# BMP image files

* a file is just a sequence of bits, arranged in some fashion
* A 24-bit BMP file, then, is just a sequence of bits, (almost) every 24 of which represent some pixel’s color
  + Where every 8 represent the concentration of each of the RGB colors
  + In BMP file, however, the arrangement is reversed to BGR.
  + Since each is represented by 8 bits, or 1 byte, we can represent the number in 2 hexadecimal digits
  + 00 00 ff signifies red
  + 00 00 00 signifies black
  + Ff ff ff signifies white
* But a BMP file also contains some "metadata," information like an image’s height and width. That metadata is stored at the beginning of the file in the form of two data structures generally referred to as "headers".
  + The first of these headers, called BITMAPFILEHEADER, is 14 bytes long. The second of these headers, called BITMAPINFOHEADER, is 40 bytes long.
    - The **BITMAPFILEHEADER** structure contains information about the type, size, and layout of a file that contains a DIB (device-independent bitmap).
    - The **BITMAPINFOHEADER** structure contains information about the dimensions and color format of a DIB.
  + A 24-bit BMP’s first 14 + 40 = 54 bytes are filled with metadata. Immediately following these headers is the actual bitmap: an array of bytes, triples of which represent a pixel’s color.
* Some BMPs also store the entire bitmap backwards, with an image’s top row at the end of the BMP file.
* Each row (aka "scanline"), number\_of\_pixels \* 3 (3 bytes per pixel), should be a multiple of 4.
  + Otherwise the scanline is "padded" with as many zeroes as it takes to extend the scanline’s length to a multiple of 4.