Subject: Re: Function Maximum
Posted by James Kuyper on Thu, 19 Jun 2003 17:10:01 GMT
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Craig Markwardt wrote:
>
> James Kuyper <kuyper@saicmodis.com> writes:
>
>> Benjamin Panter wrote:
>> ...
>>> An inelegant solution that might work is to evaluate the funtion in the
>>> range of interest to as high a precision as is computationally possible
>>> - and then run MAX() on it - but there must be a nicer way? I think this
>>> method will fall down if there is a very sharp global max but a wider
>>> local max
>>>
>>> Apologies for not being much of a mathematician and failing to provide a
>>> better way!
>>
>> Actually, for an arbitrary function, the method you describe is the only
>> method that is absolutely guaranteed to find the true maximum value. Any
>> method that is faster than that one is based upon assumptions about the
>> function, such as the assumption that it is reasonably smooth.
>
> Even the brute force method described above assumes that the function
> is smooth enough that it doesn't vary in between grid samples. For
> example, a finite sum of delta functions at random positions would
> probably be missed by any approach.

I was assuming that the grid samples would consist of every distinguishable floating point number within the domain over which you want to find the maximum. In a certain practical sense, a computer function is meaningfully defined only at those sample points. Still, the computer function is usually meant to be a discrete approximation of an abstract mathematical function; the abstract function might have a maximum that isn't represented correctly in the discrete approximation.