15-112 Fundamentals of Programming

Lecture 1

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Introductions

- Tell me about yourself
  - What is your name?
  - Do you have any programming experience?
  - What is something unique about you?
- To break the ice, I will be the first to start

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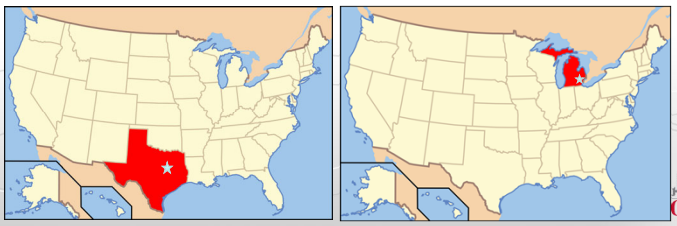
Who am I?

- Saquib Razak
  - Associate Teaching Professor
- Education:
  - BS in Electrical Engineering – University of Texas, Austin
  - MS in Electrical Engineering – University of Texas, Austin
  - Ph.D. in Computer Science – State University of New York
- Programming Experience
  - Senior Software Engineer – Motorola Inc. 1996 – 2001 (Fort Worth, Texas)
    2001 – 2004 (Farmington Hills, Michigan)



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What is Programming?

- Programming is like solving a puzzle
- Given a problem, determine what needs to be done in order to solve the problem
- The job of a programmer is to decompose a task into ordered steps which can be executed by a computer
  - Must know what operations a computer can perform

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What is Programming?

- A computer program is just a set of instructions for a computer
- A programming language is a language that allows us to communicate with the computer in order to give it instructions

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Programming vs Computer Science

- What is the difference between Programming and Computer Science?

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The Programming Process

1. Understand the Problem
2. Plan the Logic
3. Code the Logic : Write a Computer Program
4. Translate Program into Machine Language
5. Run & Test the Program

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Language Syntax

- Programming languages have special syntax that you must follow when you write code.
  - Syntax is the rules about how statements are written and how commands are spelled
  - The computer does not understand your code unless the syntax is perfect

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In this course….

- You'll be assigned problems
  - You'll need to make sure you understand the problem and what is expected of you
- You'll need to plan the logic on how to solve these problems
- You'll need to code the logic in the Python Programming Language
- You'll need to execute the programs and test your solution

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At the End!

- Students completing this course will be well positioned to:
  - Discuss the major aspects of a computer program and how computers solve problems.
  - Implement small programs to solve well-defined problems.
  - Able to develop programming and computer science skills based on these materials and successfully take and complete 15-122 Principles of Imperative Computation.

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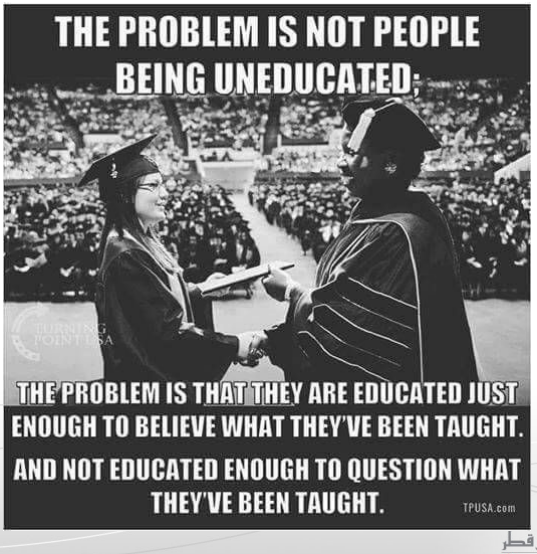
The focus in this course



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Python

- Python3 vs Python2
- We will be using Python3
- Python is an interpreted language
- Download from python.org

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Student Background

This course is designed for students who have no programming experience.

If you have programmed before, then the first three to four weeks of the course will be review or refresher.

Once we get into applications part of the semester, things should get exciting for you.

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Course Syllabus

- Let's go through the course website

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Course elements

- Total 1000 points
  - Quizzes (11 – Drop 1) — 100 points
  - Midterm 1 — 100 points
  - Midterm 2 — 100 points
  - Final — 180 points
  - Programming Assignments — 350 points
  - Project — 100 points
  - Participation — 70 points
    - Attendance — 30 points (-3 for each absence)
    - CA Discussions/Exercises — 40 points (5 points worth of oral quiz/meeting)

338 from 520 + ↓

- You have to get a grade of at least 65% (325 points) from Exams and Quizzes to get a grade of C or better
- You must receive a 55% or higher on in-class assessments in order to receive a D or higher in the course.

