Math of AI (2023)

Assignment I

Shiraz University

Due date: 10 Nov (2023)

For this assignment, it is your task to find the minimum of the maximum of a set of affine functions. Firstly, you will have to generate a set of affine functions for yourself as a test case and then attempt to find the minimum of the maximum of these functions. This problem is also referred to as Minmax in Artificial Intelligence. The best solution of this problem is in linear-time complexity. The last runner problem in the following paper may help you:

Moosavi, M. R., ZOLGHADRI, J. M., Ghodratnama, S., Taheri, M., & Sadreddini, M. H. (2012). A Cost sensitive learning method to tune the nearest neighbour for intrusion detection.

Which can be downloaded from here.

Evaluation:

- A number of test cases containing different affine functions will be given to your program. The precision of output and time complexity of the algorithm will determine your score.
- Quality and readability of your code and the clarity of your report is also taken into account.

Submission Guidelines:

- Allowed programming languages: Python, MATLAB
- Your reports should be in a PDF file including: Explanation of the optimization approach, key points of your implementation, and report of your final results.
- You should upload your submissions at Quera. All of the files should be saved in a ZIP file named in this format: “Lastname-SudentNumber.zip”.
  Ex.: “Zamani-4023040.zip”