CMPT363 – Project 2

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Question 1:

- I managed to implement Huffman and LZW encoding that can achieve roughly from 1.2 to 1.6 compression ratio for the sample inputs. I also encoded both header data and sample data. For each header data, I treated one byte as one symbol and for samples data I treated 1 sample (2 bytes) as 1 symbol
- The compression ratio is computed as:

$$\text{Ratio} = \frac{Number\ of\ bits\ to\ represent\ original\ file}{Number\ of\ bits\ of\ encoded file}$$

File name	Huffman compression ratio	Lzw compression ratio	FLAC
car+horn+x.wav	1.2616	1.2138	1.8148
Explosion+1.wav	1.2016	1.2205	1.5542
Fireignite.wav	1.2060	1.2335	1.6260
Leopard.wav	1.6548	1.5587	2.00

- Compared with FLAC coding, this compression ratios that I achieved are quite lower than FLAC's compressions. The reason is that what I did was just to apply normal Huffman and LZW encoding technique while FLAC coding includes many sophisticated techniques to compress an audio file. For example, FLAC always tries to predict a mathematical description of the audio signal so that it can obtain a better compression pattern. When a WAV file is compressed by FLAC, it only encodes the 'fmt' and 'data' sub-chunks of WAV file so FLAC can avoid encoding unnecessary data from WAV, therefore it can achieve a better compression ratio.