Subject: Re: Finding distance with longitude and latitude
Posted by wlandsman on Sun, 14 Apr 2013 23:45:40 GMT
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On Sunday, April 14, 2013 7:22:44 PM UTC-4, gpet...@ucsc.edu wrote:

> a=sqrt((cos(lat2)*sin(dlon))^2 + (cos(lat1)*sin(lat2)-sin(lat1)*cos(lat2)*cos(dlon))^2)/(sin(lat1)*sin(lat2)+cos(lat1)*cos(lat2)*cos(dlat))

c= atan(a)

The Wikipedia article you quote says
"When programming a computer, one should use the atan2() function rather than the ordinary arctangent function (atan()), in order to simplify handling of the case where the denominator is zero, and to compute \Delta\widehat{\sigma}\;\! unambiguously in all quadrants"

Subject: Re: Finding distance with longitude and latitude
Posted by wlandsman on Sun, 14 Apr 2013 23:49:07 GMT
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On Sunday, April 14, 2013 7:45:40 PM UTC-4, wlandsman wrote:
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I accidentally hit SEND too soon, but you want to use the two argument form of ATAN, e.g.

c = atan(numerator, denominator)

--Wayne

Subject: Re: Finding distance with longitude and latitude
Posted by David Fanning on Sun, 14 Apr 2013 23:57:14 GMT
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gpeterso@ucsc.edu writes:

> Now I am trying to find the distance between longitude and latitude points using the vincenty formula form here: http://en.wikipedia.org/wiki/Great-circle_distance. I have completed this and I am getting logical answers I am just wondering if it is accurate or a correct.

You could test it by seeing if you get the same answers with Map_2Points
in the IDL library.

Cheers,

David

--
David Fanning, Ph.D.
Fanning Software Consulting, Inc.
Coyote's Guide to IDL Programming: http://www.idlcoyote.com/
Sepore ma de ni thue. ("Perhaps thou speakest truth.")

Subject: Re: Finding distance with longitude and latitude
Posted by gpeterso on Mon, 15 Apr 2013 01:17:41 GMT
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On Sunday, April 14, 2013 4:49:07 PM UTC-7, wlandsman wrote:
> On Sunday, April 14, 2013 7:45:40 PM UTC-4, wlandsman wrote:
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When ever i tried to use atan2() it said that the variable was undefined. I dont know why that would happen

---

Subject: Re: Finding distance with longitude and latitude
Posted by wlandsman on Mon, 15 Apr 2013 02:38:26 GMT
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IDL doesn't have an ATAN2 function. Instead, you call ATAN with two arguments. Look at the online help for ATAN

On Sunday, April 14, 2013 9:17:41 PM UTC-4, gpet...@ucsc.edu wrote:
> On Sunday, April 14, 2013 4:49:07 PM UTC-7, wlandsman wrote:
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Subject: Re: Finding distance with longitude and latitude
Posted by seanelvidge on Mon, 15 Apr 2013 11:13:25 GMT
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> Now I am trying to find the distance between longitude and latitude points using the vincenty

formula form here: http://en.wikipedia.org/wiki/Great-circle_distance. I have completed this and I am getting logical answers I am just wondering if it is accurate or a correct.
>

Vincenty's formula is the traditional approach to solving geodesic problems on an ellipsoid. However this method can fail under certain conditions, one of which being for near antipodal points.

However recently, Karney described a more accurate, robust and quicker solution to this problem using Newton's Method. (Described in his paper 'Algorithms for Geodesics' http://link.springer.com/content/pdf/10.1007%2Fs00190-012-05 78-z).

On Karney's site he has implementations of this for C++, C, Fortran, Python, Javascript and Matlab. In adition he provides an online calculator (http://geographiclib.sourceforge.net/cgi-bin/GeodSolve).

If you would like to use our IDL implementation of Karney's solution to this problem you can download it here: http://seanelvidge.com/wp-content/uploads/2013/04/inverse_ge odesic.pro

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Subject: Re: Finding distance with longitude and latitude
Posted by gpeterso on Tue, 16 Apr 2013 15:46:27 GMT
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On Sunday, April 14, 2013 4:57:14 PM UTC-7, David Fanning wrote:
> gpeterso@ucsc.edu writes:
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> --
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> David Fanning, Ph.D.
>
> Fanning Software Consulting, Inc.
>
> Coyote's Guide to IDL Programming: http://www.idlcoyote.com/
>
> Sepore ma de ni thue. ("Perhaps thou speakest truth.")

Thanks david, would you have any idea how to use the newfound distance to then graph the contour profile with?

Subject: Re: Finding distance with longitude and latitude
Posted by David Fanning on Tue, 16 Apr 2013 16:23:15 GMT
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gpeterso@ucsc.edu writes:

> Thanks david, would you have any idea how to use the newfound distance to then graph the contour profile with?

Well, to be honest, I don't think I care about the distance at all if "graphing" the contour profile is what I am after. Maybe I would use it to label the graph.

I would probably display the great circle distance on the map by just putting the profile on the map with cgPlotS, using the latitude and longitude values you calculated, perhaps color coded with elevation values. If I wanted to show more detail, I might add a plot of the contour values at your profile locations just above the map.

I would also never write this program so that it has to use the Cursor command. I'd write it as a widget program. This would make things *so much* easier when you wanted to display the map and the contour profile together in the same window. You could toggle between the map and the map with contour profile, allow the user to draw multiple contour profiles, and just generally have a LOT more control over what is happening in your program. :-)

Cheers,

David

--
David Fanning, Ph.D.
Fanning Software Consulting, Inc.
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Sepore ma de ni thue. ("Perhaps thou speakest truth.")