

CS 2334 – Spring 2009
Project 4 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 positions 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 = lon1Deg - lon2Deg;
lonDiffRad = toRadians(lonDiffDeg);
```

Then, the difference is calculated with the following equation:

```
distanceRadians = acos (
    sin( lat1Rad ) * sin( lat2Rad ) +
    cos( lat1Rad ) * cos( lat2Rad ) * cos( lonDiffRad ) );
distDegrees = toDegrees( distanceRadians );
distMiles = distDegrees * 69;
```

If you want the distance in kilometers, then multiply distMiles 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.