POLYNOMIAL REGRESSION

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1 Abstract

The relationship between an individual's position within a company and their salary is a critical aspect of human resource management and organizational dynamics. Understanding and predicting salary levels based on job roles can provide valuable insights for both employers and employees. This study aims to explore the factors influencing salary determination and develop a predictive model for estimating salaries based on the positions held within a company. By leveraging data analytics and machine learning techniques, we seek to uncover patterns and trends that contribute to salary differentials across various hierarchical levels. The findings of this research could empower organizations to make informed decisions regarding compensation structures, career planning, and talent management.

2 Introduction

The compensation of employees is a multifaceted and intricate aspect of organizational management. The remuneration an individual receives is influenced by a myriad of factors, with the position within the company being a pivotal determinant. Companies often employ diverse strategies for salary structuring, considering the responsibilities, skills, and experience associated with different job roles. Understanding the relationship between a person's position in a company and their salary is essential for both employers and employees. For organizations, it helps in designing fair and competitive compensation packages, optimizing resource allocation, and retaining top talent. For individuals, having insights into the salary expectations associated with specific positions aids in career planning, negotiations, and overall professional development. This research aims to delve into the complexities of salary determination based on positions within a company. By utilizing advanced analytics and machine learning, we aim to develop a predictive model that can estimate salaries based on various job roles. Such a model could provide a valuable tool for human resource professionals, recruiters, and employees alike, fostering transparency and informed decision-making in the realm of compensation. The subsequent sections of this study will elaborate on the methodology, data sources, and analyses performed to achieve the objectives outlined in this introduction. The ultimate goal is to contribute to the existing body of knowledge on salary determination and enhance the tools available for effective human resource management.
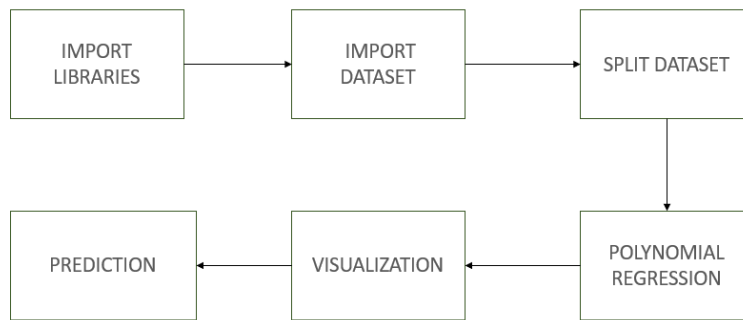
3 Block Diagram

Figure 1: Block Diagram Of Design Of Digital Filter

3.1 Import necessary libraries:

import numpy as np
import pandas as pd
import matplotlib.pyplot as plt

3.2 Import data set:

Load the dataset-Reading a CSV file containing position levels and corresponding salaries.

3.3 Split the dataset :

Split the dataset into independent variable (x) and dependent variable (y).
x = dataset.iloc[:, 1:2].values
y = dataset.iloc[:, 2].values .

3.4 Polynomial Regression :

Fit a polynomial regression model $(\lin_reg_2) with degree 5 from sklearn.preprocessing import PolynomialFeatures poly_reg = PolynomialFeatures(degree = 5)$
$x_poly = poly_reg.fit_transform(x)$
$poly_reg.fit(x_poly, y)$
$lin_reg_2 = LinearRegression()$
$lin_reg_2.fit(x_poly, y).$

3.5 VISUALIZATION:

3.5.1 Scatter plot of actual data points in red.

3.5.2 Polynomial regression model curve in blue.

3.5.3 Annotate specific points (6.5, 7.5, 8.5, 11.5) with their predicted salaries

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3.6 PREDICTION:

Predicts the salary based on the number of years of experience.
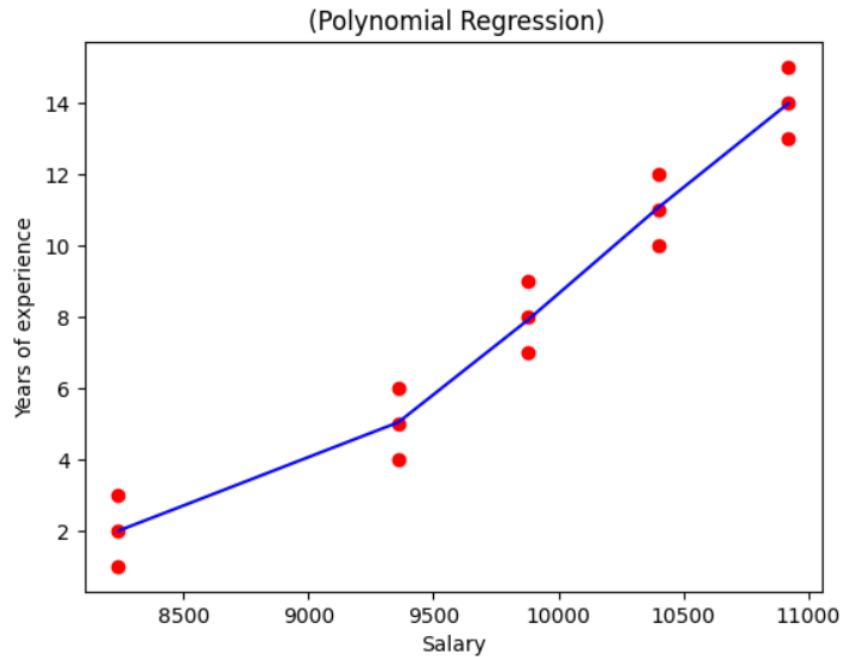
4 Expected Output

Figure 2: Ouput Plotted against Salary vs Years of Experience

References

[1] Richard M. Heiberger and Erich Neuwirth. *Polynomial Regression*, pages 269–284. Springer New York, New York, NY, 2009.

[2] Eva Ostertagová. Modelling using polynomial regression. *Procedia Engineering*, 48:500–506, 2012. Modelling of Mechanical and Mechatronics Systems.

[1] [2]