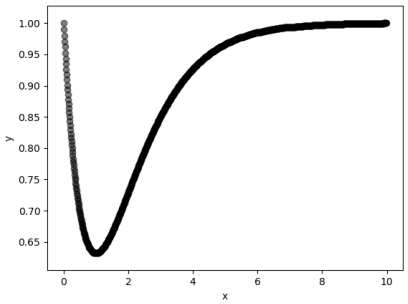
Homework2

Use gradient descent to find the minimum point on the line $f(x) = 1 - xe^{-x}$



Basic Requirement

1. Choose an arbitrary point (x, y).
2. Find the minimum point (x^*, y^*).
3. You must use gradient descent.

Tip

1. Set an arbitrary point $x = 8$.
2. At each iteration, update the position until you arrive the minimum point.

$$dx = -\varepsilon \frac{\partial f}{\partial x}$$

$$x' = x + dx$$

3. The ε is the learning rate which is a very small positive real number $\varepsilon = 0.02$.

$$0 < \varepsilon < 1$$

4. Set the max number of iterations to 30000. If the iteration is bigger than the max iteration number, stop program and get the point as the minimum point (x^*, y^*).
5. $f'(x) = -e^{-x} + xe^{-x}$

Program Requirement

1. If you use some program libraries which contain the algorithm logic about the homework, your score will be a lower than others.
2. Please attaching a readme.doc file which describes the progam langauge you used, e.g. the name, the version, the enviroment, the IDE etc.

Attaching .zip file

1. The program file (if more than one, put them in a folder).
2. A readme.doc file which describes the progam langauge you used.
3. A homework2.doc file which must contain the program execution screenshot and a

simple description of your implementation.

4. Compress above 3 items into a ZIP file using the same name as your student NO. Upload this compressed file to Moodle.

Notice

The score is based on the degree of your program implementation which written by yourself.