Pre-workshop questions

a) **Describe in a couple of sentences how (colour) image data is stored in a bmp file. Is the image compressed or uncompressed? How many bits are used to represent each pixel?**

A bitmap graphic stores all the pixels of a image with out any compression with usually four parts:bmp file header,bitmap information,color palette(optional) and bitmap data

So the image in bmp files are uncompressed with usually large size.The bitmap allows 1, 2, 4, 8, 16, 24 and 32 bits to represent a pixel.

b) **Describe briefly in your own words how the JPEG image coder/decoder works. Is JPEG compression lossy or lossless? Explain the difference.**

In encoder,First divide the image into 8*8 blocks and perform a DCT on each block.Then,Quantize the block and get DC & AC coefficients,after that,encode the coefficient with huffman coding algorithm to transmit.

In decoder,first decode the huffman coding into the DC & AC coefficients.Then,transform the coefficients with the quantize table.After that ,perform the IDCT to get each block.Finally,merge all 8*8 blocks into a whole image.

the JPGE is lossy because it drops much AC components and remain DC components.(more focus on luminance)

The lossy compression lose some information with each compression and the image cannot fully recover and the lossless compression contains all the information and can be fully recovered.

c) **What would you expect a heavily compressed JPEG image to look like? Explain why.**

For a heavily compressed JPEG image ,it contains most luminance parts and drops most of the chrominance.Hence,the edges of objects in image will looks vague.

d) **JPEG exploits redundancy within a picture. What sort of redundancy occurs between pictures in a video? How do you think that redundancy could be exploited to reduce the number of bits to be transmitted?**

The redundancy of pictures in a video in that the continues picture in a video are most same with a little difference.So we can just transmit the difference rather than the whole picture information.