Lecture 0: Administrivia/Introduction

BT 3051 – Data Structures and Algorithms for Biology

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Logistics

Lectures:	**D Slot**, Mondays (11:00), Tuesdays (10:00)
Labs:	**D Slot**, Wednesdays (09:00), Thursdays (13:00)[a]
Venue:	BT 108
E-mail:	kraman @ iitm·ac·in
Office:	BT 104
Office hours:	By appointment
Teaching Assistants:	Aarthi R (bt13d031@smail)
	Aditya Pratapa (bt13s005@smail)
Piazza:	http://piazza.com/iitm.ac.in/fall2014/bt3051

[a] Bring your laptops!

Piazza (experiment!)

- This term, we will be using Piazza for class discussion
- The system is highly catered to getting you help fast and efficiently from classmates, the TAs, and myself
  - Piazza is of course the anti-thesis of RG!
- Rather than emailing questions to me/TAs, I encourage you to post your questions on Piazza
- In fact, every question you ask me after class, I would encourage you to post it on Piazza for the benefit of your classmates
- Class page: https://piazza.com/iitm.ac.in/fall2014/bt3051/home
- If you have any problems or feedback for the developers, email team@piazza.com

Course Objectives

- Introduce you to basic algorithms (methods for problem solving)
- Introduce elementary data structures (methods for storing information)
- Improve your programming skills (learn good programming practices)
- Study algorithms and data structures of importance in biology

Course Objectives

At the end of the course, it is expected that you will

- have a good understanding of basic algorithms/data structures
- understand and apply general computational techniques such as dynamic programming/randomisation/...
- be able to develop algorithms and data structures to solve biological problems
- ... and write and test correct and readable programs!
- inculcate professionalism

Coursework and Grading

- Attendance to the lectures is required; late-comers will be marked absent
- Weightage:
  - Quizzes I/II/Pop: 30%
  - Homework: 30%
  - End-semester exam: 40%
- Some homework may be assigned in pairs
- Class participation (incl. on Piazza online) will also carry weightage (≈bonus)

Coursework and Grading

Academic Integrity Policy

- Obviously, NO COPYING, in homework or tests
- Collaboration on homework (informal discussions) is permitted
- No sharing of code or looking at others' codes (even on the web)
- Copying from the Web is also NOT permitted (Use piazza instead of stackoverflow!)
- Offenders will be penalised severely

Assignments

- Practically all assignments will involve coding a program to solve a problem
- I intend to also hand out many self-assessment homework problems
  - Won't grade them
  - Encourage discussion on piazza
  - Opportunity to learn, discuss (and increase course participation points!)
  - Of course, solving them will help you perform better!
  - Some quiz questions will be based on self-assessment problems

Classroom decorum/etiquette

- A major part of professional education is to inculcate professionalism!
- Be punctual to classes; 100% attendance is encouraged (may include prizes :-))
  - Inform me *a priori* if you know you will miss a class
- I strongly encourage classroom discussion
  - Feel free to stop me at any time and raise doubts
  - But avoid consulting your friends during class
  - Chances are someone else has the same doubt and is keeping quiet
- No mobile phone/tablet use (disable notifications and keep off person, ideally)
- Laptops will be permitted in certain classes
- I encourage handwritten notes
  - May come handy in an open-notes pop quiz!

Important Dates

Date	Day	Time	Event
9-Sep-14	Tue	08:00	Quiz I
16-Sep-14	Tue	10:00	Mid-term feedback
16-Oct-14	Thu	08:00	Quiz II
10-Nov-14	Mon	11:00	Final feedback/TCF
24-Nov-14	Mon	09:00	End-semester Exam

How to succeed in this course?

- Be regular to classes
  - If you miss a class, sync with your classmates before the next class!
- Submit assignments promptly
  - Start working early! Start a draft version to reduce E_a!
- Study regularly
  - Clichéd as it may sound, it will save you time through the semester!
- Have fun!
  - Try to see the algorithms around you!

Reading/Resources

Many excellent textbooks on algorithms:

- **Gries P et al.** (2013) *Practical Programming: An Introduction to Computer Science Using Python 3 (Pragmatic Programmers)*. Pragmatic Bookshelf, 2/e. ISBN 9789351104698
- **Jones NJ & Pevzner PA** (2009) *Introduction to Bioinformatics Algorithms*. ANE Books. ISBN 8180520781
- **Guttag JV** (2013) *Introduction to Computation and Programming Using Python*. The MIT Press, revised and expanded edition/e. ISBN 0262525003
- **Cormen TH** (2010) *Introduction to algorithms*. PHI Learning. ISBN 9788120340077
- **Skiena SS** (2010) *The Algorithm Design Manual*. Springer, softcover reprint of hardcover 2nd ed. 2008/e. ISBN 1849967202
- **Heineman GT & Pollice G** (2008) *Algorithms in a Nutshell*. Shroff Publishers & Distributors Pvt Ltd. ISBN 8184046081

Reading/Resources

- But none explicitly for biology!
- We will draw from various sources through the course
- Many useful online courses too
- Python will be the language of choice in the course
- codeskulptor.org

Questions?

"Any idea or problem or body of knowledge can be presented in a form simple enough so that any particular learner can understand it in a recognizable form."

— Jerome Bruner (1915–)

http://psych.nyu.edu/bruner

Questions?

Also remember