



Machine Learning Dashboard for Property Analytics in Nigeria

By DataLab Nigeria

Overview of Solution

We designed a machine learning clustering dashboard which allows you to explore general property rent or prices at different locations in Lagos, Nigeria. This also includes breakdown of other features such as the number of bedrooms, bathrooms, and toilets. After choosing a cluster scheme you can filter and download clusters of locations along with property features identified by machine learning algorithm to make your location base property investment or house rent decisions.

Challenge

Individuals and real estate agents or companies do have tough and long hours browsing through lists of properties listed on property websites in Nigeria. While these websites may have options to get a particular house type, but this are mostly done through manual clicks of various buttons, and even when the filtering is done, the house data or information cannot be visualized and are not made available for one-time download.

Our Solution solves this problem by taking in a loaded housing data and using machine learning solution to perform a one-time clustering or segmentation and to make the resultant segmentation downloadable for onward housing decision and for more insights via an interactive dashboard. More also, machine learning techniques are quite intuitive than manual sorting.

Approach and Functions

The dataset used for this project was not initially available anywhere. DataLab carried out web scraping of a property website in Nigeria. The website has property listings for sale, rent and lease. The web scraping was done using sophisticated python programming and formatted to be suitable for this project.

Afterward the data was loaded into R Studio which is an integrated development environment for coding in R . Various data processing was done and K-Means clustering which is an intelligent machine learning algorithm was set-up on the data for real-time clustering or segmentation. To enable user interaction with the solution, R Shiny was used to develop an interactive dashboard that takes user inputs and perform clustering of houses automatically based on user options and make the outcome downloadable, and user can also filter based on clusters or house features through an interactive dashboard.

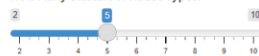
Property Analytics Dashboard

WELCOME ,this machine learning

dashboard allows you to explore general property prices at different locations in Lagos, Nigeria this is base on general cost of Rent and the associated number of bedrooms in those areas. Simply,move the slider at right for more or less clusters and to get summary statistics. The dashboard uses K-Means clustering which is intelligent enough to help group similar items in the form of clusters.

After choosing a cluster scheme you can filter and download clusters of locations identified by the algorithm along with property features to make your location base property investment or house rent decisions.

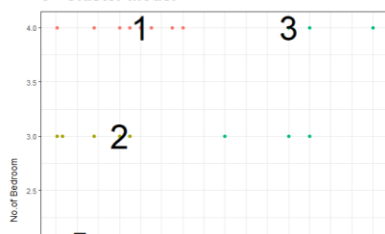
How Many Clusters of House Types?



Machine Learning Clustering Algorithm in Use

K-means

5 - Cluster Model



Cluster Summary Table

Clusters of Properties in Lagos							
Median Rent	Median No.Bedroom	Cluster Id	Min. Rent	Max. Rent	Min. No.Bedroom	Max. No.Bedroom	
600,000	1	4	300000	1800000	1	1	
1,100,000	2	5	700000	2000000	2	2	
3,000,000	3	2	50000	3500000	3	3	
4,000,000	4	1	50000	6000000	4	4	
11,000,000	4	3	8000000	15000000	2	4	

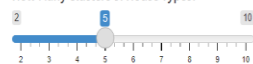
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Wait Calculation in Progress ...

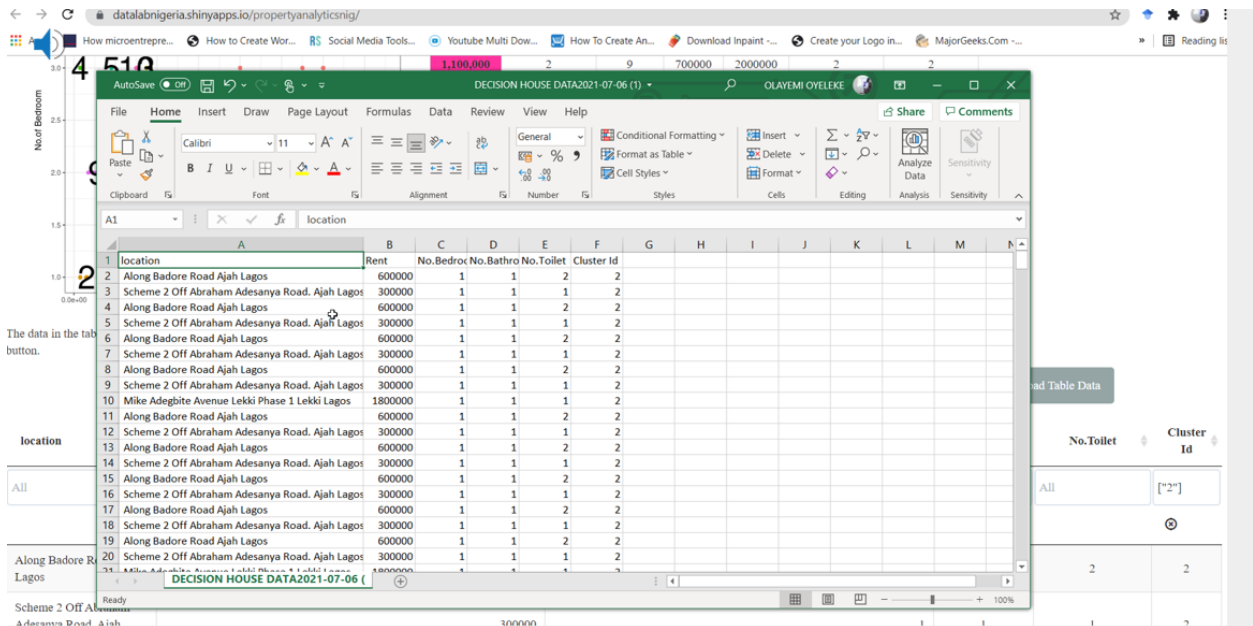


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1,100,000	2	8	700000	2000000	2	2	
3,500,000	3	1	3500000	3500000	3	3	
300,000	3	4	50000	300000	3	3	
3,000,000	3	6	1800000	3000000	3	3	



The User interfaces of the Web Application and functions

Other Areas of Application

Other areas where this solution can be adopted include the following:

Marketing: This solution can be used for customer segmentation, which is a process of dividing customers into different groups based on their behaviour or characteristics. Customer segmentation can help optimize marketing campaigns, reduce targeting the wrong segment of customers and can be used to achieve appropriate product pricing and recommendations. Our machine learning powered dashboards that can help businesses find customer segments that would be very difficult to spot through human intuition and manual examination of data.

Financial Transactions: This solution uses machine learning clustering technique which can also be used in detection of fraud or financial anomalies. As a data mining function, cluster analysis serves as a tool to gain insight into the distribution of data to analyze the characteristics of each cluster. This can help group similar behaviours. Based on the characteristics of the groups or clusters a company will be able to identify transactions that are real and those that are suspicious.

Other Company Operations : The challenge here is that most times companies do not know the best approach to take when it comes to some of their operations. Using machine learning clustering technique, an interactive dashboard can be developed that can help find similar

potential employees, investment options, maintenance options, task options etc. using some of their characteristics. This can be done using K-Means clustering. Ultimately this means a company can make quality decision quickly saving them time.

This Dashboard is live online here:

<https://datalabnigeria.shinyapps.io/propertyanalyticsnig/>

Looking for something like this for your business or project? Contact us on: +2348139608388(WhatsApp), email: training@datalab.com.ng