**IS201 Fundamentals of Computing**

**HOS10 Manipulating Images and GUI Automation**

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 A white cat in a circle with a blue and black logo

Description automatically generated

**Before You Start**

* The directory path shown in screenshots may be different from yours.
* Some steps are not explained in the tutorial**.** If you are not sure what to do:
  1. Consult the resources listed below.
  2. If you cannot solve the problem after a few tries, ask a TA for help.

**Learning Outcomes**

Students will be able to:

* Manipulate images with Python’s Pillow module

**Resources**

* [Automate the Boring Stuff with Python](https://cityu.alma.exlibrisgroup.com/discovery/openurl?institution=01CITYUNIV_INST&rfr_id=info:sid%2Fsummon&rft_dat=ie%3D5165539880004251,language%3DEN&svc_dat=CTO&u.ignore_date_coverage=true&vid=01CITYUNIV_INST:Services)

**Manipulating Images**

Python’s **Pillow** module allows you to interact with image files such as cropping, resizing, and editing the content of the image.

*Before using the module, this is the basic understanding of computer image. An RGBA value represents color in image (red, green, blue, alpha(transparency)). Each value is between 0-255, for example (255, 255, 255, 255) means maximum of white and fully opaque. In pillow, it makes things easier for you, no need to memorize RGBA value. So, (255, 255, 255, 255) equals to ImageColor.getcolor(‘white’, ‘RGBA’)*

**Create a Project**

Follow HOS1 to set up the project in Codespaces, or use any other code editor you prefer, such as Visual Studio, Visual Studio Code, Sublime, Vim, etc…

We will create a Python project to cover all the learning outcomes.

1. Create a Python file named HOS10.py.
2. Install the required module through the terminal.

A screenshot of a computer

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1. Download a JPEG image from Google or use any image you prefer. Save the image in the same directory as the source code.

A building with a sign on the side

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1. Right-click the image file to retrieve the path and save this path in the notes.

A screenshot of a computer

Description automatically generated

1. Type the following source code under the hos10.py file, update the actual path in rotate\_image() function.

A computer code with text

Description automatically generated

1. The expected output:



1. A new rotated image will be created under the same path.

A building with a large sign on it

Description automatically generated with medium confidence

**Submission Instructions**

Once you have all submission files in your original downloaded GitHub folder, go to your command line interface in Terminal and type the following commands one by one:

* git add .
* git commit -m “Submission for Module 01 – Your First and Last Name”
* git push

You may need to add “origin” or “origin master” to the last command if you have an error.

If you have GitHub Desktop, you should see your staged commits (“git add .”) in the left-hand side bar. Type in “Submission for Module 01 – Your First and Last Name]” in the commit message box and press the commit button, then the blue “push origin” button.

Go to your Classroom GitHub web page for this assignment – the same one you downloaded from – and make sure the page is refreshed. This should confirm that you submitted the correct files along with a time stamp.