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# POPULATION ANALYSIS IN PERAK FOR AREA DEVELOPMENT USING D3 TOOL

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## ABSTRACT

In a recent development, the data population has become a trend of analysis that can be valuable to make predictions on any area development. However, the available data on the population are left unstructured and disorganized due to the lack of useful information. Consequences of this problem, it can be hard to analyze the unpredicted data of the population area. This project aims to perform a population analysis in the aspect of specifying suitable property area by deploying the Data-Driven Documents (D3) data visualization method. To achieve this, the objectives of this project are to provide a web platform for analyzing data with the visualization of the D3 tool approach and simultaneously to provide a form of prediction of the population data in the state of Perak, Malaysia on the information visualization. The data of the population are collected from the Department of Statistics Malaysia's (DOSM) webpage in a form of *Comma Separated Value File (CSV)*. These data were organized to be structured and linked with the map of Perak and geographical coordination information to present the prediction on the future population of Perak state. An Exponential model equation has been used for the prediction method. The benefit of this project is to ease the user to gain useful information about the population in the state of Perak by having early planning for the future development with the population prediction.

**Keywords:** population, D3 tool, area development, visualization, prediction

## 1. INTRODUCTION

For some developing countries, the physical growth of a region is a major problem in terms of population distribution which requires land for area development [1]. Data of population is a basic requirement for many applications such as planning of services, election preparation, and housing development. However, there is a lack of accurate and updated information on the national population and housing census data, thus, various approaches are applied to produce a more reliable and spatially refined population estimation [2]. One of the approaches that have been used the most in data information on population is spatial data technique and according to [3], spatial data mining is the flow of finding fascinating and unknown important patterns which involve geostatistics investigation of statistics and topography that spots area accentuation on the spatial connection between the data. Moreover, in [4] study, visualization of data on geographical maps helps to identify and detect spot areas for easier retrieval of information. Therefore, by applying the spatial data mining approach, this project aims to produce a web-based population data visualization using the Data-Driven Documents (D3) tool and predict the possible development for some areas in Perak, Malaysia.

## 2. MATERIAL AND METHOD

The data of the population is retrieved from the Department of Statistics Malaysia (DOSM) webpage and stored in the database. The data extracted involving year, population, districts in Perak, and geo-coordinates are plotted on the Perak map using the D3 tool to visualize the data for a more informative way of displaying the data for users. Data analysis is performed during the processing stage. The exponential model is applied to predict the development of the area according to each district in Perak, Malaysia. Next, the D3 tool is used during the implementation of data visualization to display the necessary information on the geographical map by scattering the spotted area with different colours to make it easier for the end-user to interpret the information. The result of the visualized data is shown in Figure 1.

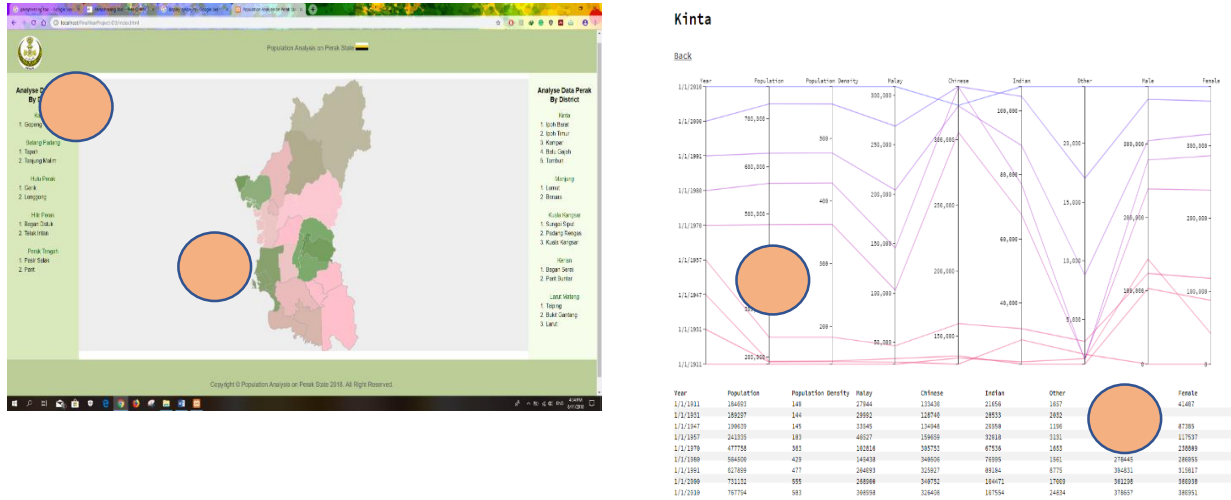


Figure 1. Visualized Data of Population

Based on Figure 1, the link for each of the district in Perak, Malaysia can be clicked to display the detailed information of population. The functions of the system are described in Table 1.

Table 1. System Functions

COMPONENT	DESCRIPTION
A	The link will allow user to see the data population of each district.
B	The canvas area shows the map of Perak state where user can hover and click on the map for each district to see the data of population of the selection.
C	The division grid of the data can be dragged up and down to visualize data for specific years.
D	The table of each row can hover to see the data graph that the user hover on.

Therefore, this system is beneficial for town planners to plan suitable developments for the areas based on population growth and other useful information.

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