CSCU9N5: Multimedia and HCI

Graphics Tutorial - Answers

Question 1

Ans. A possible example: a photo of a person placed on a solid colour background. For this image the following sizes were found (using Adobe Photoshop, rather than GIMP, but results will be similar): Photoshop native PSD 1.09Mb; BMP 585kb; GIF 82.9kb; PNG 201kb; JPG 25.3kb. Defects seen were quantization of facial colours with GIF and artifacts on the boundary between the photo and the background with JPG.

Question 2

1. Ans. Applying the algorithm given in lectures results in the following:

1	2	3	4	5	6	7	8	9	10
A	A	A	A	b	b	b	A	A	A

Index	c	w	w + c	Output	Dictionary
1	A	""	A	-	found
2	A	A	AA	A	#256 = AA
3	A	A	AA	-	found
4	A	AA	AAA	#256	#257 = AAA
5	b	A	Ab	A	#258 = Ab
6	b	b	bb	b	#259 = bb
7	b	b	bb	-	found
8	A	bb	bbA	#259	#260 = bbA
9	A	A	AA	-	found
10	A	AA	AAA	-	found

Final output: A, #256, A, b, #259, #257

2. Ans. Reconstructed sequence is AzAzzzAzA

This can be reconstructed because every dictionary entry is either a single character or a 2-character or longer sequence of characters that have already appeared in the data. Thus the dictionary entries for this data must be:

#256 = Az, #257 = zA, #258 = Azz, #259 = zz, #260 = zAz

Note that not all of the dictionary entries will necessarily be used in the compressed sequence.

Question 3

Ans.

	Image A	Image B	Image C
a)	Any format with lossless compression eg BMP, GIF, PNG, TIFF. Limited colour palette of GIF will not matter here.	Uncompressed image format, such as BMP or TIFF or any lossless format with large colour palette eg PNG. Lossy compression with JPEG may still be fine.	Uncompressed (eg BMP, TIFF) or lossless (eg PNG). JPEG may be ok at a low compression level, but could introduce artifacts around the text.
b)	Files using RLE or LZW compression should work well eg GIF, PNG for LZW.	JPEG is best for real world images like this as will retain reasonable quality for a small file size.	JPEG is likely to produce the smallest file that still has ok visual quality (but may distort the text).
c)	GIF and PNG are web-compatible and will provide small file sizes.	JPEG is also web compatible, so best for use on a web page.	JPEG likely, or could use PNG (but may have a large file size).
d)	Any of the above are fine as they are all lossless.	Must use raw data or lossless compression eg BMP or PNG. Limited colour palette of GIF may introduce losses.	BMP or PNG, so that there are no losses.