

GEOGRAPHIC INFORMATION SYSTEM

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The geographic information system is designed to capture, store, manipulate, analyze, manage, and present spatial or geographic data. It is a multi Layer application which provides quick access to the locations around the globe which are vulnerable to volcanoes and also gives its elevation data .This tool also helps in analyzing the population boom in various parts of the globe.The application demonstrates he data on a web map which makes it easy to analyze and study.

1. INTRODUCTION

The geographic information system is 3 layered tool designed for demonstrating the volcanic conditions around the globe and the population boom across every country.It is a python tool used to analyze spatial information in more user friendly format.The application provides the user a webmap interface with options to change the layers according to the purpose . It is an information system that integrates stores, edits, analyzes, shares, and displays [geographic](#) information.

2. ALGORITHM

Linear search algorithm is used to find out the volcano affected areas using latitude and longitude.The elevations of respective volcanoes are depicted as a popup message by traversing through every location of volcano on the globe.The lambda function of python is used to retrieve the population of every country and coloring them on map respectively.

3. LITERATURE

This geographic information system is a tool used generically for any computer-based capability for manipulating geographical data.Taking reference from “an overview of geographic information system and its role and applicability in environment monitoring and process modeling.”research paper by MiroslavRusko,SlovakUniversity of Technology in Bratislava which depicts that GIS is not simply a system formaking maps (although it can create maps at different scales, in different projects), a GIS is an analysis tool as well.GIS occurs in almost every industry. It is used foreducation, land management, natural Resource management, environmental and aeronauticalapplications (data on rocks, water, soil, atmosphere, biological activity, natural hazards, and disasters collected for wide range of Spatial levels of resolution).

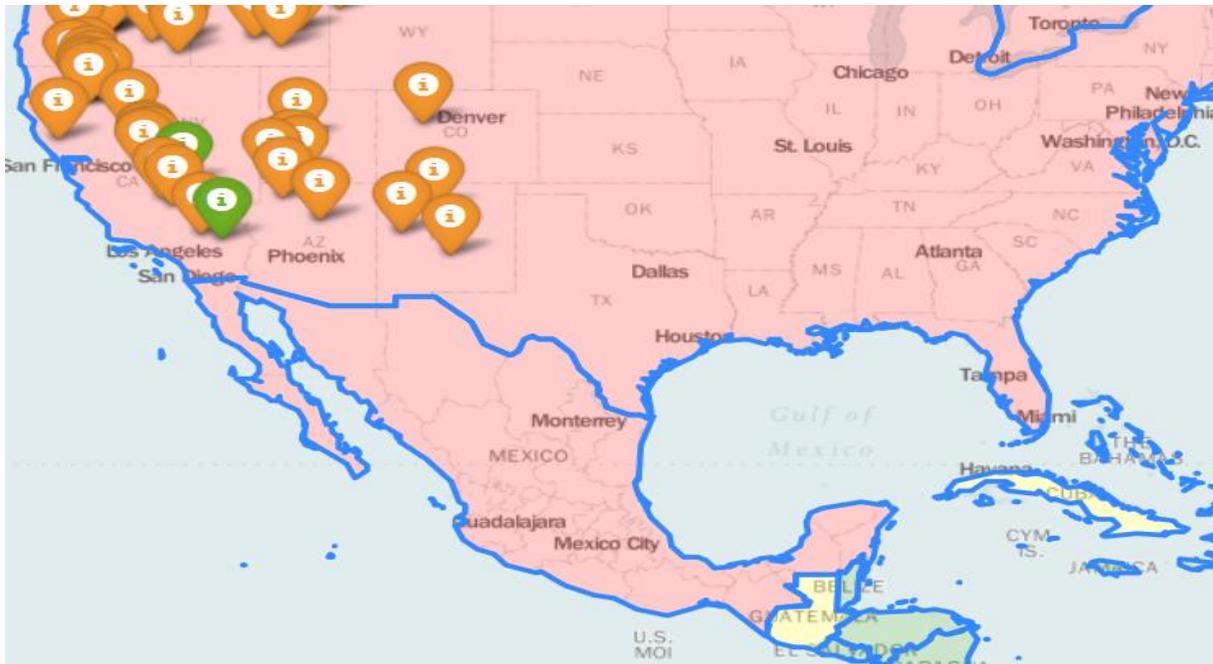
3. DESCRIPTION

THE geographic information system is an application made using python ,html and css.The components of the application can be described as:



a)The layer demonstrating the extinct/active volcanoes around the globe with its elevation being displayed as popup messages on the web map. The volcano affected areas are indicated using markers.This layer is made using the python libraries –folium and pandas. The folium library is used to display web maps and helps including various features to the maps.The features like multiple layers , pin point makers ,polygonal dissections and popup messages on the web map are included by using folium library. The next library which is imported is pandas.Pandas library is used to extract data from the json file and include it in the python program.

The colors of different markers demonstrate the elevation of respective volcanic areas.



b) The second layer of the application demonstrates the population number across different countries around the globe. The color of different countries demonstrates the population number of that country. The information for this layer is extracted using pandas library. The countries with population of less than 10 million are denoted with green color. The countries with population in between 10 million and 20 million are denoted with yellow and more than 20 million is denoted with red.

4. CONCLUSION

This geographic information system has multiple advantages such as quick access to the data of volcano affected areas in a user friendly web map. The multilayer system also denotes the population number of every country across the globe. This GIS tool can be used for education purpose or as an analysis tool in various fields. It is a python based tool which makes it flexible and robust for future advancements.

5. REFERENCES

1. BERNHARDSEN, T. Geographic Information Systems: An Introduction. Publisher: John Wiley. 1999. ISBN 0-4713-21923
2. An overview of geographic information system and its role and applicability in environment monitoring and process modeling, Miroslav RUSKO, Roman CHOVANEC, Dana ROŠKOVÁ