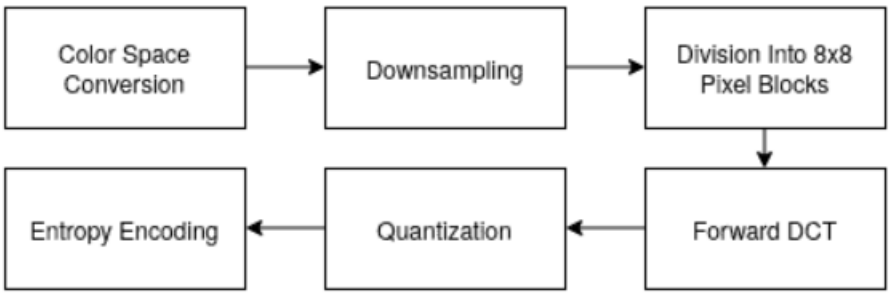
JPEG Compression Explanation

JPEG => JPEG stands for Joint Photographic Experts Group.

Lossy Compression Algorithm that results in significantly smaller file sizes with little to no perceptible impact on picture quality and resolution.

JPEG Compression Steps:



The above steps result in a .jpg image file.

Step1. Color Space Conversion: like RGB, Gray scale, CMYK and more. JPEG changes color space to YCbCr.

Step 2. Downsampling: JPEG downsamples the chrominance channels to a quarter of their original size. Each block of 4 pixels is averaged into a single color value for all 4 pixels. As a result, some information is lost, and the size of the picture is halved.

Step 3. Division into 8X8 Pixel blocks: After downsampling, the pixel data of each channel is divided into 8×8 blocks of 64 pixels. From now on, the algorithm processes each block of pixels independently.

Step 4. DCT(Discrete Cosine Transform): Using DCT, for each channel, each block of 64 pixels can be reconstructed by multiplying a constant set of base images by their corresponding weight values and then summing them up together.

Step 5. Quantization: Using DCT, for each channel, each block of 64 pixels can be reconstructed by multiplying a constant set of base images by their corresponding weight values and then summing them up together.

Step 6. Entropy Encoding: Run Length Encoding and Huffman Coding Algorithm.