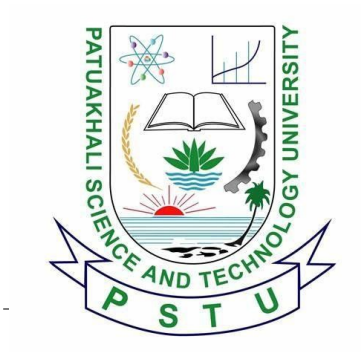

PATUAKHALI SCIENCE AND TECHNOLOGY UNIVERSITY

COURSE CODE CCE 312
Numerical Methods Sessional

SUBMITTED TO:

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Assignment 07
Assignment title: Polynomial regression
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Polynomial Regression

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CONTENTS

Sample funtion

First, let's import `matplotlib.pyplot` and `numpy`, one for plotting and the other for numerical operations.

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

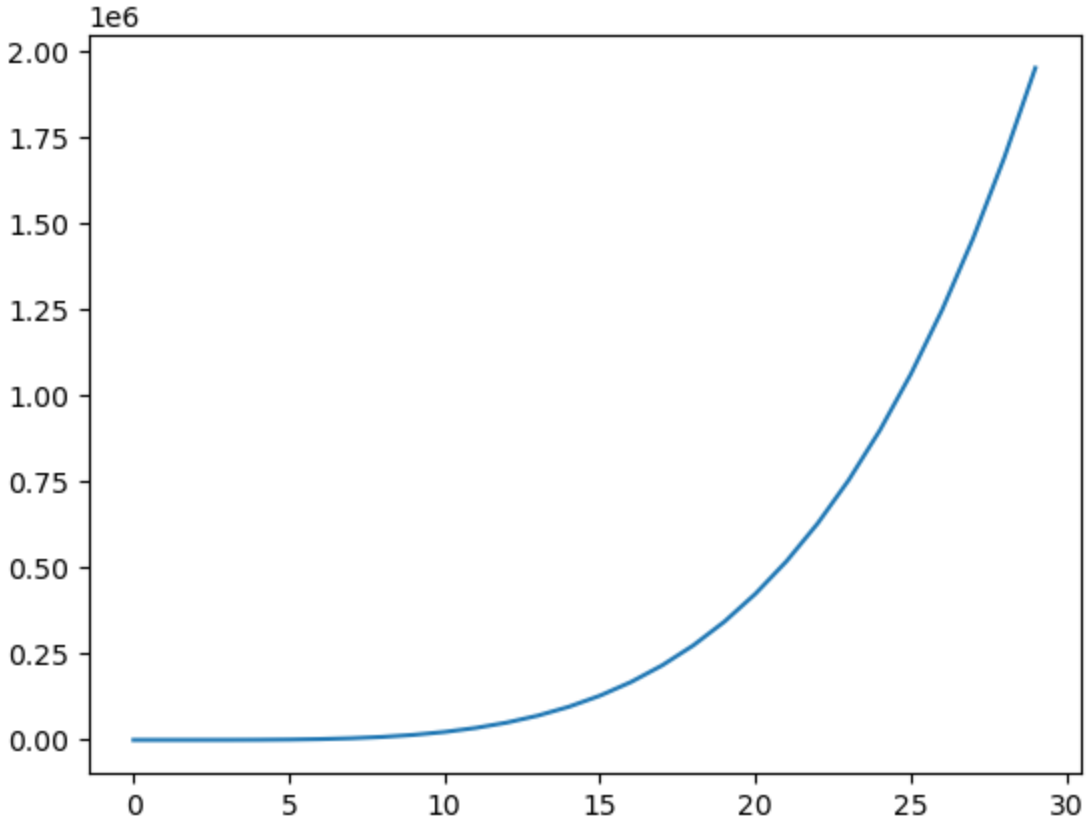
A basic function,

```
def fun(x):
    return 3 * x**4 - 7 * x**3 + 2 * x**2 + 11
```

