Контрольні запитання:

1. Надайте порівняльну характеристику процесам стискання та архівування.

Archiving: Combines multiple files into one, which eliminates the overhead in individual files and makes the files easier to transmit.

Compression: Makes the files smaller by removing redundant information. Compression reduces the amount of data needed to store or transmit a file while storing it in such a way that the file can be restored. And archiving solves the problem of when you had multiple files to send to someone, you could compress each one individually and you'd have less total data than if you were sending uncompressed files, but you're still dealing with a lot of files at once.

2. Які програми, окрім наведених в роботі, можуть використовуватись для стискання та архівування файлів та каталогів в ОС Linux? Наведіть приклади та їх короткий опис.

PeaZip

1. Two Top Features of PeaZip: Use it as a portable program without requiring it to be installed. And it can password protect your file.

You can use PeaZip to unzip files free and extract content from over 180 archive formats. Some of these file formats are used commonly, while others are rarely used. You can also use this zip file opener free to create new archives in over 10 formats. You can also password protect the files and encrypt them for added security.

LZMA

1. LZMA is another command-line compression utility often found in Linux distros. It’s the compression algorithm used by 7-Zip.

3. Порівняйте алгоритми стискання, що використовуються в командах (програмах), використовуваних в Linux. Які з алгоритмів можна вважати найшвидшим та найефективнішим?

The compression algorithm is a procedure the computer uses to encode the original file, and as a result, make it smaller. Most image formats, such as GIF, PNG, and JPEG, implement some form of compression. JPEGs use lossy compression( lossy compression often benefits media because it results in smaller file sizes and people can't tell the difference between the original and the version with the changed data), while GIFs and PNGs are compressed but lossless. A lower quality results in a smaller file, but after decompression, you may notice artifacts such as rough edges or discolorations. High quality will look much like the original image, but the file size will be closer to the original.

So, I think that is one of the most efficient and fastest methods of compression with lossy - JPEG - although it takes into account certain perceptual features of images, causes quite noticeable loss in image quality. Other methods, which are based on a more complex intellectual analysis of information, are effective only for certain types of images, and require significant computing resources for compression.

4. Опишіть програмні засоби для стискання та архівування, що можуть бути використані у вашому мобільному телефоні.

The following compression and archiving software can be used on my Android: 7Zipper, ZArchiver, RAR, ALZip, AndroZip, etc.

* 7Zipper - designed to archive and expand 7Zip files. Also, 7Zipper can also decompress zip, alz, tar.gz, tar.bz2, gz, bz2, rar, jar, 7z, lzh, allowing you to create zip, 7z and jar archives. The application will also allow you to view the contents of the archive.
* List of supported ZArchiver archive extensions - 7z (7zip), zip, bzip2 (bz2), gzip (gz), XZ and tar. But you can unpack the archive in the following formats - 7z (7zip), zip, rar, rar5, bzip2, gzip, XZ, iso, tar, arj, cab, lzh, lha, lzma, xar, tgz, tbz, Z, deb, rpm, zipx, mtz, chm, dmg, cpio, cramfs, img (fat, ntfs, ubf), wim, ecm, arc (freearc), lzip, thus offering users a wide choice of file types. ZArchiver has been around on Android for a long time, making it a pretty popular app overall.
* In WinRAR, you can extract files from RAR, ZIP, TAR, GZ, BZ2, XZ, 7z, ISO and ARJ formats, and archiving is only supported in RAR and ZIP formats. The app can even handle password-protected ZIP files, so you can use this app just like you would a standard archiver.
* ALZip - a specific application is a hybrid between an archiver and a file manager, offering you the best of both worlds. It can extract zip, rar, 7z, alz, tar, tbz, tbz2, tgz, lzh, jar, gz, bz, bz2, lha files and split archives of alz and rar file formats, allowing you to archive contents into zip formats.
* AndroZip allows you to create and modify archive files. Extracting or extracting existing archives is also supported. A dedicated application backup function ensures the safety of your content when moving to another device. You can use advanced search features to find your media, documents, and other files. The developer notes that the app works like an archiving app would on a computer. The best thing here is that the program can even support encrypted ZIP file formats, which are often not supported by regular archiving programs.

5. Опишіть та порівняйте програмні засоби для стискання та (де)архівування даних у ОС сімейства Windows.

Some software tools for data compression and (de)archiving in the Windows operating system:

* WinZip - The program is actually a standard among programs of a similar class. It has all the necessary functions, has a convenient, clear interface. If you download a file from the Internet, there is a high probability that it is a zip archive.WinZip has built-in tools for working with archives of other formats (tar, gzip, UUEncode, XXencode, BinHex, Mime). WinZip can work with archives created by ARJ, LZH or ARC DOS archivers.
* WinRAR is an improved version of the archiver, which has a convenient graphical shell. WinRAR can create not only archives of its own format (files with the extension rar), but also zip. And you can "retrieve" files from arj, cab, lzh, tar, gz, ace, uue archives. And to work with cab, arj and lzh-archives, you don't even need these archivers on your computer; WinRAR has a built-in module for this. In terms of file compression, WinRAR surpasses WinZIP and even ARJ. In addition, a special algorithm for working with multimedia files: sound and graphics has appeared in recent versions.
* 7-Zip is a high compression file archiver. At his place high compression ratio in 7z format using LZMA and LZMA2; supported formats (more details can be found here): Archiving / extraction: 7z, XZ, BZIP2, GZIP, TAR, ZIP and WIM; Extract only: AR, ARJ, CAB, CHM, CPIO, CramFS, DMG, EXT, FAT, GPT, HFS, IHEX, ISO, LZH, LZMA, MBR, MSI, NSIS, NTFS, QCOW2, RAR, RPM, SquashFS, UDF , UEFI, VDI, VHD, VMDK, WIM, XAR and Z. For ZIP and GZIP formats, the 7-Zip archiver offers compression that is 2-10% better than the compression provided by PKZip and WinZip archivers; Strong AES-256 encryption in 7z and ZIP formats.

6. Поясніть яким чином стиснення та архівування даних може бути використано для резервування даних. В яких ще задачах системного адміністрування воно може бути використано.

Backup - the process of creating a copy of data on a medium designed to restore data in its original location in case of damage or destruction by appropriate programs - backup data duplicators. Backup is necessary for the possibility of quick and inexpensive recovery of information in case of loss of a working copy of information for any reason. In addition, related problems are solved: duplication of data transfer and work with common documents. Backup system requirements: Reliability of information storage is ensured by the use of fail-safe equipment of storage systems, duplication of information and replacement of a lost copy with another in case of destruction of one of the copies. Ease of operation - automation.Fast implementation – simple installation and configuration of programs, quick training of users.

7. Яке призначення директорії файлу /dev/null?

/dev/null is a special file on UNIX-class systems that is the so-called “empty device”. Recording to it is successful, regardless of the amount of “recorded” information. Reading /dev/null is equivalent to reading end of file(EOF). Redirection to /dev/null is most often used to suppress the standard output(output thread) and/or error message output(diagnostics thread) of a program by redirecting them to /dev/null, such suppression is most often used in command scripts to suppress unwanted output to the console.

Висновок: В ході виконання лабораторної роботи ми отримали практичні навики роботи з командною оболонкою Bash, ознайомилися з базовими командами для архівування та стиснення даних, а також з діями при роботі з текстом у терміналі.