**AP CSP**

**Unit 2 – Part 1 – Review**

Name: Key

1. Vocabulary:

- Byte - a chunk of 8-bits → used to represent information
- Heuristic - a problem-solving apprach (algorithm) to find a satisfactory solution where finding an optimal or exact solution is impractical or impossible
- Lossless Compression - a data compression algorithm that allows the original data to be perfectly reconstructed from the compressed data.
- Lossy Compression - (irreversible compression) a data compression method that uses inexact approximations, discarding some data to represent the content. Most commonly seen in image formats like .jpg
- Image - a type of data used for graphics or pictures
- Metadata - is data that describes other data. For example a digital image may include metadata that describe the size of the image, number of colors, or resolution.
- Pixel - short for "picture element" it is the fundamental unit of a digital image, typically a tiny square or dot which contains a single point of color of a larger image.
- RGB - the RGB color model uses varying intensities of Red, Green, and Blue light are added together in to reproduce a broad array of colors.

2. What are bytes, megabytes, kilobytes, and gigabytes? What are examples of files types that are measured in this unit?

bytes → 8 bits → .txt
~~megabytes →~~
kilobytes → 1,000 bytes → .jpeg
megbytes → 1,000 KBs → .mov
gigabyte → 1,000 MB → harddrive

3. How are black and white vs. color images encoded differently?

b + w → 1, 0, 1, 0

color → RGB represented by 24 bits for each pixel

4. Why is compression a difficult task?

no perfect solution → algorithm able to be found, there is a tipping point between compression size + dictionary ~~"metadata"~~ size

5. Why is it helpful to use hexadecimal numbers to represent colors?

easier to represent with ~~63~~ Hexadecimal numbers vs. 24 bits

6. What is the key difference between lossy and lossless compression?

lossy → data lost ("unimportant" data)

lossless → no data lost → it is possible to recover images

7. What is the difference between the file formats JPG and PNG?

lossy lossless