CS177 Python Programming

Recitation 1 – Introduction
Course Instructors

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Website

- http://courses.cs.purdue.edu/cs17700:fall14:start

- Class notes, labs and projects will be posted there.
Course Structure

• Lecture 2 times a week
• Recitation once a week.
• Lab once a week.
• We will take attendance
Textbook

## Grade Distribution

<table>
<thead>
<tr>
<th>Item</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Midterms</td>
<td>25%</td>
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<tr>
<td>Laboratories</td>
<td>25%</td>
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<tr>
<td>Projects</td>
<td>25%</td>
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<tr>
<td>Final Exam</td>
<td>20%</td>
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<tr>
<td>Attendance/Quizzes</td>
<td>5%</td>
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What do you need?

- Download Python (highly recommended) [https://www.python.org/download](https://www.python.org/download)
- iClicker – Register on Blackboard Learn
- Piazza – Sign up by visiting [CS17700 on Piazza](https://piazza.com/class/57707).
Objectives

• Programming in Python
• Learn basic Computer Science concepts
• Design software
What is a Computer Program

• What is a computer program?
  – A detailed, step-by-step set of instructions telling a computer what to do.
  – If we change the program, the computer performs a different set of actions or a different task.
  – The machine stays the same, but the program changes!
Algorithms

- **Algorithms** are the main focus
  - Algorithms formally describe computational processes
  - Programs embody algorithms

Note: *An algorithm is independent of how a program implements it*
Algorithm Example

1. Remove book from bag
2. Place book on desk
3. Open book to first page

Step 4 contains a few complexities. *Until* suggests that there is some repetition and *Read* could represent an algorithm also
Algorithms and .....recipes

• You are hungry, so you want to eat something. You decide to make a two egg omelet.

• What do you need to do to make a two egg omelet? Let’s see...
Egg Omelet

How to make an egg omelet:
1. Put oil in pan
2. Pre-heat pan
3. Crack eggs into bowl
4. Add Salt
5. Wisk the contents of bowl
6. Pour contents of bowl into pan
7. Wait for 3 minutes
Anything in common?

- Do you see something in common between reading a book, say the CS177 textbook and making an omelet?
- What a strange idea! Comparing the reading of a book with making an omelet
- Look more carefully…Ask yourself some questions ….
Some questions

• Why did you decide to read (study) the CS177 textbook?
  – Answer(s):
    • Because you want to pass the course
    • Because you do not remember what was said in the lesson
    • ....
Some questions

• Why did you decide to make an omelets?
  – Answer(s):
    • Because by eating the omelets you can tackle your hunger
    • ....
What is in common?

• In both cases, reading the textbook solves a problem

• To solve a problem, you must perform a certain (finite!) number of different steps, usually one after another
Pseudo-code

- Pseudocode is an artificial and informal language that helps programmers develop algorithms.
- Pseudocode is a "text-based" detail (algorithmic) design tool.
Pass or Fail

If student's grade is greater than or equal to 60
    Print "passed"
else
    Print "failed"
Class Average

Set total to zero
Set grade counter to one
While grade counter is less than or equal to ten
    Input the next grade
    Add the grade into the total
Set the class average to the total divided by ten
Print the class average.
Using python

• Go to Start > Search “python”
• Click on IDLE (Python GUI)
• First window opens
• Click File > New Window
• Second window open
• Always write code in this window
• Don’t forget to save
What can python do?

• Simple calculations
  >>> a=5
  >>> b=4
  >>> 4=x (WRONG)
  >>> c=a+b
  >>> c
  9

• Print Statement
  >>> print(“Hi”)
  Hi
  >>> print(c)
  9
  >>> print(a,c)
  5 9
Let's write a simple program

# by Vignesh Gouthaman
# This program calculates sum of 2 numbers

```python
def main():
    a = 4
    b = 5
    c = a + b
    print(a, "+", b, "=", c)
main()
```

Output

```plaintext
>>>4 + 5 = 9
```