# Investigation into Urban Population: A Comparative Analysis Across selected Countries

**Student Name: Ajah Stephen Chidi**
**Student Id: 22026656**
https://github.com/Ajah-Stephen/ads3

## Abstract

The report provides an in-depth examination of urban population trends across China, South Africa, and Germany from 1960 to 2022 using data from the World Bank. It highlights significant urbanization and economic growth in major economies like China, contrasting with the more gradual urban population increases in countries like South Africa and Germany. Through detailed data analysis and visualization, the report sheds light on the differing scales and trajectories of urbanization in these countries. This comparative study offers valuable insights into the dynamics of urban population growth, contributing to a broader understanding of global urbanization patterns.

## Introduction

This data set provides urban population statistics for various countries and regions over the period from 1960 to 2022. The urban population is in time series format and we can be trends and clusters globally and for specific countries or regions over the past six decades.

China's urban population has grown tremendously since 1960, far outpacing Germany and South Africa. Fueled by rapid economic development and rural-to-urban migration. In comparison, Germany and South Africa experienced relatively slower exponential urban growth, with Germany's urban population doubling from about 52 million to over 103 million and South Africa's quadrupling from around 10 million to over 44 million.

## Methodology

To analyze the urbanization trends, I applied exponential curve fitting applied to the urban population data for each country across the 1960-2022 time period. These fitted curves allow for estimating the growth rate and projecting future values based on the historical pace of development. Comparing the fitted curve parameters across countries also enables clustering countries into different urbanization trajectory groups based on the shape and inflection points of their exponential growth curves over time.

## Conclusions

The data line shows the actual urban population for each year. The exponential fit line shows the trend of the data, assuming that it is growing exponentially. The error range (shown as a shaded area around the exponential fit line) shows the range of values that the actual data could fall within,

The chart shows that all three countries have experienced rapid urban growth over the past 60 years. China's urban population has grown the most, from around 50 million in 1960 to over 1 billion in 2020. Germany's urban population has grown from around 30 million to over 80 million, and South Africa's urban population has grown from around 5 million to over 30 million.