# **Artificial Intelligence and Machine Learning Fundamentals**

**Activity 5**: Predicting Population

You are working at the government office of Metropolis, trying to forecast the need for elementary school capacity. Your task is to figure out a 2025 and 2030 prediction for the number of children starting elementary school. Past data are as follows:



Plot tendencies on a two-dimensional chart. Use linear regression.

Our features are the years ranging from 2001 to 2018. For simplicity, we can indicate 2001 as year 1, and 2018 as year 18.

x = np.array(range(1, 19))

y = np.array([

147026,

144272,

140020,

143801,

146233,

144539,

141273,

135389,

142500,

139452,

139722,

135300,

137289,

136511,

132884,

125683,

127255,

124275

])

Use np.polyfit to determine the coefficients of the regression line.

[a, b] = np.polyfit(x, y, 1)

[-1142.0557275541753, 148817.5294117646]

Plot the results using matplotlib.pyplot to determine future tendencies.

import matplotlib.pyplot as plot

plot.scatter( x, y )

plot.plot( [0, 30], [b, 30\*a+b] )

plot.show()