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NZQA

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COMMON ASSESSMENT TASK

Level 1 Digital Technologies 2021

91887 Demonstrate understanding of compression coding for a chosen media type

Credits: Three

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of compression coding for a chosen media type.	Demonstrate in-depth understanding of compression coding for a chosen media type.	Demonstrate comprehensive understanding of compression coding for a chosen media type.

Type your School Code and 9-digit National Student Number (NSN) into the space below. (If your NSN has 10 digits, omit the leading zero.) It should look like "123-123456789-91886".

Make sure that you have the scenario page.

Answer ALL parts of the assessment task in this document.

You should aim to write **800–1500 words** in total.

Your answers should be presented in 12pt Times New Roman font, within the expanding text boxes, and may include only information you produce during this assessment session. Internet access is not permitted.

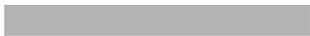**Save your finished work as a PDF file** as instructed by your teacher.

By saving your work at the end of the examination, you are declaring that this work is your own. NZQA may sample your work to ensure this is the case.

Achievement

TOTAL | **03**

ASSESSOR'S USE ONLY

INSTRUCTIONS

The task in this assessment requires you to discuss compression methods for ONE media type (image, video, or audio) with reference to the scenario provided.

Read the scenario and all parts of the task before you begin.

All your answers must be based on the same media type.

Scenario (specify "A" or "B"):

A

Chosen media type (specify "image", "video", or "audio"):
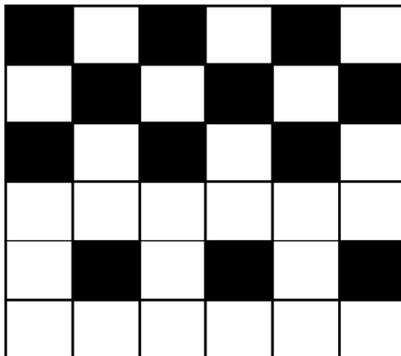
image

ASSESSMENT TASK

(a)   Explain the reasons why files of your chosen media type might be compressed.

> The chosen media type is image. An image might be compressed in order to reduce the size of the document. When there is photographs for magazine, newsletter, school website and copies need to store in the school network, if every pieces of files were present as its original size, there won't be enough space to store them all. By compressing the image, more space in the school drive is saved and can fit in more files. A compression is divide into lossy compression and lose less compression. Lossy compression is reduce the bits in the image/files that hopefully people will not notice. As the bits in image decrease, the number of color pixel decrease as well. Along this compression, data is lost and the quality reduce. Sometimes lossy compression affect the image badly and it became hard for people to recognize. Lossless compression is putting the file in zip to reduce the storage. People need to unzip the file when they need the original bits and data in the file. However, to unzip the file take a bit of time but less data will lose than lossy compression.

(b)   (i)   Explain how files of your chosen media type can be represented using bits in an **uncompressed** form.

> Uncompressed form means the file/image has the original number of data when it was created. An image can be represented through bits of pixels. A pixel is a small block of color and bit and hold pixels. The number of color is representing by bits in binary. If the number of bits is n, it can hold 2^n different color. An image is presented in neither black and white or color. When the image is black and white, it means pixels in image is neither black or white. the number of bit is 1. The color white is coded in 0 and black is coded in 1. Therefore, there are less data stored in 1-bit image. The image and codes are presented as below.
>
> | 1 | 0 | 1 | 0 | 1 | 0 |
> |---|---|---|---|---|---|
> | 0 | 1 | 0 | 1 | 0 | 1 |
> | 1 | 0 | 1 | 0 | 1 | 0 |
> | 0 | 0 | 0 | 0 | 0 | 0 |
> | 0 | 1 | 0 | 1 | 0 | 1 |
> | 0 | 0 | 0 | 0 | 0 | 0 |
>
> When the image is in color form, it means the image includes more color than just black and

white. The common present is RGB color. It's an image in a mix color of red, green and blue. The image is presented in 3 bits in 8 color (2^3=8): black, blue, green, red, cyan, light pink, yellow and white. If an image is presented in color, color depth affects a color in each pixels. The color depth is how many color in each bit it stores. The highest is 255. In the table below, 1 codes for 255 and 0 codes for 0.

