Introduction to Programming and Data Structures

Breaking the Ice

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Let's play a game!!!

Suppose you are playing a game in turn with the computer. Total n number of sticks are to be picked up in this game. Whoever picks the last one loses the game. Neither the computer nor you can pick up more than 3 sticks at a time. Nobody can skip a turn, i.e. at least one stick is to be picked up in a turn. Write a program to ensure that the computer wins optimally (whenever there is a chance) irrespective of the turn.

What we learnt?

Solving a problem on a computer requires:

1. Understanding the logical actions (strategies) to take.
2. Choosing the best strategy.
3. Finding out the best implementation of the chosen strategy.

Topics to be covered

- Basics
- Programming in Python
- Data Structures in Python
- Analytics in Python

Course Webpage

https://www.isical.ac.in/~malaybhattacharyya/Courses/In2ProgDS/Fall2023

Resources

Books

1. D. E. Knuth, The Art of Computer Programming, Volumes 1-4, Pearson Education.
2. R. G. Dromey, How to Solve it by Computer, Pearson Education.
3. Mark Lutz, Learning Python, O'Reilly.
4. Michael T. Goodrich, Roberto Tamassia and Michael H. Goldwasser, Data Structures and Algorithms in Python, Wiley.
5. T. H. Cormen, C. E. Leiserson, R. L. Rivest and C. Stein, Introduction to Algorithms, MIT Press.
6. Alfred V. Aho, John E. Hopcroft and Jeffrey D. Ullman, Data Structures and Algorithms, Pearson.
7. E. Horowitz and S. Sahni, Fundamentals of Data Structures, Universities Press.
8. T. A. Standish, Data Structure Techniques, Addison Wesley.
9. Wes McKinney, Python for Data Analysis, O'Reilly.

Evaluation

- MID-SEMESTER - 30
- SEMESTER - 50
- ASSIGNMENT - 10 (Scribe + Programming Test)
- PROJECT - 10

Hometasks

- Open an account on GitHub – You need to keep your codes in a repository
- Open an account on Overleaf – You need to scribe for this course