRegression
lin_reg = LinearRegression()
lin_reg.fit(X,y)
```

Out[ ]: LinearRegression()

In [ ]:

```python
def viz_linear():
    plt.scatter(X, y, color = 'red')
    plt.plot(X, lin_reg.predict(X), color = 'blue')
    plt.title('Truth or Bluff')
    plt.xlabel("position level")
    plt.ylabel('salary')
    plt.show()
    return
```

In [ ]:

```python
viz_linear()
```


In [ ]:

```python
# Fitting a Polynomial Regression Model
from sklearn.preprocessing import PolynomialFeatures
poly_reg = PolynomialFeatures(degree=4)
X_poly = poly_reg.fit_transform(X)
pol_reg = LinearRegression()
pol_reg.fit(X_poly, y)

def viz_polynomial():
    plt.scatter(X, y, color = 'red')
    plt.plot(X, pol_reg.predict(poly_reg.fit_transform(X)), color = 'blue')
    plt.title('Truth or Bluff')
    plt.xlabel("position level")
    plt.ylabel('salary')
    plt.show()
    return
viz_polynomial()
```
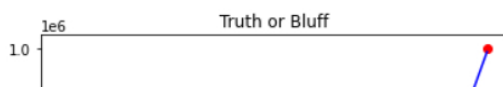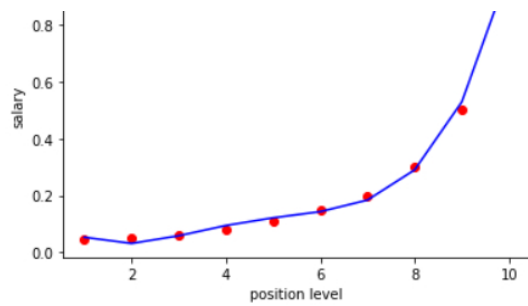
In [ ]:
```python
pred_linear = lin_reg.predict([[11]])
```

In [ ]:
```python
pred_polymoinal = pol_reg.predict(poly_reg.fit_transform([[11]]))
```

In [ ]:
```python
print("linear result:", pred_linear)
print("poymonial result:", pred_polymoinal)
```
```
linear result: [694333.33333333]
poymonial result: [1780833.33333322]
```

In [ ]:
```python
print("difference is : ", pred_polymoinal - pred_linear)
```
```
difference is :  [1086499.99999989]
```

In [ ]: