Introduction Course Guide for Middle School

# Session 1 Introduction - Touching on the topic:

Course Objectives

Guides / Ground rules

Whys and Whats

Blazing Introduction

Just Do It - Run our files

Just enough - IDLE

Just saying... hello\_world.py

Don't be square... square.py, square\_loop.py

Be a star... spokes.py

Some input... some\_input.py

A little dramatics... starry\_night.py

Python vs English

exercises/if\_statement/

exercises/while\_statement/

exercises/for\_statement/

Using IDLE

Basic IDLE

Guessing Game (with at least .5 hour to go

in lecture session of class)

factors\_v1\_b.py

Homework:

presentation/Introduction.../homework

More on samples, if time permits

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Session 2:

Homework Poll

Questions

Programming, Python, Homework

programming ideas

lists append, range

samples/

lists1.py

list\_range.py

spokes\_list.py

saving\_interest.py

functions:

samples/

spokes\_function.py

spokes\_function\_defaults.py

square\_no\_defaults.py

square\_list.py

square\_keywd\_none.py

practice with print() keywords sep, end

samples/

print\_args.py

Program Iterations Slide 48

Help from outside the lecture/class

From IDLE Help Docs:

The Python Tutorial - for more - needn't read all

IDLE: Help->Python Docs->The Python Tutorial

1. Whetting Your Appetite

Skip: 2. Using the Python Interpreter

3. An Informal Introduction to Python

4. More Control Flow Tools

5. Data Structures

lists, tuples,...

The Python Language Reference

- dry but the "final answer"

From Internet:

"Google" python...what you want to know

https://www.w3schools.com/python/

Summary

presentation/shapes\_arround.py

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Session 3: Functions Why and How

poll How was the homework?

(Class 2 Homework - for Twenty Questions Project

Iteration 3:Say if guess is greater, less or equal)

review iteration 2, then work to iteration 3

function summary

samples/

shapes.py - function - points - to lines - to text

Thinking of Iterations - Show progress: Session 2 slide 49

Python import: Session 2 slide 56

Python functions(as well as other) info:

https://www.w3schools.com/python

IDLE->Help->Python Docs(F1)

Python Tutorial:

4.6. Defining Functions

4.7. More on Defining Functions

4.7.2. Keyword Arguments

The Python Language Reference

Functions use: friends\_family

Review list data type

friends\_family/friends\_1.py

friends\_family/friends\_2.py

friends\_family/friends\_3.py

Modules - collection, reuse, testing

friends\_family/friends\_mod.py

friends\_family/friends\_4.py

functions/figures/my\_polygon\_keyw.py

functions/figures/my\_polygon\_keyw\_2.py

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Session 4: Dictionary

go over previous session's homework:

iteration\_4.py - random target

exercises/functions/playing\_cards/cards\_mod.py

do dictionary exercise(s)

trades\_d,...

exercises/dictionaries/dictionary\_1.py

exercises/dictionaries/dictionary\_2.py

do motion.py example

Students should program along

show initial board

Students should play the game - move around

Only got to dictionary

Short start to motion.py

change empty to something their own

e.g. +, " "

change board\_width e.g. 9

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Session 5: Classes

go over previous session's homework:

iteration\_5.py - preamble with range

presentation/.../homework/solutions/move\_to\_goal.py

Style

PEP 20 -- The Zen of Python

PEP 8 -- Style Guide for Python Code

Classes - Programmer Defined Objects / Data Types

Reasons / Usage

Complex data types, Comples Activity

Class / Object Example using turtle

turtle/obj\_multiple.py - several turtles

turtle/obj\_multiple\_2.py - showing object independence

Classes in detail

Creation / Use

Definition

Examples

class Person

definition

code

classes/person\_classes/person.py

class PersonGroup

class Ball2d

class Ball2dTable

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Session 6: Files

go over previous session's homework:

iteration\_6.py - multiple games

Files - Came into use:

1. because computers could not hold all the data

2. data needed to stay after program completed

evolved from physical file cabinets

card decks, punched tape -> magnetic tape, disk -> internet cloud

Early computer work required detailed knowledge of structure

Now - mostly the idea

accessible by name

often created or used by other programs

stays around after program is done

usually linear often only read or write

often for BIG data

Your python programs are examples

created by you with a text editor

used by you via python program compiler

stays around for future access

review

file\_search\_graphical.py - top level search

graphical\_text.py - object for graphics

file\_search\_graphical\_non\_obj.py - old style

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Session 7: Graphics

go over previous session's homework:

1. iteration\_7.py - handle typos - illegal input

2. presentation/homework/solutions/file\_search.py

a. web search for python find string in string

b. IDLE doc string module -> str

go over simple graphics

Introduce debugging

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Programming / Python Tools

comments

arithmetic

numbers - int, float

strings

variables constants

flow control

decisions

looping

grouping

program files

iteration

functions (subroutines, procedures)

lists (arrays)

dictionaries (stuctures)

classes (stuctures)