CompSci 101
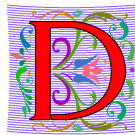## Main, Functions, Import, Random, Conditionals

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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 #
- Consulting hours vs. office hours
- Piazza channel

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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

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Computer Scientists to Know

- Dr. Mark Dean
  - Degrees: Electrical Engineering
    - University of Tennessee, Florida Atlantic University, Stanford University
  - Dean of Engineering, University of Tennessee
  - Former chief engineer (IBM)

- Mrs. Angie Jones
  - Degrees: Computer Science
    - Tennessee State University, NC State University
  - Principal Automation Architect
    - Applitools (Test Automation Univ)
  - Master Inventor-25 patents

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PFTD

- Main
- Functions
- Import
- Conditionals

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Why do we need this statement?

"""
Created 1/25/2021
@author: anw
"""

if _ _name_ _ = = '_ _main_ _':

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WOTO 1: http://bit.ly/101s21-0202-1

```
if _ _name_ _ = = '_ _main_ _':
        name == "Jeff'
        hours = 15
        rate = 15

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

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Functions-Why Do We Need Them?

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What's the Difference?

All the single ladies (all the single ladies)
All the single ladies (all the single ladies)
All the single ladies (all the single ladies)
All the single ladies
Now put your hands up

Up in the club, we just broke up
I'm doing my own little thing
You decided to dip but now you wanna trip
'Cause another brother noticed me
I'm up on him, he up on me
Don't pay him any attention
'Cause I cried my tears
For three good years
Ya can't be mad at me

'Cause (Chorus)if you like it then you should have put a ring on it
If you like it then you should've put a ring on it
Don't be mad once you see that he want it
If you like it then you should've put a ring on it

(Refrain)
Whoa uh oh uh uh oh oh uh oh uh uh oh
Whoa uh oh uh uh oh oh uh oh uh uh oh

Chorus

I got gloss on my lips, a man on my hips
Hold me tighter than my Dereon jeans
Acting up, drink in my cup
I can't care less what you think
I need no permission, did I mention
Don't pay him any attention
'Cause you had your turn
And now you gonna learn
What it really feels like to miss me

'Cause (Chorus)

Refrain

Chorus

Refrain

Benefits of Functions

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

Creating Functions

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

```
def functionName(parameters):
    block
```

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

```
def output(name):
    print(name)

if __name__ == '__main__':
    student1="Keila"
    output(student1)
```

WOTO 2: http://bit.ly/101s21-0202-2

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

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

    totalPay = hours*rate
    print("Total Pay for " + name + "=$" + str(totalPay))

    name = "Sonia"
    hours = 19.5

    totalPay = hours*rate
    print("Total Pay for " + name + "=$" + str(totalPay))
```

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Why Import?? Added Functionality

import *module_name*

```
import math

if __name__ == '__main__':
    print(math.floor(6.3333345))
```

if _ _name_ _ = = '_ _main_ _':
        print(*module_name*.*function_name*(*arguments*))

Python Standard Library
- https://tinyurl.com/kt4ogfu

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Random numbers

- random.random( )
  - Return floating point number in range [0.0, 1.0)

```
import random

def output(value):
    print("Number=" + str(value))

if __name__ == '__main__':
    number = random.random()
    output(number)
```

- random.randint(a, b)
  - Return random integer N such that a <= N <= b

- How would we simulate rolling dice?

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WOTO 3

- Edit this code to simulate rolling two dice
  - Generate values for two dice
  - Output values of each die
  - Use function to calculate sum of dice and output it

```
import random

def output(value):
    print("Number=" + str(value))

if __name__ == '__main__':
    number = random.random()
    output(number)
```

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Conditionals: if...elif...else

- If condition is true→action1
- Or else if new condition is true→action2
- Or else→action3

if *condition1*:
        block1
elif *condition2*:
block2
else:
                block3

```
if __name__ == '__main__':
    num1 = 5

    if num1 == 5:
        print("The number is 5!")
    else:
        if num1 < 5:
            print("The number is less than 5!")
        else:
            print("The number is greater than 5!")
```

```
if __name__ == '__main__':
    num1 = 2

    if num1 == 5:
        print("The number is 5!")
    elif num1 < 5:
        print("The number is less than 5!")
    else:
        print("The number is greater than 5!")
```

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WOTO 4

- Simulate rolling two dice
  - Within the function *sum*
    - Sum dice
    - If sum is 7 or 11 then output "You win!"
    - Otherwise, output "Next time!"

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Can we only import modules from the Python Standard Library?

```
def output_num(value):
    print("The value from your main code was "+str(value))
```

Module named mymodule.py

```
def output(value):
    print("Number=" + str(value))

if __name__ == '__main__':
    number = 20
    output(number)
```

Module named test.py
we want to import mymodule into here and use the output_num function

```
import mymodule

def output(value):
    print("Number=" + str(value))

if __name__ == '__main__':
    number = 20
    output(number)
    mymodule.output_num(number)
```

Updated test.py
imports mymodule to use output_num() function

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Remember

- Work smarter, not harder
- Design first
- Leverage PythonTutor to understand control
  - http://pythontutor.com

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