Exercise 6- Seam Carving

When you look at an image, there are parts that we care about, and some that we may not. For example take a look at this picture of my dogs, Coco and Duke:

In this image, do we have much empty space? What do we define as being empty space? To help visualize this a little more, take a look at this image of a caterpillar I took:

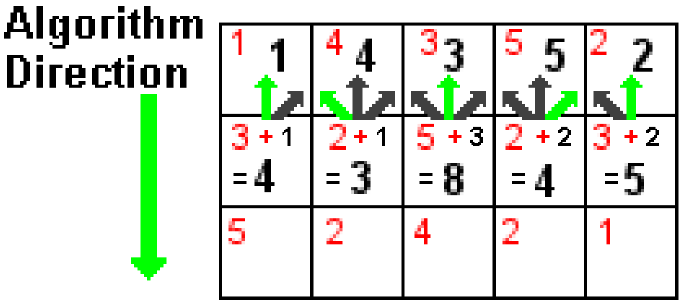
Do we see any empty space here? I would say so, for example I think an image like this would help me focus in on the objective of the photo, the caterpillar.

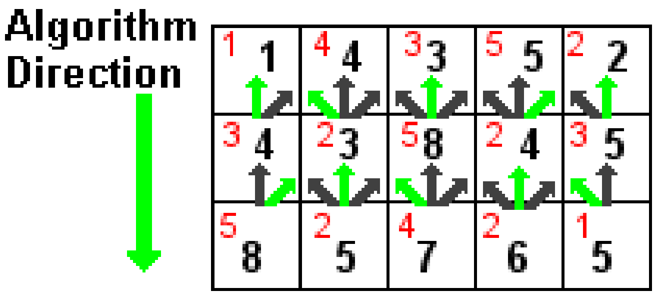
Our goal in this exercise is to carve out unnecessary seams from an image that are irrelevant for the objective of the image itself. But, how do we decide what is unnecessary?

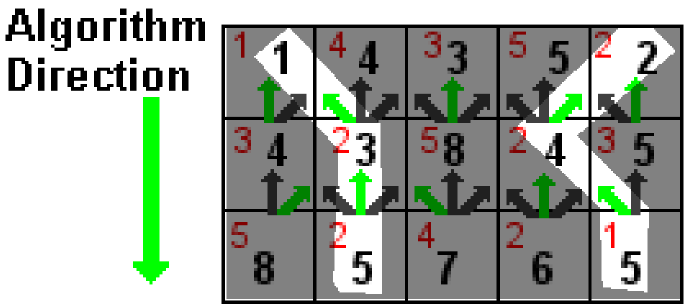
The Algorithm

We will be viewing each vertical column of pixels as a seam in an image. Using Dijkstra's algorithm, I would like you to decide which columns to take out. There are a couple of ways you can do this (using the gradient of the image, having an adjacency matrix etc. etc.). Now, pixels have red, green and blue values, so you will have to find a way to represent all three as one value (the average is a good place to start). It does not have to be a perfect algorithm, mostly because I am forcing you to use Dijkstra instead of some other algorithms.

Here is a visualization of how the algorithm could work:







Final Notes:

In the console, this should be the order of actions:

- Ask me which image I would like to carve seams from.
  - Print the image
- Ask me how many seams I would like to carve.
  - Print the resulting image after removing those seams
  - Ask me if I would like to save the carved image

Please make sure you use the APImage project I have put on myMCPS. I also highly recommend that you start with small images first, then make your way to larger images. If you would like more information on seam carving take a look at the Wikipedia page here: https://en.wikipedia.org/wiki/Seam_carving

If you would like to see a sample implementation or help with Djikstra's algorithm take a look here: https://www.geeksforgeeks.org/dijkstras-shortest-path-algorithm-greedy-algo-7/