

# Homework 1

## Computer Vision, Spring 2024

### Due Date: February 2, 2024

### Total Points: 7

Note 1: Seven (7) computational homework assignments will be given throughout the course, designed to put into practice the material covered in class and assess your understanding. Some homeworks are lighter than others; their relative weights in your final homework grade are determined by the total number of points listed at the top. You will have a total of 2 weeks to complete each assignment. All due dates on Friday 11:59PM

Note 2: There will be two types of problems in homeworks: **programming walkthroughs** and **programming challenges**. A homework may or may not contain both types of problems. Below is a brief description of each problem type.

**Programming Walkthrough:** These are “lightweight” programming assignments, which essentially walk you through partially complete code and ask you to fill in the missing segments. These assignments are designed with the following two goals: 1) to help you get started with Python (if you are not yet familiar with it), 2) to demonstrate some of the important concepts discussed in class in Python.

**Programming Challenge:** These are programming challenges to solve a variety of computer vision tasks using Python. In most cases a testing framework or skeleton code will be provided. Your submitted code must work with these.

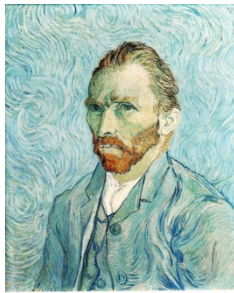
Special instructions regarding allowed or disallowed functions will be explicitly stated in the description of each programming problem. You are required to submit the completed code and the generated outputs for both programming walkthroughs and challenges.

Follow the separate document titled “**Guidelines for Programming Assignments**” for programming guidelines and submission information.

The goal of this programming assignment is to get you started with PYTHON for image processing and computer vision. The accompanying PYTHON script **runHw1.py** contains instructions and partially complete code to illustrate some of the basic concepts of PYTHON. Your tasks are to fill in the incomplete code, and to generate the results by executing the script. Include both the completed script and the outputs in your submission.

**Walkthrough 1:** Go through the `hw1_walkthrough1.py` for a brief introduction of PYTHON. Have fun experimenting with different commands. Additional tutorials can be found here [1]. You are not required to submit any code for this Walkthrough 1. **(0 points)**

**Walkthrough 2:** Fill in the missing parts in `hw1_walkthrough2.py` to read an image and generate a 2x2 collage as shown below. The four patches of the collage are the original image and its red, green and blue channels. Submit both the completed script and the output. **(3 points)**

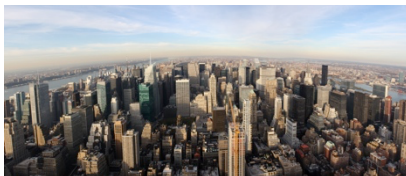


Input [2]



Output

**Walkthrough 3:** Complete `hw1_walkthrough3.py` to superimpose the “I Love NY” logo on top of a Manhattan scene. **(4 points)**



Inputs [3][4]



Output

## References and Image Credits

- [1] PYTHON Documentation Center. [Online]. <https://www.python.org/doc/>
- [2] [Online]. [http://en.wikipedia.org/wiki/File:SelbstPortrait\\_VG2.jpg](http://en.wikipedia.org/wiki/File:SelbstPortrait_VG2.jpg)
- [3] I Love New York logo. [Online].  
[http://en.wikipedia.org/wiki/File:I Love New York.svg](http://en.wikipedia.org/wiki/File:I_Love_New_York.svg)
- [4] Ruben Moreno Montoliu. [Online].  
<http://www.flickr.com/photos/ruben3d/4392232665/>