

Assignment 2: Using For Loops for File Processing

30 Points scaled to 20 Points

Introduction

This assignment focuses on using for loops to iterate over files and/or directories to automate repetitive tasks. You have been provided with a folder containing CSV files representing satellite data collected at different plot locations within the extent of a forest fire (“plots”). You will merge all the provided CSV files into a single CSV file containing all of the records. Next, you have been provided with a folder containing pictures taken in Acadia National Park (“pics”). You will iterate over these pictures to reduce their size, convert them to grayscale, and save the results back to disk. Lastly, you will use loops to create directories and subdirectories in which to store results.

Objectives

- *Use for loops*
- *Read and write files to disk from code*
- *Create folders and directories from code*
- *Perform basic file reading, processing, and writing*

Deliverables

- *Jupyter Notebook (Python) or R Markdown file (R) with all code embedded. Files can be rendered to HTML webpages if your instructor requires this. Include the task text using Markdown.*

Tasks

This assignment can be conducted using either Python or R, whichever you prefer or whichever you instructor requires. Generate code to perform the following tasks.

Task 1. Write code that will read all of the CSV files from the “plots” folder and combine them into a single file. Once you have obtained the single file, write it back to disk. All the CSV files have the same columns. Each row represents a satellite image observation on a certain date while each file represents all data for a specific plot. Your final file should contain all observations for each site in the same file. (10 Points)

Task 2. Loop through the images in the “pics” folder and perform the following operations on each image: (1) resize the image to 1232-by-812 pixels, (2) convert the image from RGB to grayscale, and (3) save the result back to disk in a new directory. In

R, I would recommend using the imager package. In Python , you can use PIL. (10 Points)

Task 3. Use for loops to create 10 empty sub-directories inside of a main folder. Within each subdirectory, create 100 folders. You can choose the naming convention of the folders. (10 Points)