CompSci 101
Main, Functions, Import, Random, Conditionals

Announcements
• Upcoming due dates
  • Sakai quizzes 1-4: 2/4 @145pm.
  • All future quizzes due @145pm day of lecture
• Assignment 0-TODAY @1130pm
• Assignment 1-released today (due 2/11 @1130pm)
• Last day to register (TODAY)-can’t change labs without permission #
  • https://www.cs.duke.edu/undergrad/registration
• Consulting hours vs. office hours
• Piazza channel

D is for ...
• Design
  • Great programs are the result of great designs. (KISS principle)
• Decomposition
  • Breaking down a problem/task into smaller subproblems/subtasks
• Debugging
  • A key skill in making your programs run
• Data (Science)
  • Creating information from 0’s and 1’s

Computer Scientists to Know
• Dr. Mark Dean
  • Dean of Engineering, University of Tennessee
  • Former chief engineer (IBM)
• Mrs. Angie Jones
  • Principal Automation Architect
  • Applitools (Test Automation Univ)
  • Master Inventor-25 patents
PFTD

- Main
- Functions
- Import
- Conditionals

- “The mere imparting of information is not education.”  
  - Dr. Carter G. Woodson

Why do we need this statement?

```python
Created 1/25/2021
@author: anw
```n
```python
if __name__ == '__main__':
```


```python
if __name__ == '__main__':
    name = 'Jeff'
    hours = 15
    rate = 15

    # Calculate and output total pay
    totalPay = hours * rate
    print("Total Pay for " + name + "=$" + str(totalPay))
```n

Functions-Why Do We Need Them?

```python
if __name__ == '__main__':
    name = 'Jeff'
    hours = 15
    rate = 15

    # Calculate and output total pay
    totalPay = hours * rate
    print("Total Pay for " + name + "=$" + str(totalPay))
```n
What’s the Difference?

- Easier to
- Read/understand
- Modify
- Test
- Debug

Pro tip: Look for any repetition in your programs

Benefits of Functions

- Easier to
  - Read/understand
  - Modify
  - Test
  - Debug
  - Pro tip: Look for any repetition in your programs

Creating/Using Functions

1. Define the function (How it works)
2. “Call” the function (Using it)

```python
def functionName(parameters):
    block

if __name__ == '__main__':
    variable = functionName(arguments)
```


- Update this program to:
- Create function
  - calculate_pay
    - Calculates/outputs pay for each student
- Use calculate_pay in program to update this program
Why Import??

import module_name

if __name__ == '__main__':
    print(module_name.function_name(arguments))

Python Standard Library
• https://tinyurl.com/kt4ogfu
Programmer-defined modules

Can we only import modules from the Python Standard Library?

• Module named mymodule.py
• Module named test.py
**We want to import mymodule into here and use the output_num function**
• Updated test.py
**Imports mymodule to use output_num function**

Random numbers
• random.random()  
  • Return floating point number in range [0.0, 1.0]
• random.randint(a, b)  
  • Return random integer N such that a <= N <= b
• How would we simulate rolling dice?

• Modify this code to simulate rolling two dice
• Requirements
  • Generate values for two dice
  • Output values of each die
  • Call function output to calculate and output sum of dice
Selection/Conditionals: if...elif...else


- Extending your program from WOTO 3
- Simulate rolling two dice
  - "Roll" two dice
  - Results of the rolls sent to function named `sum`
    - Sum dice values
    - If sum is 7 or 11, then output "You win!"
    - Otherwise, output "Next time!"

Remember

- Work smarter, not harder
- Design first
- Try to identify where you are stuck
  - Identify resources to help solve problem
- Leverage your design and PythonTutor to understand program flow of control
  - http://pythontutor.com