

CENG 112 – DATA STRUCTURES

Homework 2a

March 10, 2017

Due Date: March 17, 2017

Assignment 1 GPS Coordinates

Write a class named `GPSCoord` that represents a GPS coordinate with the following properties:

- `GPSCoord` should represent the longitude and latitude in degrees as `double` variables in the private section.
- Its constructor should take two parameters that are the initial values for these variables.
- It should have two public functions that return the latitude and longitude in degrees and another two functions that return these in radians.
- It should have a function `distance_to` that takes a constant reference to another `GPSCoord` object. The function should return the distance between the coordinates computed by the haversine formula as described in <http://www.movable-type.co.uk/scripts/latlong.html>.

Write a program `main.cc` that computes and prints the approximate distance between Izmir and Ankara in **kilometers** and also between the IYTE Mathematics Department building and the IYTE Library in **meters**. You can check the result by using the Google Maps.

Hints:

- You can learn the GPS coordinates in degrees by right clicking in Google Maps and selecting “What’s here?” link in the pop-up dialog.
- To measure distances in Google Maps right-click at the first location and select the “Measure distance” link. Clicking at the destination gives the distance.
- You will need mathematical functions and they are defined in the header `<cmath>`.
- Your code needs to be aligned properly and you must use consistent capitalization in variable and function names. Homeworks with inconsistent naming and indentation will lose up-to 15 points.