

Simple Linear-Poly

```
import pandas as pd

import matplotlib.pyplot as plt

from sklearn.linear_model import LinearRegression

from sklearn.preprocessing import PolynomialFeatures

from sklearn.metrics import r2_score

df = pd.read_csv('Position_Salaries (1).xls')

print(df.head())

# Sepaarte dependent and independent variables

X = df[['Level']].values

y = df['Salary'].values

# Fit Simple Linear Regression

linear_model = LinearRegression()

linear_model.fit(X, y)

# Polynomial Regression

poly_model = PolynomialFeatures(degree=4)

X_poly = poly_model.fit_transform(X)

lin_reg_poly = LinearRegression()

lin_reg_poly.fit(X_poly, y)

# Predict salaries for Level 11 nd 12 for both linear and polylinear

linear_model.predict([[11]])[0]

linear_model.predict([[12]])[0]

lin_reg_poly.predict(poly_model.transform([[11]]))[0]

lin_reg_poly.predict(poly_model.transform([[12]]))[0]

#Make prediction
```

```
y_pred_linear = linear_model.predict(X)

y_pred_poly = lin_reg_poly.predict(X_poly)

print("Linear Regression R2 Score:", r2_score(y, y_pred_linear))
print("Polynomial Regression R2 Score:", r2_score(y, y_pred_poly))

# Scatter original data
plt.scatter(X, y, color='red', label='Original Data')

# Plot Linear Regression
plt.plot(X, y_pred_linear, color='blue', label='Linear Regression')

# Plot Polynomial Regression
plt.plot(X,y_pred_poly, color='green', label='Polynomial Regression')
plt.title('Position Level vs Salary')
plt.xlabel('Position Level')
plt.ylabel('Salary')
plt.show()
```