CS 2334 – Fall 2007
Project 2 Supplement

How to Calculate the Distance Between two Positions Represented in Latitude-Longitude

The equations below define the calculations required to calculate the distance between two positions, that are represented in latitude-longitude measurements.

The positons are represented as

```
lat1Deg – latitude of position 1 measured in degrees
lon1Deg – longitude of position 1 measured in degrees
lat2Deg – latitude of position 2 measured in degrees
lon2Deg – longitude of position 2 measured in degrees
```

The first step is to convert lat1Deg, lon1Deg, lat2Deg, and lon2Deg into radians. This can be done using the Math class:

```
lat1Rad = toRadians( lat1Deg )
lon1Rad = toRadians( lon1Deg )
lat2Rad = toRadians( lat2Deg )
lon2Rad = toRadians( lon2Deg )
```

Next calculate some intermediate values:

```
lonDiffDeg = lat1Deg – lat2Deg << ==== This equation is wrong,
                                      use the one below.
lonDiffDeg = lon1Deg – lon2Deg << ==== Use this equation instead.

lonDiffRad = toRadians( lonDiffDeg )
```

Then the distance is calculated with the following equation:

```
distanceRadians = acos(
                  sin(lat1Rad) * sin(lat2Rad) +
                  cos(lat1Rad) * cos(lat2Rad) * cos(longDiffRad) )

distDegrees = toDegrees( distanceRadians )

distMiles = distDegrees * 69
```

If you want the distance in kilometers, then multiply the distance in miles by 1.61.

This was taken from http://sniptools.com/latitudeLongitude.php, which may be helpful in determining if you have correctly implemented the calculation.