PR31 CDF_PCC

REVENU

distances.html

CDFPC9

/home/revenu/revenu/www/distances.html

Mardi 15 Mai 2001 18:21:00

```
<!-- filename = jslatlng.htm -->
<html>
<head>
<title>Distance Between Lat-Long Points / Lat-Long from Distance and Bearing</title>

<SCRIPT LANGUAGE="JavaScript">


var radian = 180/Math.PI;
var a = 6378.14;
var f = 1/298.257;
var e = 0.08181922;
var angsgn = " ";

// reduce the degrees,minutes,seconds to radians
function  combine(angsgn,angd,angm,angs) {
        angsgn = angsgn.toUpperCase()
        if (angsgn == "N" || angsgn == "E") {s = 1};
        if (angsgn == "S" || angsgn == "W") {s = -1};
        angle =s*(eval(angd)+eval(angm)/60 + eval(angs)/3600)/radian;
        return angle;
}

// calculate the distance between two coordinates
function calcDistance(lat1,long1,lat2,long2) {
        F = (lat1+lat2)/2;
        G = (lat1-lat2)/2;
        lambda = (long1-long2)/2;
        with(Math) {
        S = pow(sin(G)*cos(lambda),2)+pow(cos(F)*sin(lambda),2);
        C = pow(cos(G)*cos(lambda),2)+pow(sin(F)*sin(lambda),2);
        omega = atan(sqrt(S/C));
        R = sqrt(S*C)/omega;
        D = 2*omega*a;
        H1 =(3*R-1)/2/C;
        H2 =(3*R+1)/2/S;
        s = D*(1+f*H1*pow(sin(F)*cos(G),2)-f*H2*pow(cos(F)*sin(G),2));
                }
        return s;
}
// Calculate the three distances
function calcAll(form1)
{
        with(form1) {
        // retrieve the input data, convert to numbers and signed angle
                lt1= combine(lat1ns.value,lat1d.value,lat1m.value,lat1s.value);
                lt2= combine(lat2ns.value,lat2d.value,lat2m.value,lat2s.value);
                lt3= combine(lat3ns.value,lat3d.value,lat3m.value,lat3s.value);

                lg1= combine(long1ew.value,long1d.value,long1m.value,long1s.value);
                lg2= combine(long2ew.value,long2d.value,long2m.value,long2s.value);
                lg3= combine(long3ew.value,long3d.value,long3m.value,long3s.value);
        // calculate the distances and put them in the proper text boxes
        sAB = calcDistance(lt1,lg1,lt2,lg2);
        sBC = calcDistance(lt2,lg2,lt3,lg3);
        sCA = calcDistance(lt3,lg3,lt1,lg1);
        DistTOT.value = sAB + sBC + sCA;
        DistAB.value = sAB
        DistBC.value = sBC
        DistCA.value = sCA
                }
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}
// ************* functions for second part ******************

// calculate new lat-long with lat,long,bearing in radians, dist in km.
function calcLatLong(lt0,lg0,dis,bear) {
        with(Math) {
                R = a*(1-e*e)/pow((1-e*e*pow(sin(lt0),2)),1.5);
                psi = dis/R;
                phi = PI/2 - lt0;
                arccos = cos(psi)*cos(phi)+sin(psi)*sin(phi)*cos(bear);
                latA = (PI/2-acos(arccos))*radian;
                if (latA < 0) {latAsgn = "S"}
                        else {latAsgn = "N"};
                latA = abs(latA);
                latAd = floor(latA);
                frac = latA - latAd;
                latAm = floor(frac*60);
                latAs = round((frac - latAm/60)*3600);
                arcsin = sin(bear)*sin(psi)/sin(phi);
                longA = (lg0 - asin(arcsin))*radian;
                if (longA < 0) {longAsgn = "W"}
