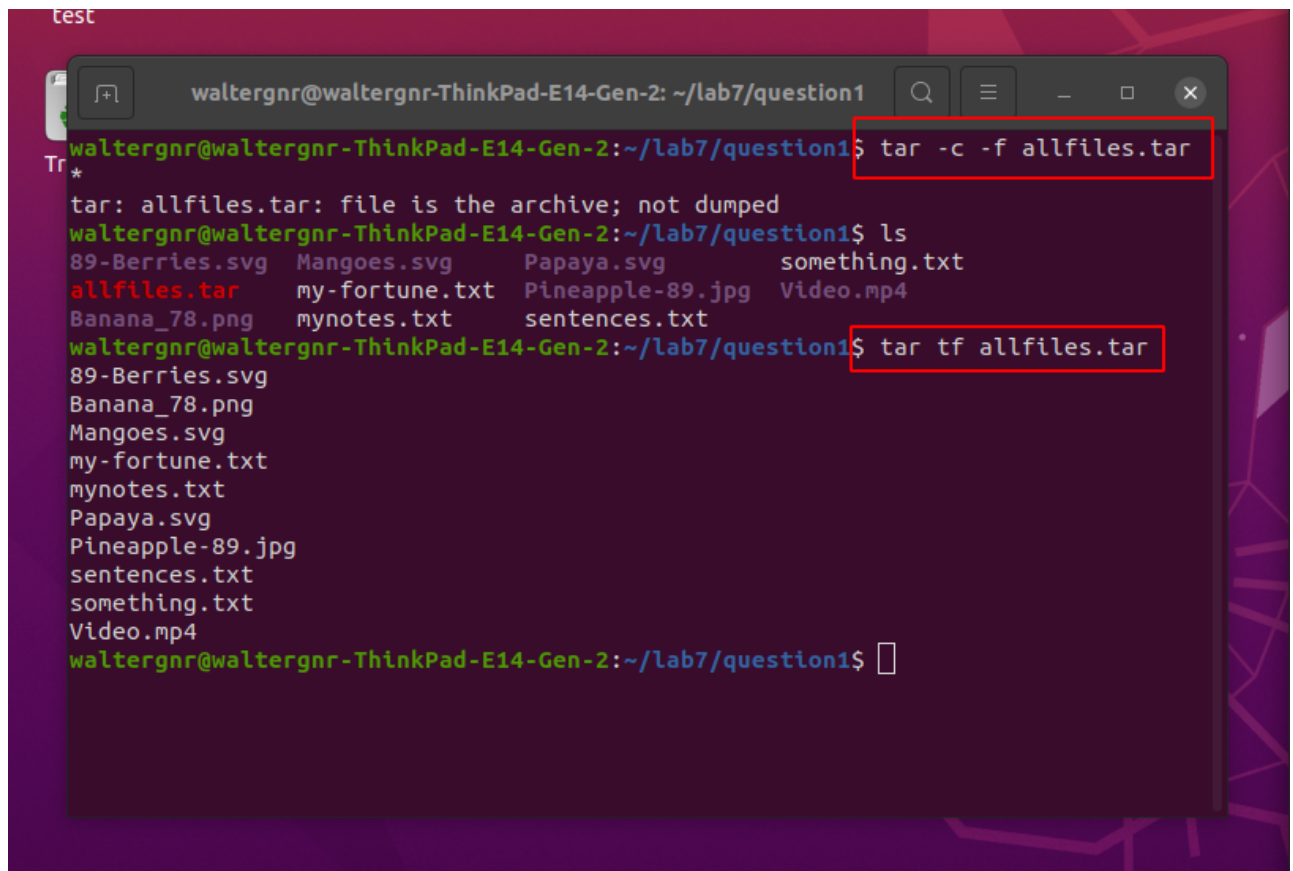


Lab 7 | Managing Data

Question 1 | Tar Utility

1. In the `question1` directory, you will find a bunch of files. Create an archive called `allfiles.tar` that includes:
 1. All text files
 2. All images that have a number in their file names
 3. All video files
2. List all the members of the archive.

A terminal window titled 'waltergnr@waltergnr-ThinkPad-E14-Gen-2: ~/lab7/question1' is shown. The user enters the command 'tar -c -f allfiles.tar' which results in an error: 'tar: allfiles.tar: file is the archive; not dumped'. The user then enters 'ls' to list the directory contents, showing files like '89-Berries.svg', 'Mangoes.svg', 'Papaya.svg', 'something.txt', 'allfiles.tar', 'my-fortune.txt', 'Pineapple-89.jpg', 'Video.mp4', 'Banana_78.png', 'mynotes.txt', and 'sentences.txt'. Finally, the user enters 'tar tf allfiles.tar' to list the contents of the archive, which outputs the same list of files as the 'ls' command.

```
waltergnr@waltergnr-ThinkPad-E14-Gen-2: ~/lab7/question1$ tar -c -f allfiles.tar
tar: allfiles.tar: file is the archive; not dumped
waltergnr@waltergnr-ThinkPad-E14-Gen-2:~/lab7/question1$ ls
89-Berries.svg  Mangoes.svg      Papaya.svg       something.txt
allfiles.tar    my-fortune.txt   Pineapple-89.jpg Video.mp4
Banana_78.png   mynotes.txt      sentences.txt
waltergnr@waltergnr-ThinkPad-E14-Gen-2:~/lab7/question1$ tar tf allfiles.tar
89-Berries.svg
Banana_78.png
Mangoes.svg
my-fortune.txt
mynotes.txt
Papaya.svg
Pineapple-89.jpg
sentences.txt
something.txt
Video.mp4
waltergnr@waltergnr-ThinkPad-E14-Gen-2:~/lab7/question1$
```

