

Lab 13

(a) One method of reducing bandwidth use is to compress the data being transmitted. Let $A = \{a/20, b/15, c/5, d/15, e/45\}$ be the alphabet and its frequency distribution. Compute the optimal coding for each character. What is the average number of bits/symbols of the codes?

A = 10

B = 1111

C = 1110

D = 110

E = 0

$$\begin{aligned}\text{Average bit count} &= A(2) + B(4) + C(4) + D(3) + E(1) / 5 \\ &= 2.8\end{aligned}$$

(b) Briefly explain how delta compression works and give an application as example where delta compression is used.

Delta Compression is where only the differences to known base files are stored discarding any similarities. To achieve decompression, you would apply the store changes to the base file only leaving the new file.

An example of where delta compression is used, where there is a high degree of redundancy between target and references files, which would lead to a much smaller compressed size file.

(c) One method of reducing bandwidth use is to compress the data being transmitted. Use the LZW algorithm to compress the string: BABAABAAA. Note that Uppercase A has ASCII value 65 in decimal. Draw diagrams to aid your explanation if appropriate.

Table = [

A = 0,

B = 1,

C = 2,

D = 4,

BA = 5,

AB = 6,

BAA = 7,

ABA = 8,

AA = 9

]

B = 1 [BA not in the table.]

A = 0 [BA not in the table.]

BA = 5 [BA not in the table.]

AB = 6 [BA not in the table.]

A = 0 [BA not in the table.]