1. Linux compression commands:

Here is the compression commands demoed in the class. Please find a linux terminal to practice the commands using different files.

Following links are recommended: <https://explainshell.com/> and https://tldr.sh/

7za a tensorflow-master

tar -zcf tensor.tar.gz tensorflow-master

tar -jcf tensor.tar.bz2 tensorflow-master

tar -Zcf tensor.tar.Z tensorflow-master

7za x tensorflow-master.7z

tar -Zxf tensor.tar.Z

tar -jxf tensor.tar.bz2

tar -zxf tensor.tar.gz

1. 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/symbol of the codes?

Answer:

* We sort the order from highest frequency to lowest so the new order will be c, b, d, a, e.
* We added the 2 least frequency to form a node. In this case, c will be added to b (or d because b and d have the same frequency) to form 20.
* Take the newly formed node and added the next lowest frequency which is d with 15 to form a new node of 35.
* Take the new node of 35 and plus a which form 55.
* The last node should be new node plus e which form 100

Calculation:

A = 100 -> 20 \* 3 = 0.6

B = 101 -> 15 \* 3 = 0.45

C = 111 -> 5 \* 3 = 0.15

D = 110 -> 15 \* 3 = 0.45

E = 0 -> 0.45 \* 1 = 0.45

Total = 2.1

So, the final answer is 2.1 bits per symbol is the asnwer

In tree node, it will look like:

P4

0 1

E P3

0 1

A P2

0 1

B P1

0 1

C D

1. Please describe the information exchanges and the actions taken for both server and client according to the diagram for delta compression.

Chart

Description automatically generated with medium confidence

First, the Server send the client a base state.

Server send the client state 1 and the client acknowledge it but by the time it acknowledged, the server has already sent state 2 so the server sends it as this is the change state of 2 from base state as client did not send acknowledgement state 1 in time. Client acknowledge state 3 however it fails and the server try to send state 4 from state 2 but it failed as well. The server then send state 5 from state 2 for client as that was the last state that was acknowledged by client and received by server.

1. 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.

Dictionary

|  |  |
| --- | --- |
| A | 65 |
| B | 66 |
| BA | 256 |
| AB | 257 |
| BAA | 258 |
| ABA | 259 |
| AA | 260 |

BABAABAAA

B = 66

A = 65

B = 256

A = 257

A = 65

A = 260