

A6: Picture Editing Function and Loop

You have been provided with a folder of pictures from the southwestern United States. This assignment asks you to write a function to perform some editing tasks on these images. **Hint: the `imager` package can be used to process images in R.** Deliver the resulting function and code within an HTML webpage generated from an R Markdown or Quarto file. Use headers or text to differentiate each component of the assignment.

Create a function with the following characteristics.

1. Function accepts the following parameters: an input image, a Boolean variable indicating whether or not to crop the image, lower bounds representing the percent of the image to crop, upper bounds representing the percent of the image to crop, a Boolean variable indicating whether or not to resize the image, a resizing factor, and a Boolean variable indicating whether or not to convert the image to grayscale. **(8 Points)**
2. Function is able to crop an image by a random percentage in both the X and Y directions within the specified upper and lower bounds. For example, if the lower bound is set to 20% and the upper bound is set to 40%, a random percentage in this range will be selected then used to crop the image. Different random values between the lower and upper bounds should be able to be applied for the X- and Y-direction crops. **(8 Points)**
3. Function is able to resize the image by the specified factor. For example, if the factor is 1, this means that the image is not resized. If the factor is 0.5, the resolution is decreased by half. The image should maintain its original aspect ratio. **(6 Points)**
4. Function should be able to convert the image to grayscale if the user specifies this. **(6 Points)**
5. Function should return the image object as a variable. **(4 Points)**

Use the function within a for loop to process all of the images in the folder. Each iteration of the loop should process one image. Save the results to a new folder on disk. Plot or show one pair of images on your resulting page consisting of the original image and the processed image. **(8 Points)**