                        else {longAsgn = "E"};
                longA = abs(longA);
                longAd = floor(longA);
                frac = longA - longAd;
                longAm = floor(frac*60);
                longAs = round((frac - longAm/60)*3600);
                }
                return true;
}

function calcFinal(obj2) {
        with(obj2)      {
                v1 = lat0ns.value;
                v2 = lat0d.value;
                v3 = lat0m.value;
                v4 = lat0s.value;
                lt = combine(v1,v2,v3,v4);
                v1 = long0ew.value;
                v2 = long0d.value;
                v3 = long0m.value;
                v4 = long0s.value;
                lng = combine(v1,v2,v3,v4);
                b = (eval(bearing.value))/radian;               // degrees to radians
                d = eval(distance.value);
                calcLatLong(lt,lng,d,b);
                latd.value = latAd;
                latm.value = latAm;
                lats.value = latAs;
                latns.value = latAsgn;
                longd.value = longAd;
                longm.value = longAm;
                longs.value = longAs;
                longew.value = longAsgn;
        }
}


</SCRIPT>
</head>
<body>
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<h2>Calculator for Distances between Geographical Locations</h2>
<i>Note:This page requires that you have a browser that will run Java Script
and not have it disabled.<br>
Note 2: With Netscape Communicator the N,S,E,W letters do not show in the text boxes
(even
though they are there)- this is bug in Communicator - They appear OK in Netscape 2.02
.
</i>


<table cellspacing=2, cellpadding = 3, border=1>
<tr align="top"><td>
<H3 align=center>Distances between <br>Three Locations</H3>
<hr width=75%>
<P>Enter the Latitudes and Longitudes of the three points in degrees, minutes and sec
onds of arc.
<FORM Name="entry1" METHOD=POST>

<table><tr><td><b>Location A</b></td><td>--deg min sec</td></tr>

<tr><td>Latitude A</td>
<td>  <INPUT TYPE=TEXT NAME="lat1d" SIZE=2 MAXLENGTH=2>
<INPUT TYPE=TEXT NAME="lat1m" SIZE=2 MAXLENGTH=2>
<INPUT TYPE=TEXT NAME="lat1s" SIZE=2 MAXLENGTH=2>
<INPUT TYPE=TEXT NAME="lat1ns" SIZE=1 MAXLENGTH=1>N/S</td></tr>

<tr><td>Longitude A</td>
<td><INPUT TYPE=TEXT NAME="long1d" SIZE=3 MAXLENGTH=3>
<INPUT TYPE=TEXT NAME="long1m" SIZE=2 MAXLENGTH=2>
<INPUT TYPE=TEXT NAME="long1s" SIZE=2 MAXLENGTH=2>
<INPUT TYPE=TEXT NAME="long1ew" SIZE=1 MAXLENGTH=1>E/W</td></tr>

<tr><td><b>Turn Point B</b></td>
<td>--deg min sec</td></tr>

<tr><td>Latitude B</td>
<td>  <INPUT TYPE=TEXT NAME="lat2d" SIZE=2 MAXLENGTH=2>
<INPUT TYPE=TEXT NAME="lat2m" SIZE=2 MAXLENGTH=2>
<INPUT TYPE=TEXT NAME="lat2s" SIZE=2 MAXLENGTH=2>
<INPUT TYPE=TEXT NAME="lat2ns" SIZE=1 MAXLENGTH=1>N/S</td></tr>

<tr><td>Longitude B</td><td><INPUT TYPE=TEXT NAME="long2d" SIZE=3 MAXLENGTH=3>
<INPUT TYPE=TEXT NAME="long2m" SIZE=2 MAXLENGTH=2>
<INPUT TYPE=TEXT NAME="long2s" SIZE=2 MAXLENGTH=2>
<INPUT TYPE=TEXT NAME="long2ew" SIZE=1 MAXLENGTH=1>E/W
</td></tr>

<tr><td><b>Turn Point C</b></td><td>--deg min sec</td></tr>
<tr><td>Latitude C</td><td>  <INPUT TYPE=TEXT NAME="lat3d" SIZE=2 MAXLENGTH=2>
<INPUT TYPE=TEXT NAME="lat3m" SIZE=2 MAXLENGTH=2>
<INPUT TYPE=TEXT NAME="lat3s" SIZE=2 MAXLENGTH=2>
