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**Part 1: Compression (40 points)**

🡺 your dictionary of compression token to string characters, one entry per line.

@the

#spider

$and

%itsy

\*spout

1rain

2came

🡺 the compressed rhyme with the token substitutions,

@ % b% # crawled up@ water \*

down 2@ 1 $ washed@ # out

out 2@ sun $ dried up all@ 1

$@ % b% # went up@ \* again

🡺 What is total dictionary plus compressed text characters as a percentage of the original text’s 187?

36 dictionary characters with spaces

+ 111 compressed rhyme characters with spaces

= 147 total

/ 1.87 total compressed divided by original text size

= 78.61% of original text

🡺 **Now test your compression dictionary.** Reverse the process to see if your compression dictionary is accurate. Process dictionary items from the bottom up: find the compression character in the compressed data and replace it with the original string. **Paste the decompressed version below** – *even if it is not perfect*. **What modifications, if any, does the compression dictionary need to return the compressed data back into its original state?**

the itsy bitsy spider crawled upthe water spout

down camethe rain and washedthe spider out

out camethe sun and dried up allthe rain

andthe itsy bitsy spider went upthe spout again

There are certain places where 2 strings got connected to each other, and to return this to its original state, I need to separate those strings. Such as upthe in first line, camethe and washedthe in second line and so on.

**Part 2:**

**🡺** Paste the image of the Windows [File] Explorer .zip archive information.

A screenshot of a computer

Description automatically generated with medium confidence

🡺 Files with the **lowest** ratios were compressed the **least**. Ratio indicates % of space saved.  
Which file types compressed the least? Why would that be? (**10 points**)

* Macaw (GIF), CP4P\_Week9\_Activity (Word Document) and the CP4P\_Week9 original PowerPoint presentation were compressed the least. It was 0%, 1% and 3% respectively. Also macaw.jpg was compressed 5% which is still lesser to the .bmp counterpart.
* This least compression is because the files are already in lossless format or either encrypted (means there is nothing to compress or remove from the original one and entire original data is useable). Thus, these lossless files aren’t compressed or very least compressed.

🡺 Files with the **highest** ratios were compressed the **most**.   
Which file types compressed the most? Why would that be? (**10 points**)

* The text document (49%), macaw.bmp (25%), PowerPoint 97-2003 (17%) and Instruction PDF (11%) were few of the most compressed file. There is a significant difference due to the format of the file, as we can see that in the ppt. For pdf format, the difference between the two same file is 5% and for the 97-2003 format of the ppt, the difference is a massive 14%.
* This high compression ratio of the files is just because of redundancies, repetition, or just the lossy format of the file. Data is removed from this lossy format files in order to achieve a compressed file. Moreover, as I mentioned earlier, there may be repetitions in a file which contributes for its higher compression ratio, for instance, the text document above has many redundancies and thus it is compressed the most as compared to others.

**Part 3: Backup**

🡺 paste a screen shot of your backup results. (use the Screen Snip tool) **(10 points)**

I chose to create a backup of my files on OneDrive which is very versatile and easy to use for me.

Graphical user interface, text, application

Description automatically generated

From the screenshot below, we can see that I can download the uploaded file anytime in case of any data loss.

Graphical user interface, application

Description automatically generated

Your backup & restore strategy **(30 points)**

🡺 What is (or what should have been) your backup routine? How do you ensure your backup is current?

I am certainly punctual for my backup routine. By this I mean that I do backup my important files regularly. Just as the PowerPoint told us about backup, I usually create 3 backup of a single important file. That is, one in my computer as a separate copy in a different drive that I should not work upon. Another one is to a cloud server, like Sync or OneDrive or something similar like that from where I can access the files if I know my login credentials. Lastly, I do create backup at a remote location, entirely at a separate place (hard backup) like copying my files on a thumb drive or a hard disk. The time for performing these backups depends upon the importance of my files. If there is something which is very vital to me, I would backup those files right away. And if not, I’ll backup those in my scheduled backup which I perform nearly every 30 days.

The most important thing that I do for checking whether my backups are current and reliable in case of an emergency or not is by restoring a few files and checking them that are they actually working and in a good shape or not.

🡺 How does your backup routine address the three characteristics of a real backup and fulfill the 3-2-1 backup check?

In my opinion, my routine backup does address the three characteristics which is 3-2-1 backup. To justify that, I store my data on a hard disk or an external drive which is a remote backup. Next, I do backup on cloud which in some cases can be considered as a local backup. And lastly I keep two copies on my PC which is, 1 of them is the active file on which I can do the edit and other one is a copy on a separate drive just in case a drive fails functioning.

🡺 Now that you have a backup *but no laptop*, how will you access and work with the current version of your backed up files? What is your restore/recovery strategy?

In case of not having laptop, one way to restore my files is by recovering it from cloud such as OneDrive. From a cloud server, I can recover my data from anywhere in the world unless I have my credentials and an internet connection to access those files and recover it. Secondly, if I have a backup performed on a removable/external drive, I can use that at anytime too. But, as I mentioned earlier, I need to regularly by doing a drill backup whether my backup is reliable and current or not so that I can be stress free about my files.

🡺 How long would this all take…and what if you a had a big assignment due tomorrow?

Well, for me backup is one of the most boring task. That is the reason why I love the automatic cloud backup, which just sync all the files for in the background without even doing anything. And yes, backup on a remote location does take a lot of time to transfer. That is the reason why we can compress our file and backup it to cloud so that it can reduce the size to atleast 30%, thus backup can be performed faster. If I have a big assignment due tomorrow, I would probably leave the backup and focus on my assignment first just because backups can take a lot of times and I must complete the important tasks first.