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Introduction:

In this lab we were supposed to create a smart searching program for cities. We were provided with a CSV file containing country code, latitude and longitude of the countries. Purpose of this lab was to introduce us to hibernate and we were supposed to build mysql client using hibernate.

Approach:

For this lab a fairly simple approach was used. Hibernate was downloaded and all the jars files were extracted to one folder which was later on added to the netbeans project. To generate hibernate mapping file for POJOs, Hibernate Reveng configuration file and Hibernate default configuration file, netbeans plugin was used. Hibernate connects to the mysql database hosted on LAMP server on the local machine.

One major problem was to solve the problem of searching nearest cities. Pathegoras theorem is used to search the nearest cities and the city with latitude and longitude to be providing least distance is the nearest city. It assumes that earth diameter is always greater than any distance between nearest cities.

There is a proper User Interface Provided for searching.

Design:

There are 4 classes.

1) CatalogueAdder:

Purpose of this class is to add all the cities from CSV file into mysql database using hibernate. There are three functions in this class:

1) private void readFile(String s):

This function reads the CSV file and extracts all the values of column in an array.

2) private void addCity(City city):

This function writes all the values of class City into mysql using hibernate

3) public void startProgram():

This function is the main entry point which specifies file location of CSV file and starts catalogue adding process.

2) CitySearch:

This class does smart search given the latitude and longitude it shows the nearest countries to the user. This class uses hibernate to extract data from MYSQL and does extra processing on this data then.

1) findCityByLocId(int locId):

This function uses hibernate to find the city with id equals to locId

2) SearchNearestCities(double lat, double lng, String limit)

This function finds the nearest city by applying pathegoras theorem to the given lat and long with the lat and long table in mysql. It limits the query results to the given argument.

3) findCityDistance(double lat1, double lng1, double lat2, double lng2)

This function finds the distance between two given points using the great circle formulae.

3) City:

This is the model class which is used to store information. It includes 4 attributes:

1) int locId: Location id of city

2) String country: name of the country this city is in  
 3) double lat: latitude of the city  
 4) double lng: longitude of the city

4) StartProgram:

It is the main entry point of whole program and contains 2 methods. One to search the city by location id and another to search the nearest 5 cities. Both the methods first see if database is empty, if it is then they first call the catalogueAdder and fill the database.

i)SearchByLocId(int locId):

This function is used to search through location Id

ii)SearchNearestCities(double lat, double lng):

This function is used to search using nearest cities to the provided latitude and longitude.

Github:<https://github.com/gul98/SoftwareConstruction_lab05>