

## 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()
```