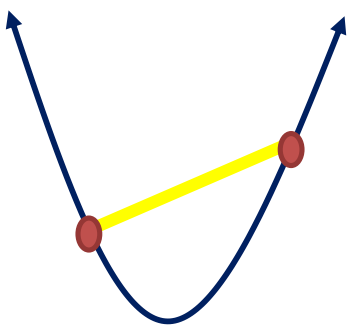
Finding a Local Minimum

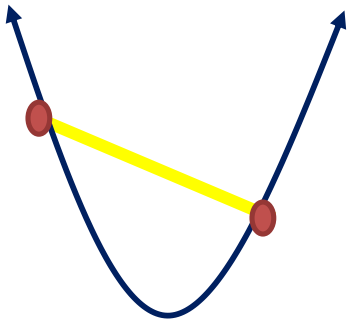
Method 3: Slopes

The Premise

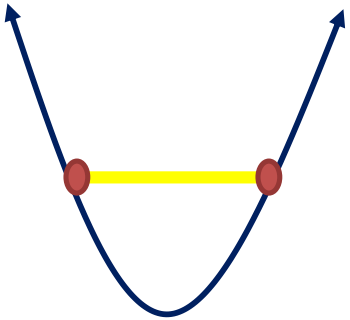
Suppose you know the endpoints of an interval containing a minimum value. You can find the slope between the two points.



Slope is positive



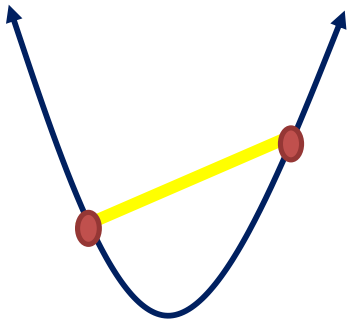
Slope is negative



Slope is zero

The Premise

The slope doesn't tell us much about the minimum, but it does tell us about the endpoints.

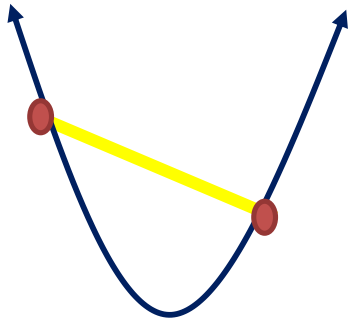


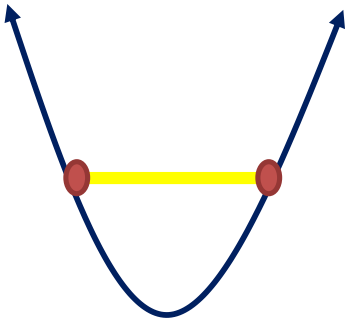
Slope is positive

If the slope is positive, the right endpoint is too far to the right and should be shifted a little to the left.

The Premise

If the slope is negative, we need to shift the left endpoint to the right.





If the slope is zero, the minimum is probably around the middle of the interval.

Your Task

Write a program that, given the endpoints of an interval containing the minimum, uses slope information to narrow the interval until the width of the interval is less than 0.0001.

Test your code!

Save this program!
Document your code!