

Midterm Study Guide

CST 205

The midterm will take place from 2PM to 3PM on Wednesday, April 11, 2018. The midterm will be on iLearn, but you must be in class to take it. You are allowed to have three pieces of standard 8.5 x 11 inch paper (front and back) for notes.

Here are the general topics that will be covered on the midterm:

- Python Essentials
 - Different ways of running Python (interpreter vs. Python files)
 - Whitespace in Python
 - Python's `input()` function
 - Using `range()` with step values
 - Concatenating strings
 - How to access characters in strings
 - Difference between `tuples` and `lists`
 - How to use Python `dictionary`
 - f-strings
 - `for` and `while` loops
 - Accessing elements in `lists`, `dictionaries`, and `tuples`
 - Python class definitions, how to create objects
- Image Manipulation
 - What is an image histogram?
 - How many channels in 8-bit grayscale image vs RGB image
 - How to get the **negative** of an RGB image
 - Basics of converting an image to **grayscale**
 - What is color distance?
 - What is **chroma key compositing**?
 - Idea behind shrinking and growing images
- Graphical User Interfaces (PyQt5)
 - What is the core of every PyQt5 application?
 - What is an event loop?
 - What is the signal-slot mechanism?

- Web applications (Flask)
 - Does a traditional web server understand Python?
 - Purpose of function decorator for Flask
 - Purpose of a template engine
 - Use of `url_for()`
- APIs and Web Scraping
 - What is JSON and how is it used?
 - What does it mean to parse HTML?
 - Why are regular expressions not effective when parsing HTML?
 - Which Python library did we use to parse HTML?
- Computer Vision
 - Relationship between OpenCV and NumPy
 - OpenCV's `highgui` module
 - What is a classifier?
 - What to do with image before detecting faces?
 - What does “roi” stand for with respect to OpenCV
- Digital Sound
 - Digital vs analog sound
 - Unit of measure for the rate of vibrations per second
 - Difference between high pitch and low pitch sounds
 - Sampling rate for audio CDs
 - Audio bit depth
 - Which libraries we used to create our `.wav` file