Let's plot it!

```
x = np.arange(0, 30)
```

```
plt.plot(x, fun(x))
```



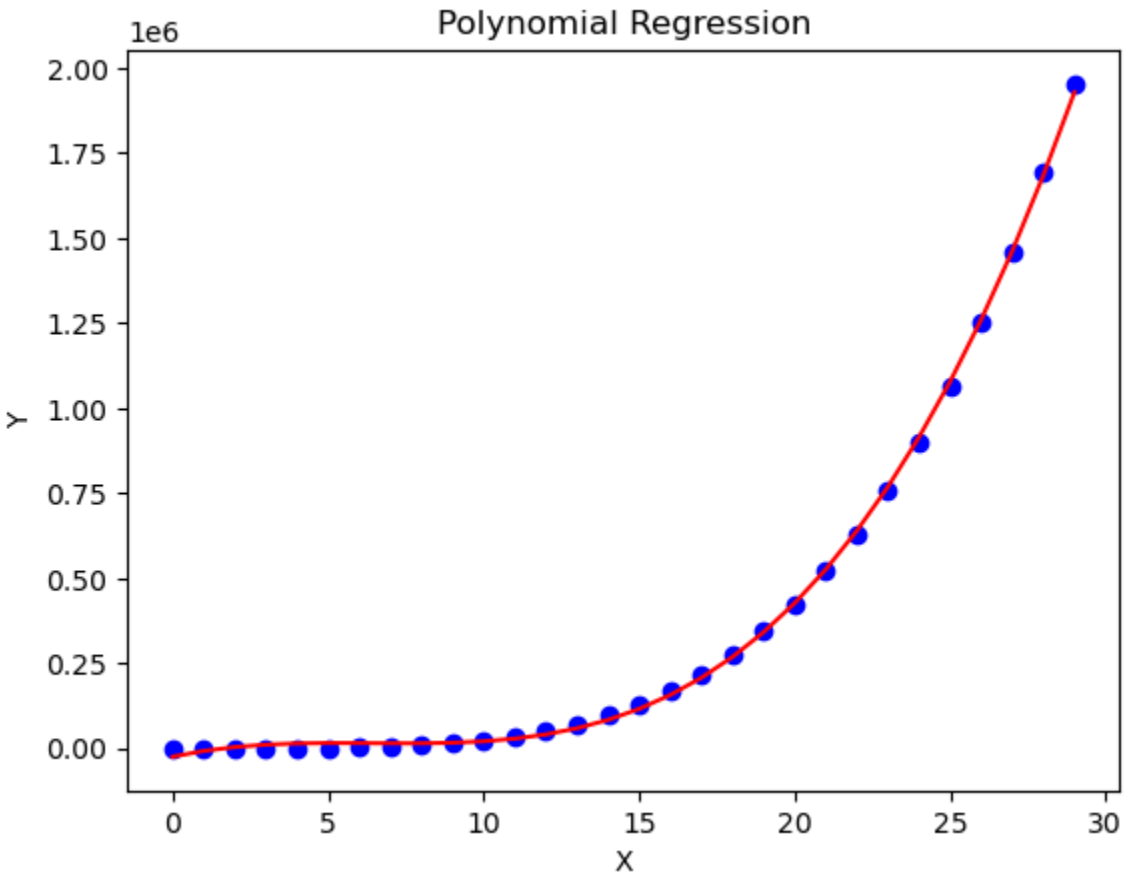
Polynomial Regression

```
from sklearn.preprocessing import PolynomialFeatures
from sklearn.linear_model import LinearRegression

def polynomial_regression(x, y, degree=3):
  poly = PolynomialFeatures(degree)
  x_poly = poly.fit_transform(x.reshape(-1, 1))

  model = LinearRegression()
  model.fit(x_poly, y)
  return model.predict(x_poly)
```

Let's visualize our result,

```
y_pred = polynomial_regression(x, fun(x))
```

```
plt.title('Polynomial Regression')
plt.plot(x, y_pred, color='red')
plt.scatter(x, fun(x), color='blue')
plt.xlabel('X')
plt.ylabel('Y')
```



Numerical Methods
Linear Regression

Data Analysis
Data Analysis