<INPUT TYPE=TEXT NAME="lat3ns" SIZE=1 MAXLENGTH=1>N/S
</td></tr>

<tr><td>Longitude C</td><td><INPUT TYPE=TEXT NAME="long3d" SIZE=3 MAXLENGTH=3>
<INPUT TYPE=TEXT NAME="long3m" SIZE=2 MAXLENGTH=2>
<INPUT TYPE=TEXT NAME="long3s" SIZE=2 MAXLENGTH=2>
<INPUT TYPE=TEXT NAME="long3ew" SIZE=1 MAXLENGTH=1>E/W
</td></tr>

<tr><td><INPUT TYPE=RESET value="clear all"></td>
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<td><input type="button" value="Calc. Distances" onClick="calcAll(top.document.entry1
);"></td></tr>

<tr><td>Distance A-B</td><td><INPUT TYPE=TEXT NAME="DistAB" SIZE=6> km</td></tr>
<tr><td>Distance B-C</td><td><INPUT TYPE=TEXT NAME="DistBC" SIZE=6> km</td></tr>
<tr><td>Distance C-A</td><td><INPUT TYPE=TEXT NAME="DistCA" SIZE=6> km</td></tr>
<tr><td>Total Distance</td><td><INPUT TYPE=TEXT NAME="DistTOT" SIZE=6> km</td></tr>
</table>
</FORM>
<P>This calculation uses the ellipsoid of the Earth(flattened by 1 in 298 with an equ
atorial radius of 6378.14 km.
</td>
<td align="top">
<H3 align=center>Location from Distance<br>and Bearing</H3>
<hr width=75%>

<P>Enter the Latitude and Longitude of the starting point, the distance (km) and bear
ing (degrees E of North) to another point.
<FORM METHOD=POST name="entry2">
<table>
<tr><td><b>Location</b></td><td>--deg min sec</td></tr>
<tr><td>Latitude</td>
<td>  <INPUT TYPE=TEXT NAME="lat0d" SIZE=2 MAXLENGTH=2>
<INPUT TYPE=TEXT NAME="lat0m" SIZE=2 MAXLENGTH=2>
<INPUT TYPE=TEXT NAME="lat0s" SIZE=2 MAXLENGTH=2>
<INPUT TYPE=TEXT NAME="lat0ns" SIZE=1 MAXLENGTH=1>N/S<br></td></tr>

<tr><td>Longitude </td>
<td><INPUT TYPE=TEXT NAME="long0d" SIZE=3 MAXLENGTH=3>
<INPUT TYPE=TEXT NAME="long0m" SIZE=2 MAXLENGTH=2>
<INPUT TYPE=TEXT NAME="long0s" SIZE=2 MAXLENGTH=2>
<INPUT TYPE=TEXT NAME="long0ew" SIZE=1 MAXLENGTH=1>E/W</td></tr>

<tr><td><b>Bearing</b> (East of True North)</td>
<td><INPUT TYPE=TEXT NAME="bearing" SIZE=5 MAXLENGTH=5>degrees</td></tr>

<tr><td><b>Distance </b>(km)</td>
<td><INPUT TYPE=TEXT NAME="distance" SIZE=5 MAXLENGTH=5>kilometres</td></tr>

<tr><td><INPUT TYPE=RESET value="clear all"></td>
<td><input type="button" value="Calc Coordinates" onClick="calcFinal(top.document.ent
ry2);"></td></tr>

<tr><td><b>Destination:</b></td><td>--deg min sec</td></tr>

<tr><td>Latitude </td>
<td>  <INPUT TYPE=TEXT NAME="latd" SIZE=2 MAXLENGTH=2>
<INPUT TYPE=TEXT NAME="latm" SIZE=2 MAXLENGTH=2>
<INPUT TYPE=TEXT NAME="lats" SIZE=2 MAXLENGTH=2>
<INPUT TYPE=TEXT NAME="latns" SIZE=1 MAXLENGTH=1></td></tr>

<tr><td>Longitude </td>
<td><INPUT TYPE=TEXT NAME="longd" SIZE=3 MAXLENGTH=3>
<INPUT TYPE=TEXT NAME="longm" SIZE=2 MAXLENGTH=2>
<INPUT TYPE=TEXT NAME="longs" SIZE=2 MAXLENGTH=2>
<INPUT TYPE=TEXT NAME="longew" SIZE=1 MAXLENGTH=1></td></tr>
</table>
</FORM>
<P>This calculation uses spherical trigonometry but with the local radius
of curvature of the Earth as determined by the ellipsoid of the Earth at the
starting location. This calculation is OK for distances of 100´s but not 1000´s
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of kilometres.
</td>
</tr>
</table>
<hr>
Created by Larry Bogan,<br>
April 1998 - Cambridge Station, Nova Scotia<br>
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</body>
</html>
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