**Assignment 2 - 1930026143**

1. We know that and .

For Exhaustive Search Method:

Thus, there are 80 function values at least should be calculated in this case.

For Golden Section Method:

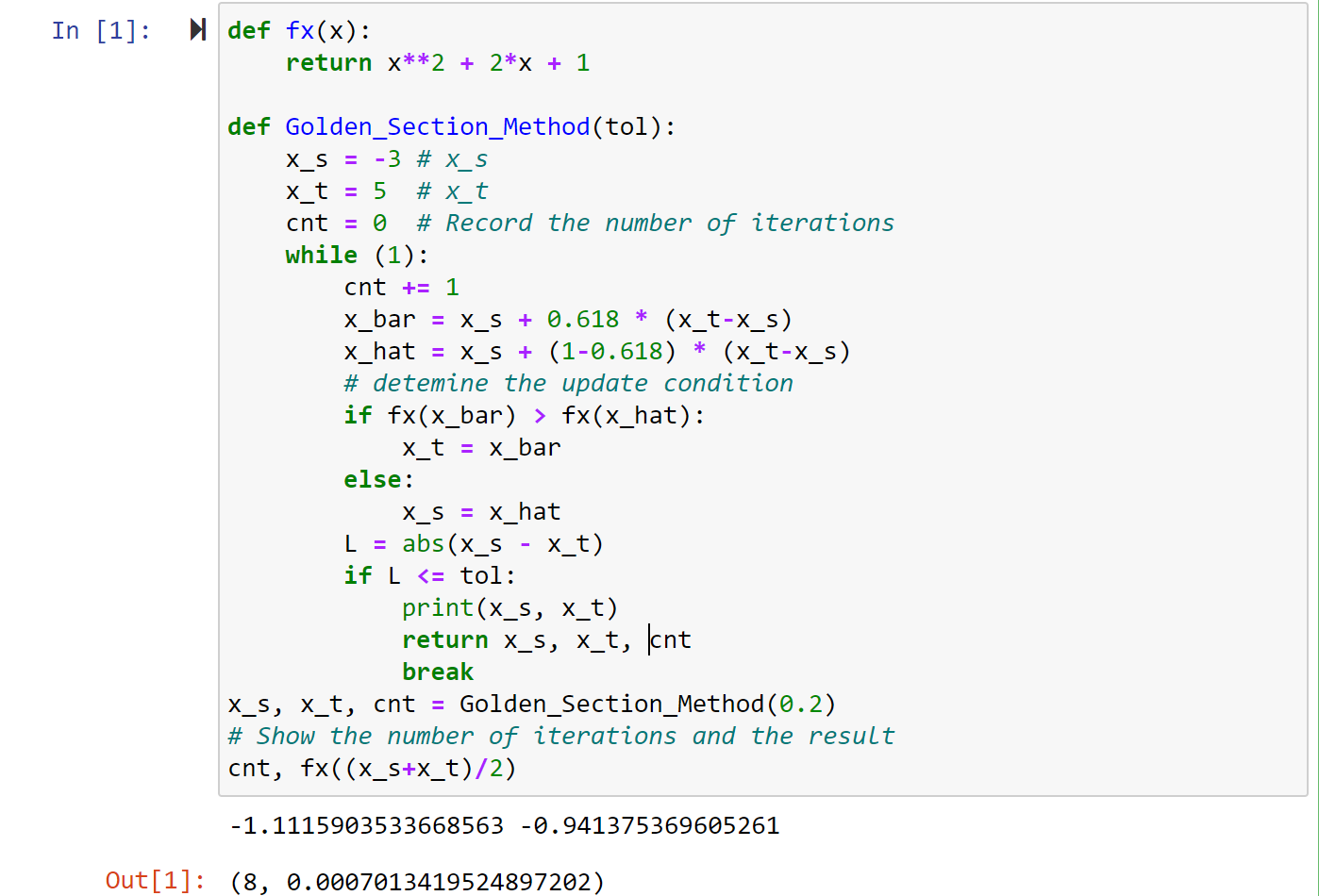
After computing, we can get . Since must be an integer, there are 8 function values at least should be calculated in this case.

1. . We can calculate and determine the case step by step.

Step1:

Since , the interval , which means that .

According to the question (1), there are have 8 steps in the case that the length of the final interval of uncertainty needs to be less than 0.2. So we can solve this problem by coding:



As we can see that the final interval is and there are 8 function values at least should be calculated. And the minimum point of function is 0.0070134.

1. Let , we should minimize it by using the Newton’s Method, which means that we should transform the “find the minimum problem” to “Zero problem” by the first derivative. and .

According to Newton’s Method, value update formula as follow:

In this case, ,

Step1:

,

Step2:

,

Step3:

.

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According to Newton’s Method, value update formula as follow:

In this case, , .

1:

2:

3:

1. We know that the general term , so .

Thus, when we have:

Therefore, the general term is linear convergence and the order of convergence is 1.

(b) We know that the general term with the .

In this case, it is difficult to find the limit of . But we know that as goes to infinity, tends to the smallest. Since we can

which has the minimum point when . Thus and let , we have

Therefore, the convergence is quadratic and the order of convergence is 2.

1. We know that the sequence where converges to with order and . For sequence , it satisfies:

Thus, we have:

which means that for the sequence , the order of convergence of it is also equal to then it can converge.