

15-112 Fundamentals of Programming

Lecture 1
August 25 , 2019

جامعة كارنيجي ميلون في قطر
Carnegie Mellon Qatar

Introductions

- Tell me about yourself
 - What is your name?
 - What is the name/city/country of your high school?
 - 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

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

Programming vs Computer Science

- ❑ What is the difference between Programming and Computer Science?

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

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

In this course....

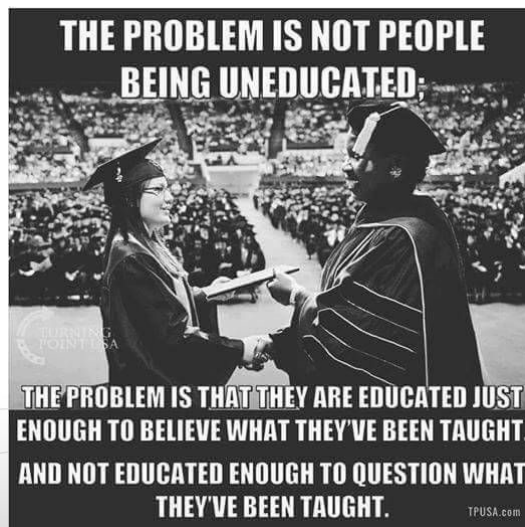
- ❑ You'll be assigned problems
 - You'll need to make sure you understand the problem and what is expected of you
- ❑ You'll need to plan the logic on how to solve these problems
- ❑ You'll need to code the logic in the Python Programming Language
- ❑ You'll need to execute the programs and test your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

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.

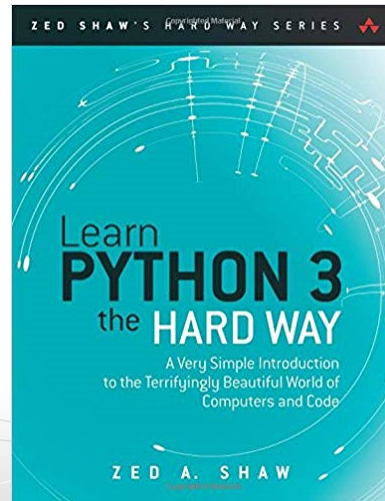
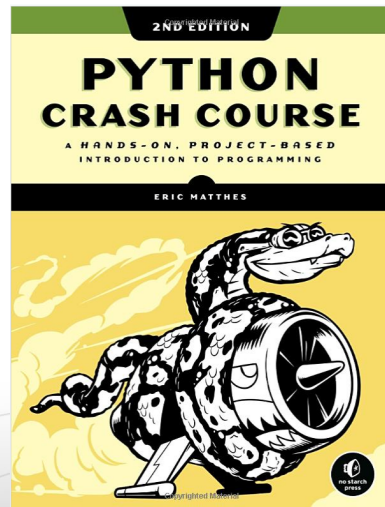
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The focus in this course



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Textbooks



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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 elements

- ❑ Total 1000 points
 - ❑ Quizzes (8-10) 100 points
 - ❑ Midterm 1 100 points
 - ❑ Midterm 2 100 points
 - ❑ Final 200 points
 } 325 from 500
 - ❑ Programming Assignments 350 points
 - ❑ Project 100 points
 - ❑ Participation 50 points
 - ❑ Attendance 20 points (-3 for each absence)
 - ❑ CA Discussions/Exercises 30 points (-5 for each missed appointment)
- ❑ You have to get a grade of at least 65% (325 points) from Exams and Quizzes to get a grade of C or better (passing grade)

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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

Times

- Class times:
 - Sunday, Tuesday, and Thursday
 - 1:30pm to 2:50pm – Room 2035
- Weekly Quiz: Thursdays

Professor Saquib's Office Hours

- ❑ Office: 1018
- ❑ Office Hours: Check Piazza
- ❑ Website:
<http://www.qatar.cmu.edu/~srazak/>
- ❑ Email:
srazak@cmu.edu

Support

- ❑ CA:
 - Maimoon Siddiqui
 - Mohammed Yusuf Ansari
 - Omar Sinan
 - Nadim Bou Alwan
 (Office hours will be announced on Piazza)
- ❑ Academic Resource Center
 - Mariamma Thomas < mariamma@qatar.cmu.edu >

Course Website

- ❑ www.qatar.cmu.edu/~srazak/courses/15112-f19/
- ❑ 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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Reading Assignment

- ❑ Read the lecture notes on “python language basics” from the course website

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Getting Help

- ❑ If it's graded work:
 - Faculty and staff tutors can help
 - TA's can help on paper
 - No one else should see your work.

Getting Help from CA

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

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!*

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!*

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!*

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!*

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!*

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!*

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.*

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*

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