3. Create another text file with some text. Use the command `lorem` to generate the text and then output redirection to save it to a file. If the `lorem` command does not work, it means that you need to install it. The package name is: `libtext-lorem-perl` If the package is not available use the following command and redirect its output to a file: `curl http://metaphorpsum.com/sentences/5`
4. Add the new file to the archive.

5. List all the members of the archive.

```
waltergnr@waltergnr-ThinkPad-E14-Gen-2:~/lab7/question1$ curl http://metaphorpsum.com/sentences/5 > filedownloaded.txt
% Total    % Received % Xferd  Average Speed   Time    Time     Current
           Dload  Upload   Total     Spent    Left     Speed
100  310    0  310    0    0   1009      0 --:--:-- --:--:-- --:--:-- 1006
waltergnr@waltergnr-ThinkPad-E14-Gen-2:~/lab7/question1$ tar -r filedownloaded.txt allfiles.tar
tar: Options '-Ar' are incompatible with '-f -'
Try 'tar --help' or 'tar --usage' for more information.
waltergnr@waltergnr-ThinkPad-E14-Gen-2:~/lab7/question1$ tar rf allfiles.tar filedownloaded.txt
waltergnr@waltergnr-ThinkPad-E14-Gen-2:~/lab7/question1$ tar tf allfiles.tar
89-Berries.svg
Banana_78.png
Mangoes.svg
my-fortune.txt
mynotes.txt
Papaya.svg
Pineapple-89.jpg
sentences.txt
something.txt
Video.mp4
filedownloaded.txt
waltergnr@waltergnr-ThinkPad-E14-Gen-2:~/lab7/question1$
```

Question 2 | Cpio Utility

1. Move the `allfiles.tar` archive from question 1 to the question2 directory and extract all the files.
2. Remove the archive and create a new archive with cpio of all the files.

```
1 student@student-VirtualBox:~/CIS-106/lab7/question1$ mv allfiles.tar ../question
2 /
1 student@student-VirtualBox:~/CIS-106/lab7/question1$ cd ../question2/
2 student@student-VirtualBox:~/CIS-106/lab7/question2$ cpio -iv < allfiles.tar
2 89-Berries.svg
2 Banana_78.png
2 Mangoes.svg
2 my-fortune.txt
2 mynotes.txt
2 Papaya.svg
3 Pineapple-89.jpg
3 sentences.txt
3 something.txt
4 Video.mp4
4 filedownloaded.txt
4 10789 blocks
4 student@student-VirtualBox:~/CIS-106/lab7/question2$ rm allfiles.tar
```

3. Create a tar archive with cpio of all the files including the cpio archive.
4. Remove all the files except the tar archive.

5. Extract all the archive using cpio

```

student@student-VirtualBox:~/CIS-106/lab7/question2$ ls | cpio -ovH tar -F cpiofiles.tar
89-Berries.svg
Banana_78.png
filedownloaded.txt
Mangoes.svg
my-fortune.txt
mynotes.txt
Papaya.svg
Pineapple-89.jpg
sentences.txt
something.txt
Video.mp4
10790 blocks
student@student-VirtualBox:~/CIS-106/lab7/question2$ rm -v !("cpiofiles.tar")
removed '89-Berries.svg'
removed 'Banana_78.png'
removed 'filedownloaded.txt'
removed 'Mangoes.svg'
removed 'my-fortune.txt'
removed 'mynotes.txt'
removed 'Papaya.svg'
removed 'Pineapple-89.jpg'
removed 'sentences.txt'
removed 'something.txt'
removed 'Video.mp4'
student@student-VirtualBox:~/CIS-106/lab7/question2$ cpio -iv < cpiofiles.tar
89-Berries.svg
Banana_78.png
filedownloaded.txt
Mangoes.svg
my-fortune.txt
mynotes.txt
Papaya.svg
Pineapple-89.jpg
sentences.txt
something.txt
Video.mp4
10789 blocks
student@student-VirtualBox:~/CIS-106/lab7/question2$ █

