**OOP – Ex2 explanation**

**\*\* Our algorithm works only on our program's output files. You can find them in the folder "algo1\_files" \*\***

**Algo1:**

With this algorithm we can calculate w-center point for each MAC address that was captured in the app's scans.

For the first algorithm we created 3 classes:

Algo1\_line - every object of this class holds 3 parameters: Signal, Alt and Location.

We add option of sorting those objects by the signal.

Algo1\_linefile – this class is the output file format. Every line of the final CSV file contains several objects of the wifi network scan – time, Network object (=ssid, mac, signal and chanel) and the new point (Alt, Lat and Lon) of the w-weight center.

Algo\_1 – this is the main class for the first algorithm. This class holds several ArrayList -

**private** List<LineFile> \_file; //List of type LineFile

**private** List<Algo1\_linefile> \_fileList; //List of type LineFile which contains the merge CSV file

**private** ArrayList<Double> \_wLat; // new list for the Lat coordinate

**private** ArrayList<Double> \_wLon; // new list for the Lon coordinate

**private** ArrayList<Double> \_wAlt; // new list for the Alt coordinate

**private** ArrayList<Double> \_wWeigth; // new list for the weight according the equation

//the final points for every mac address **private** **double** wLon,wLat,wAlt;

**final** **int** max\_Signals = 4 ; //for wifi's with same mac address, we take only 4 strongest sorted by signal wifis.

**Functions:**

Locate\_Mac();

Search();

Calc\_Wsum();

readFile();

toCsv();

**Algo2:**

This algorithm allow calculating the location of the user by sampling of WIFI and signals that captured in the app's scans.

For the second algorithm we created 3 classes:

Algo2\_line- this class represent an object of algo2\_line. We add the option to get 2 signals and calculate the weight and the different between them, and get alt and location.

Algo2\_calc- every object of this class holds 3 parameters: Pi, Alt and Location, this meant to help the calculations for Algo2.

Algo\_2- this is the main class for the second algorithm. This class holds several ArrayList –

**Private** List<List<Algo2\_line>>\_list; //the excel list for all mac

**Private** List<Algo2\_calc>\_comb; //combined list for the final calculates

**Private** List<LineFile> \_input; // List of type LineFile which contains the input CSV file

**Private** List<LineFile> \_data; // List of type LineFile which contains the data CSV file

**Private** **double** \_alt; //the alt of the point

**Private** Point\_2D \_point; //the lat and lon (location) of the point

**Private** **double** w\_alt, w\_lon, w\_lat; //the final point for the user location

**Functions:**

search\_mac();

calc\_weight();

readFile();

readFile2();

toCsv();

**Constants Parameters:**

Norn: 10000- big number for norm.

Sig diff: 0.4- to pow in 0.4 the difference.

Min-diff: 3- the minimum different between the signals.

No signal: -120- if the mac address not equals and there is no signal we put -120.

Diff no sig: 100- if there is no signal, the difference will be 100.

Power: 2- to pow in 2 for the signal in the data file.