CompSci 101
Introduction to Computer Science

Sept 13, 2016

Prof. Rodger

Announcements

- Reading and RQ5 due next time
- Assignment 2 due Thursday
- APT 1 is due today, APT 2 out today
- Catch up Schedule on main web page

- Today –
  - Solving problems – 7 Step process
  - Decisions - if, Boolean

How many ways can I run Python in this course?

- Eclipse
  - Complete program
  - Interactive Console
  - APT
- Online textbook
  - Beware Python 3 ('/' (2.7) vs '//' (3))
- Python Tutor

How to get Help in this class

- Piazza

- Consulting hours (Sunday-Thursday nights)

- Office hours (Prof, TAs)

- What happens if my laptop breaks and I can't use my eclipse? Do I stop programming?
  - Clusters, Python Tutor, websubmit, borrow

  - Fill out form to request extension

Submitting an APT – APT tab

- Test – get it working
- Submit – run it one time here and see the green
- Finish – complete README for each APT

- Check your grade – "check submissions" link

Submitting Assignment 2

- Use Ambient/eclipse
  - Check if submitted with Submit History – files submitted should be listed!
  - Alternative submit – use websubmit – on assign tab
  - What time is it due? Thursday 11:59pm + 121 minutes
  - If you can't submit on your computer, copy your file to another computer (Link?) and submit with websubmit on that computer

Completing and Turning in Lab

- Lab is due Sunday night following lab
- You should complete it (unless items marked optional)
- If you miss lab you still need to do it and turn it in – max 3 of 4 points
- Ok to miss a few labs, I'll drop a few lab points at end of semester

Lab this week

- Always **read the reading** for the week **before lab**
- String splicing
  - Word = "go duke"
  - print word[3:5] + word[0]
- Making decisions – if
- Lists – ["orange", "kiwi", "lemon"]

Why is this person so important to this course?

Review Functions

www.bit.ly/101f16-0913-1

```python
def duplicate(word, num):
    answer = word * num
    return answer


def duplicate2(word, num):
    answer = word * num
    print answer


def duplicate3(word,num):
    answer = word * num
```

```python
1. print duplicate ("Go", 3)
2. print duplicate2("Go", 5)
3. print duplicate3("Go", 2)
4. duplicate("Go", 5)
5. duplicate2("Go", 4)
6. duplicate3("Go", 2)
```

Use Python Tutor

- Debug/trace your code
- Doesn't work with input files

Assignment 2

- Questions?

- Demo

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Grace Murray Hopper (1906-1992)

- "third programmer on world's first large-scale digital computer"
  - US Navy: Admiral

"It's better to show that something can be done and apologize for not asking permission, than to try to persuade the powers that be at the beginning"

https://www.youtube.com/watch?v=1-vcErOPofQ

- **ACM Hopper award given for contributions before 35**
  2010: Craig Gentry: http://www.youtube.com/watch?v=qe-zmHoPW30
  2011: Luis von Ahn
  2013: Pedro Felzenszwab
  2014: Sylvia Ratnasamy
  2015: Brent Waters

APT Pancake:
http://bit.ly/pancakes101

- How do you solve this problem?
  - First steps: are there simple cases that can be solved immediately?
    - What are these for the pancake problem?
  - Sometimes it helps to know if you are on track, should you use Python to check your paper and pencil work?
- Get specific, solve for 5, not N
  - Fix one parameter, vary the other
  - Identify the cases and continue

Solve an APT - Pancakes
bit.ly/101f16-0913-2

Problem Solving to Code
7 Step Process

1. Work small examples by hand

2. Write down what you did in words (algorithm)

3. Find Patterns (generalize algorithm)

4. Work another example by hand (does your algorithm work? If not, go back to 2)

5. Translate to code

6. Test several cases

7. Debug failed test cases

Pancake Problem

- Work through the 7 step process….

How to solve problems with different cases?

- Keep score in a video game?
  - Different points for different tasks?
- Translate a book from English to Spanish?
  - Different words, different rules
- Identify proteins in strands of DNA?
  - Start codon: atg   Stop Codon: tag
- Different cases with Pancake APT?

- In Python use: if, else ,elif

How to teach pancake Flipping

- http://www.youtube.com/watch?v=W_gxLKSsSIE
  - Is this computer science? http://bit.ly/zykOrh
  - For longer, more complex robotic tasks
    - http://www.youtube.com/watch?v=4usoE981e7I