# Introduction to Python

## Exercises

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# Outline

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# Exercises

## Play with the reference counter

- Assign four references an integer
- Add some stuff to one of the references and see what happened

## Standard Data Types

- add key/value to build a dictionary
- Use the dictionary instead of cases

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## Instantiate values

- Complex
- float
- Do a conversions
  - From float to complex
  - From complex to float

## Mathematical Functions

- Play with
  - Absolute value
  - Compare references
  - exponential function from math package
  - etc

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# Playing Random Functions in Lists

## import random

- Create a List
- Shuffle the elements
- Do a random choice

## Some other instructions to play with them

- randrange(a,b,step) - A unique number from a random number
- uniform - Uniform Distribution
- randint(a,b)
- sample()
  - random.sample(range(100),5)

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## Create two string

- Concatenate them

## Make them into a list

- Using the conversion list

## Extract stuff from a string

- Using the concept of a list

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## Generate a List

- Change some values in the list
- Concatenate Tree Lists
- Play with the Range Function
- Slice a List

## Generate a dictionary

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# Some Extra Stuff

## Using None and *

This is a special one

- [None]*10
- [1]*10
- etc

# Outline

# Exercises

## Do some operations using

1. a+b
2. a-b
3. b/a
4. a**b
5. a%b

# Outline

# Exercise

## Play a little bit with

1. <less
2. <>not equal
3. ! =Not Equal
4. > Greater

# Outline

# Exercises

## We have

- a = b+c
- c+=a
- c*=s
- c/=b
- c%=d
- c**=a

# Outline

# Exercises

## Play with the

1. And &
2. Or |
3. Xor $\hat{}$
4. Negation $\sim$
5. shift to the left $<<$
6. shift to the right $>>$

# Outline

# Exercises

## Belonging Operators

1. “in”
2. “not in”

# Outline

# Exercises

## Play with

- a is b
- a == b
- a is not b

# Outline

# Exercises

## Combine the if elif else

To select given a List of numbers from 0 to 100 which are a power of two

## For This

Remember the following pattern in bitwise

| | | | |
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| 2 | 0 | 1 | 0 |
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## Solve the following using a While Loop

1. Given a List of numbers from 0 to 100 with one not there
2. Set one of the numbers to zero using random
3. Find which one is not there using
    1. $\sum_{i=1}^{n} i = \frac{n(n+1)}{2}$

## Then

Print the one is not there!!!

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## Do the following

Given a list of random numbers

- Print the multiples of 3
- Print the multiples of 4
- Print the multiples of 7

## Hint

Use List+= [Number]

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$$S_n = \sum_k^n r^k$$

## Implement this in linear time $O(n)$

Hint accumulate a power!!!

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