# Lab 3

## Team member

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## Input data

GeoLife project (http://research.microsoft.com/en-us/downloads/b16d359d-d164-469e-9fd4-daa38f2b2e13/)

## How to run and test

- Run:
    - java TrajDB
    - It will ask you to enter the folder path to store your trajectory sets.
- Available Command
    - CREATE <tname>;
    - SOURCE <tname> <sourcePath>;
        - <sourcePath> is path of trajectory set folder which includes original trajectories data
        - For example, /Users/XXX/Downloads/Geolife Trajectories 1.3/Data/001/Trajectory
    - INSERT INTO <tname> VALUES <sequence>;
    - DELETE FROM <tname> TRAJECTORY <id>;
    - RETRIEVE FROM <tname> TRAJECTORY <id>;
    - RETRIEVE FROM <tname> COUNT OF <id>"
    - RETRIEVE FROM <tname> WHERE <field><op><val>;
        - field is lat, long, alt or date
        - op is an operator such as =, <, >, <=, >=;
        - val is a value;
    - EXIT;

## Trajectories Store Structure

- One Trajectory Set as one folder, which is consist of one Trajectory file and one Summary file
    - One Trajectory as one file

- Trajectory id as file name
- One measure as one line
  - Include Lat, Lon, Height, 0, Date number, Date String, Time String
- One Summary file
  - One Trajectory's information as one line
    - Include Trajectory id, Line count, Max Lat, Min Lat, Max Lon, Min Lon, Max Height, Min Height, Max Date, Min Date

## Details for each Command

- CREATE <tname>;
  - If Trajectory set existed, return false.
  - Else, create a new set folder named tname and return true.
- SOURCE <tname> <sourcePath>;
  - If Trajectory set already existed, report error
  - Else, create a set folder named tname.
  - Load all trajectories from <sourcePath> to the newly created folder
  - Create File Summary in the newly created folder
  - Write Trajectory id, Line count, Max Lat, Min Lat, Max Lon, Min Lon, Max Height, Min Height, Max Date, Min Date for each trajectory into File Summary
  - Return true if success
- INSERT INTO <tname> VALUES <sequence>;
  - If trajectory set doesn't exist, fail
  - Else, create a trajectory file named as current timestamp(Unique ID).
  - Append Trajectory id, Line count, Max Lat, Min Lat, Max Lon, Min Lon, Max Height, Min Height, Max Date, Min Date of this trajectory to the Summary File in this trajectory set
  - Return trajectory id if success
- DELETE FROM <tname> TRAJECTORY <id>;
  - If trajectory set doesn't exist, return error
  - Else, if the trajectory file doesn't exist, return false with message
  - Else, remove the trajectory file from the file system
  - Delete the corresponding records in Summary File
  - Return true if success
- RETRIEVE FROM <tname> TRAJECTORY <id>;
  - If trajectory set doesn't exist, return error
  - Else, if the trajectory file doesn't exist, return false with message
  - Else, print the trajectory on the screen
  - Return true if success
- RETRIEVE FROM <tname> COUNT OF <id>"
  - If trajectory set doesn't exist, return error
  - Else, if the trajectory file doesn't exist, return false with message

- o Else, search the records of the target trajectory in Summary file
- o Print the number of measures of target trajectory on the screen
- o Return true if success
- RETRIEVE FROM <tname> WHERE <field><op><val>;
    - o If trajectory set doesn't exist, return error
    - o Else, search Summary file to find trajectories that satisfy the conditions
    - o Print measures of trajectories that satisfy the conditions on the screen
    - o Return true if success