

Introduction to Computing

Section A, F, H, Fall 2019

Assignment 3

Due Date: Wednesday, October 30, 2019

1. Date and Time difference

Write functions, with given prototypes, for computing difference of dates and times:

```
int datediff(int y1,int m1,int d1,int y2,int m2,int d2,int& yd,int& md,int& dd);  
// return value is the difference in number of days  
// reference parameters used for difference in terms of years, months and days  
// write proper checks for leap year, number of days in months, etc.
```

```
int timediff(int h1,int m1,int s1,int h2,int m2,int s2,int& hd,int& md,int& sd);  
// return value is the difference in number of seconds  
// reference parameters used for difference in terms of hours, minutes and seconds
```

2. Cartesian and Polar conversion

Write a function that can convert Cartesian coordinates to Polar coordinates. Write another function for Polar to Cartesian conversion.

3. Geo-coordinates

Write a single function that can convert Geo-coordinates (Longitude and Latitude) expressed in degrees, minutes and seconds to their decimal equivalent.

Consider the following resources for explanation of Geo-coordinates and their conversion:

https://en.wikipedia.org/wiki/Geographic_coordinate_system

<https://www.latlong.net/degrees-minutes-seconds-to-decimal-degrees>

4. Reduce fraction

Write a function that takes two positive integer arguments as the numerator and denominator of a fraction, and reduces the fraction. This reduction is achieved by dividing each of the two arguments by the greatest common divisor of the two integers. The function should return the value 0 (to indicate failure to reduce) if either of the two arguments is zero or negative, and should return the value 1 otherwise.

Thus, for example, if `m` and `n` are two integer variables with values 25 and 15 respectively; then passing them as parameter to reduce function, will result in their values 5 and 3, upon exit from the function.