Bitmap Image Representation

# What is a bitmap?

A bitmap, file extension .bmp, is a raw image file type. It’s different from most other methods of storing image files as it stores each individual pixel, in the highest resolution. This happens to be one of the most widely used image types due to its advantages with image editing, as you can edit each individual pixel. However, as useful as it is, Bitmaps have their disadvantages. One of these disadvantages are that resizing the bitmap image causes a large drop in quality. Another is the large file size as usually, bitmaps are rarely compressed.

When a bitmap displays a coloured image, the several shades of colour in each pixel will have either 16, 24 or 48 bits assigned with it. Bitmaps are built purely by pixels, so they are preferable for projects such as favicons, icons & logos.

There are numerous methods to compressing a bitmap, including the popular .gif format. However, a gif file only has a palette of 256 colours. On the other hand, a gif file can easily be resized and manipulated. Much easier so that the bitmap. On the internet, bitmaps are mainly converted to JPEGs. This can display more than 256 colours and is better than the gif when it comes to rendering photographs. However, JPEGs cannot easily be resized without losing some image quality.

# Bitmap File Size

There are multiple structures in a bitmap file that contribute to file size:

Bitmap File Header – **14 bytes** – This stores general information about the file

DIB Header – **Fixed Size (various versions)** – Stores detailed information about the bitmap and defines the pixel format

Extra bit masks – **16 bytes** – To define the pixel format.

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Colour Table – **Variable** – Defines the colours used

Colour Table – **Variable** – To define the actual values of the pixels.

In order to calculate the depth of a bitmap, which is required to calculate the filesize, you need to get the amount of colour bits you are using. Generally, bitmaps use a 32-bit or 16-bit colourmap. You can calculate the filesize in kB by using the formula:   
size = (W\*H\*D)/(8\*1024)  
Where W is Width, H is Height & D is Depth.

An example of calculating file size is:

|  |  |  |
| --- | --- | --- |
| *Image Dimensions* | *Colour Depth* | *File Size* |
| *128 x 128* | 1 bit | 2kb |
|  | 8 bits | 16kb |
|  | 24 bits | 48kb |
| *256 x 256* | 1 bit | 8kb |
|  | 8 bits | 64kb |
|  | 24 bits | 192kb |
| *1K x 1K* | 1 bit | 128kb |
|  | 8 bits | 1mb |
|  | 24 bits | 3mb |