black	0	0	0
blue	0	0	1
green	0	1	0
red	1	0	0
cyan	0	1	1
Light pink	1	0	1
yellow	1	1	0
white	1	1	1

3 bits' image
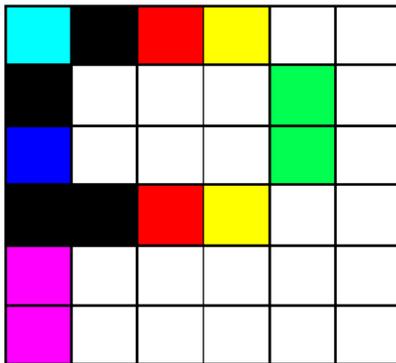
011	000	100	110	111	111
000	111	111	111	010	111
001	111	111	111	010	111
000	000	100	110	111	111
101	111	111	111	111	111
101	111	111	111	111	111

As the tables shows, more bits, the more color present. When the files are in an uncompressed form, the image can be presented like this.

(ii)   Explain how a method of **lossless compression** works for files of your chosen media type.

A lossless compression means the files has been compressed but recovered as its original size. When an image is transfer, it might be compressed in a reason of quicker upload. Therefore, less bits of color transferred. But when it is download again, the bits will recover in order to make it lossless. For example, I need to take photos of the school website and Facebook page which contains words in the image. A lossless compression will be used to make sure no bits of color it loses so people can recognize what the words are if they are small in the photograph.

(c)　(i)　Referring to the scenario, select ONE of the required outputs for your chosen media type where a **lossy compression method** would be appropriate, and:
- explain why this method would be more suitable for the output than another compression method
- explain how this method would affect the output from the end user's perspective.

A lossy compression method would be appropriate for photographs for the school's print magazine. If the magazine is printed, there will be less requires for a picture to present clearness of the word is in photographs. The point of taking this photo might be we have a school magazine (which introduce or school well) but not what people wrote in magazines. When I upload photographs of the school print magazine, lossy compression is appropriate to leave more space on school drive. The end user will be affect because the loss of data. The image might appear not as clear as it was taken. It might be hard for the person to recognize words in magazine.

(ii)　Referring to the scenario, select ONE of the required outputs for your chosen media type where a **lossless compression method** would be appropriate, and explain why it would be more suitable than another method.

A lossless compression method would be appropriate when copies for the school's archive is uploaded. Copies take more space because there are two copies of files, the total data is 2 times bigger. I would use lossless compression method to safe the second copy of files in school drive and if there is data lose, my copy will be the same quality as the original files. Lossless compression will safe space for school drive and download again while needed.

(iii)　Referring to the scenario, select ONE of the required outputs for your chosen media type where an **uncompressed storage method** would be appropriate, and explain why it would be more suitable than another method.

An uncompressed storage method would be appropriate if the photographs required the clearness and quality of the image presented such as images with words (a gallery page with thumbnail links to full-size images). I need to make sure there is no data lost because there are words in image. When bits are lost in transfer, the pixel of word will become darker around the edge which becomes hard to recognize. Uncompressed storage method would be appropriate to make sure the words are transfer clearly as it was taken from losing data.

Achievement Exemplar 2021

Subject	Level 1 Digital Technologies		Standard	91887	Total score	03
Q	**Grade score**	**Annotation**				
1	A3	The candidate has demonstrated a clear understanding of the difference between lossy and lossless compression. They have given a reason for compression (storage) but ignored other factors such as file transfer or upload / downloads. They have explained well how bits are used to represent a file, and clearly demonstrated that they understand how colour channels are combined to make a colour. However, they have stopped at 8-bit colour depth without mentioning the more common 24-bit depth. Their understanding of how a lossless compression method works is superficial without a clear explanation. The candidate's understanding of practical applications of compression appears limited, as they have selected inappropriate outputs for lossy compression and uncompressed storage methods.				