General workshop agenda:

- Slides that cover topics and key takeaways from the workshop (~30 min)
- Small problems to work on with entire workshop (~15 min)
    - live coding demo and/or slides
- Bigger problem to work on in smaller groups (~60 min)
    - Groups of 2-3 students pair programming
        - Driver and observer(s)
    - worksheet with project instructions and git repo with starter code
- Regrouping at the end and share solutions (~15 min)

Workshop Materials

- Slides
- 2 example problems to go through as a large group
- 1 assignment for students to complete in pairs
- Each folder is a workshop in https://github.com/jasbury1/TutoringWorkshops:
    - Workshop_Name
        - Slides.pdf
        - Assignment
            - Starter_code.py
        - Solution
            - Solution.py

101 Workshops:

Workshop 1: Functions and Testing(Joey)

General takeaways

- Return statements
    - Why they are necessary
    - How to save the return value
- Writing good test cases
    - Why we write test cases
    - Looking for edge cases
- Calling arguments vs parameter names
    - The variable names don't have to match function argument names

- Scope
    - Relating variables in the ‘main’ with variables inside functions

Group project

- Write a couple of simple functions
    - Unit test the functions
- Incorporate functions into a main, and do something together with both results
    - Diff the output

Workshop 2: Strings and String formatting(Ryan)

General Takeaways

- Print formatting
    - Related to Moonlander project
    - Specify the number of decimals, whitespace padding, etc
- String editing
    - Concatenation
    - Slicing
    - Indexing into strings

Group Project

- Write 2 print statements that exactly match the format of a given string
- Converting strings to Pig Latin

Workshop 3: Nested loops and 1D vs 2D Coordinates(James)

General Takeaways

- How to convert between 1D and 2D coordinates
    - Row and column notation
    - Use of modulo
- How nested loops can break up a 1D array
    - Related to how word search wants a 100 character string broken up into an array of 10 character strings
- How nested loops can traverse a 2D array
    - Related to pixel magic traversing 2D pixels

Group Project

- Matrix Manipulations
- Printing out matrices separated by space instead of in list format

202 Workshops:

Workshop 4: Classes(James)

General Takeaways

- Class setup/syntax
- Class methods
    - __eq__
        - Why you can't compare instances using ==
    - __repr__ and __str__
        - Where each is used
    - Never actually call __xxx__ functions!
    - Creating other unique methods
    - Calling class methods
- What 'self' means
- Instances

Group Project

- Set up a Student class
- Create methods to filter and summarize list of students

Workshop 5: Recursion(Ryan)

General Takeaways

- Base case
    - Infinite recursion
- Returning values up the stack of recursive calls
    - Returning at the bottom does not automatically end recursion
    - Combining returned values of recursive calls for new value
- Recursive data structures
    - Why/ how to recursion with these data structures

Group Project

- Family tree node structure
- Create methods to traverse the tree to find great*i grandchildren

203 Workshops:

Workshop 6: Inheritance(Joey)

General Takeaways

- Eliminating redundant code
    - Identifying similarities between classes
    - super
    - instanceof
        - Grouping classes that similar actions are being performed on
- Abstract classes vs Interfaces

Group Project

- Zoo Project
- Get all monkeys from list of animals