```

Question 3 | Gzip, bzip2, xz

1. In the question3 directory you will find 1 file called `mynotes.txt`. What is the size of this file?
2. Compress `mynotes.txt` using gzip keeping the original file.
3. Compress `mynotes.txt` using bzip2 keeping the original file.
4. Compress `mynotes.txt` using xz keeping the original file.
5. Long list all the files. Which tool gave you the best compression?

```

student@student-VirtualBox: ~/CIS-106/lab7/question3
student@student-VirtualBox:~/CIS-106/lab7/question3$ gzip -k mynotes.txt
student@student-VirtualBox:~/CIS-106/lab7/question3$ bzip2 -k mynotes.txt
student@student-VirtualBox:~/CIS-106/lab7/question3$ xz -k mynotes.txt
student@student-VirtualBox:~/CIS-106/lab7/question3$ ls -lh
total 40K
-rw-rw-r-- 1 student student 13K Dec 15 02:04 mynotes.txt
-rw-rw-r-- 1 student student 4.2K Dec 15 02:04 mynotes.txt.bz2
-rw-rw-r-- 1 student student 4.4K Dec 15 02:04 mynotes.txt.gz
-rw-rw-r-- 1 student student 4.4K Dec 15 02:04 mynotes.txt.xz
student@student-VirtualBox:~/CIS-106/lab7/question3$ █

```

Question 4 | Zip, 7zip and Rar

1. Decompress all the compressed files from question 3 in the `question4` directory. Make sure to rename the file after decompressing them.
2. Using zip, create a zip archive of all the files.

```

student@student-VirtualBox: ~/CIS-106/lab7/question4$
student@student-VirtualBox:~/CIS-106/lab7/question4$ gzip -dkc < ../question3/mynotes.txt.
mynotes.txt.bz2 mynotes.txt.gz mynotes.txt.xz
student@student-VirtualBox:~/CIS-106/lab7/question4$ gzip -dkc < ../question3/mynotes.txt.gz> mynotes.txt
student@student-VirtualBox:~/CIS-106/lab7/question4$ bzip2 -dkc < ../question3/mynotes.txt.bz2> mynotesbz.txt
student@student-VirtualBox:~/CIS-106/lab7/question4$ xz -dkc < ../question3/mynotes.txt.xz> mynotesxz.txt
student@student-VirtualBox:~/CIS-106/lab7/question4$ ls
mynotesbz.txt mynotes.txt mynotesxz.txt
student@student-VirtualBox:~/CIS-106/lab7/question4$ zip mynoteszip.zip mynotesbz.txt mynotes.txt mynotesxz.txt
  adding: mynotesbz.txt (deflated 65%)
  adding: mynotes.txt (deflated 65%)
  adding: mynotesxz.txt (deflated 65%)

```

3. Create a 7zip archive of all the files.

```

student@student-VirtualBox:~/CIS-106/lab7/question4$ man 7z
student@student-VirtualBox:~/CIS-106/lab7/question4$ 7z -a mynotes
mynotesbz.txt mynotes.txt mynotesxz.txt mynoteszip.zip
student@student-VirtualBox:~/CIS-106/lab7/question4$ 7z
a b d e l t u x
student@student-VirtualBox:~/CIS-106/lab7/question4$ 7z a mynotes7z.7z mynotesbz.txt mynotes.txt mynotesxz.txt

7-Zip [64] 16.02 : Copyright (c) 1999-2016 Igor Pavlov : 2016-05-21
p7zip Version 16.02 (locale=en_US.UTF-8,Utf16=on,HugeFiles=on,64 bits,2 CPUs Intel(R) Core(TM) i9-9900K CPU @ 3.60GHz (906EC),ASM,AES-NI)

Scanning the drive:
3 files, 38262 bytes (38 KiB)

Creating archive: mynotes7z.7z

Items to compress: 3

Files read from disk: 3
Archive size: 4603 bytes (5 KiB)
Everything is OK
student@student-VirtualBox:~/CIS-106/lab7/question4$ ls
mynotes7z.7z mynotesbz.txt mynotes.txt mynotesxz.txt mynoteszip.zip

```

4. Create a rar archive using 7zip of all the files.
5. Long list all the archives. Which one gave you the best compression ratio?

```

student@student-VirtualBox:~/CIS-106/lab7/question4$ rar a mynotesrar.rar mynotesxz.txt mynotes.txt mynotesbz.txt

RAR 5.50 Copyright (c) 1993-2017 Alexander Roshal 11 Aug 2017
Trial version Type 'rar -?' for help

Evaluation copy. Please register.

Creating archive mynotesrar.rar

Adding mynotesxz.txt OK
Adding mynotes.txt OK
Adding mynotesbz.txt OK
Done
student@student-VirtualBox:~/CIS-106/lab7/question4$ ls -lh
total 88K
-rw-rw-r-- 1 student student 4.5K Dec 15 02:21 mynotes7z.7z
-rw-rw-r-- 1 student student 13K Dec 15 02:11 mynotesbz.txt
-rw-rw-r-- 1 student student 14K Dec 15 02:26 mynotesrar.rar
-rw-rw-r-- 1 student student 13K Dec 15 02:10 mynotes.txt
-rw-rw-r-- 1 student student 13K Dec 15 02:12 mynotesxz.txt
-rw-rw-r-- 1 student student 14K Dec 15 02:15 mynoteszip.zip
student@student-VirtualBox:~/CIS-106/lab7/question4$

```