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Course ground rules

- Be respectful of the learning environment
  - Come to class and be on time
  - No private conversations
  - No cell phones; use mute and don't use them
  - Do not use computers unless it is for exercises/labs
  - Bring a supply of paper and pens/pencils
  - Do the readings before class and be prepared
- We start at 1:30pm. No one allowed in class after that!

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Times

- Class times:
  - Sunday, Tuesday, and Thursday
    - 1:30pm to 2:50pm – Room 1190
- Weekly Quiz: Thursdays

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Professor Saquib's Office Hours

- Office: 1018
- Office Hours: Sun, Tue: 10am-11am
- Website: http://www.qatar.cmu.edu/~srazak/
- Email: srazak@cmu.edu

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Support

- CAs:
  - Laila El-Beheiry
  - Nour Ali
  - Aman Haris
  - Ammar Karkour
  - Mohammed Al-Jawaheri

  (Office hours will be announced on Piazza)

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Course Website

- https://www.cs.cmu.edu/~112q
- Piazza for class-related discussion :
  - Ask questions on piazza
  - I may not be up at 3am but your peers or TAs might be
  - Common questions can be answered once
  - If you have a question, check piazza to see if it has already been answered
  - Actively participate in online discussions
  - DO NOT post your code on piazza. If you have specific questions about your code email me at: srazak@cmu.edu

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Getting Help

- If it's graded work:
  - Faculty and course staff can help
  - No one else should see your work.
  - If you are repeating this course, you cannot reuse your code from previous semesters

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Policy on Tutors

- If you have an outside tutor you may use them for any of the following:
  - Help studying for quizzes.
  - Help studying for exams.
  - General help with learning to program and problem solve.
- Use of tutor in any other way is a violation of this academic honesty policy. This includes, but is not limited to, the following:
  - Help with the homework in any way. (Including any and all discussion of it.)

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Regret Period

- Sometimes people make mistakes. Sometimes they regret them. We've all done stupid things and wished we could take them back.

"If you commit an academic integrity violation on the homework, but bring it to the attention of the course instructors and have an open and frank discussion about it within 48 hours of your submission, we will allow you to withdraw the submission with no further action taken beyond that. An individual student may invoke this policy at most once during the course."

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Getting Help from CA

- When you go to the CA, you should be able to answer three questions
  - What is the homework problem?
  - How are you solving the problem?
  - What is your code doing?
  - How have you tested it?

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Homework and online resources

Sharing….

- Concepts and background facts are OK
- Answers to problems/source code are not.
- If you're not sure, *ask an instructor before you use the resource*

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Alice and Bob

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Alice and Bob

Bob: *Hey Alice, let me see your answers to the homework.*

Alice: *Here you go!*

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Alice and Bob

Alice: *Hey Bob, I see you're having trouble with your program, let me see if I can help you find your bug*

Bob: *Oh thanks!*

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Alice and Bob

Alice: *Hey Bob, I didn't quite understand chapter 3. Can we spend some time studying together for the quiz?*

Bob: *Definitely!*

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Alice and Bob

Bob: *Gee Alice, I've finished the homework and I know you did too, did you want to compare answers to check our work?*

Alice: *Sounds good to me!*

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Alice and Bob

Alice: *Hey Bob, you're a sophomore so you're not in my class, can you help me figure out how to do this homework?*

Bob: *Let's talk about it!*

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Alice and Bob

Bob: *Hey Alice, you're a sophomore so you're not in my class, can you help me figure out how to do this homework?*

Alice: *Let's take a look at what you've written!*

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Alice and Bob

Bob: *Hmm...this homework problem requires me to know the average velocity of a bird to be able to solve the problem. I'll go look it up on Wikipedia.*

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Alice and Bob

Alice: *I found this nifty program online which almost solves one of the homework problems. I'm not going to copy it, but I'll use it as a reference when writing my own solution*

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General Advice

- Leave yourself time to get help if you need it
  - Start homework early!
- Don't be afraid to get help!
  - Just be sure it's from an appropriate source
- Protect yourself
  - Don't leave yourself logged in to cluster machines
  - Don't leave printouts of your homework around

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