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Color Quantization & Dithering

For the final project I propose writing and implementing a program to implement color quantization and dithering on inputted images following the technique implemented in this [video](#) I found interesting. The idea behind this is a popular post-processing effect in video games, most commonly found in the video game Dead Cells, where 3D renders are rendered out as 2D pixel art with normal maps in order to allow for dynamic lighting effects and more efficient animating. In this way, I plan to create a version of this post processing effect for real life images in order to turn real life images into a 2D pixel art render of the image without losing the semantic information within the image using dithering, sharpening, and color palette quantization. The final program should be able to allow users to input a real life image with a desired color palette and produce a corresponding pixelated image of the desired color palette without compromising the clarity within the image.