Linux acces: ssh (ssh <username>@host), scp (The server process is sshd)
scp requires the -r option for directories. Remote file locations are specified as user@host:path, where the path is relative to the user's home directory unless an absolute path is given.

Absolute, relative paths, navigation, file/dir manipulation commands: pwd, cd, ls, mkdir, rmdir (only empty dir), touch, rm, mv, cp
ls-a (list hidden files, i.e., starting with .), -l (long format, showing permissions), -i (shows inode number), and -r (reverse sort order). mkdir-p creates parent directories as needed. touch: updates the file's modified time rm: Removes files (or directories, if -r or -R). cp -R for recursively copying dir. -i to issue a warning before overwriting the target.

File access rights, chmod read (r=4), write (w=2), and execute (x=1) The ls -l output shows permissions; d indicates a directory, - a file, and l a symbolic link. Execute permission on a file allows running it. Execute permission on a directory allows navigating (cd) into it.

Globbing (not standard Regex Globbing occurs on unquoted command-line arguments.

*	Matches 0 or more characters.	Does not match files starting with . (hidden files).
?	Matches precisely one character.	N/A
[...]	Matches specified characters/ranges in a set.	E.g., [a-z].
[^...] or [!...]	Negates the set (matches any character NOT listed).	[!...] is POSIX compliant.
{p1,p2,...}	Brace Expansion (matches/expands each pattern).	E.g., {file1,file2}.txt.

I/O redirection, piping, text processing commands: echo, cat, head, tail, sort, tee, uniq, tr, wc

Streams	Standard Input (stdin, 0<), Standard Output (stdout, 1>), Standard Error (stderr, 2>).	Defaults: keyboard/display screen.
Redirection	< or 0<: Redirect stdin from a file.	> or 1>: Redirect stdout to a file (overwrites).
Append	>>: Redirect stdout/stderr to a file (appends).	2>: Redirect stderr to a file.
/dev/null	Output/files sent here are deleted forever.	Use command > /dev/null to discard standard output.
Piping	s1 | s2 | s3 | : Channels stdout of one program to stdin of the next.	Data flows left to right.

echo	Displays a string.	-n (no newline); -e (enable escape sequences: \n, \t, etc.).
cat	Concatenates files and displays content.	-n (prints line numbers).
head	Prints the first lines of a file (default 10).	-n *number* (prints first *number* lines).
tail	Prints the last lines of a file (default 10).	-n *number* (prints last *number* lines).
sort	Sorts input line by line (reads stdin if no file given).	-r (reverse order); -k *field1[,field2]* (sort by column).
tee	Copies stdin to stdout, and also makes a copy in *file*.	-a (append output to file).
uniq	Reports/ filters out repeated adjacent lines. Input must be sorted!.	-c (count occurrences); -d (output just duplicate lines); -u (output just unique lines).
tr	Translates/del char from stdin to stdout. Does not take file input.	-C (complement characters in *string1*); tr -d string1 (deletes characters).
wc	Count lines, words, bytes, or characters.	-l (lines); -w (words); -c (bytes); -m (characters).

grep	Search for pattern in files and print matched lines.	`grep [-i
Key Flags	-i (ignore case); -c (total count of lines matched); -l (return names of matched files); -n (show line numbers); -v (return lines that do not match pattern); -o (print only matching parts); -R (read files recursively).	-E (Interpret pattern as Extended Regular Expression).
ERE Repetition	. (any char); ? (0 or 1 preceding item); * (0 or more preceding items); + (1 or more preceding items); {n,m} (interval expression).	
ERE Structure	^ (line start); $ (line end). [A-Z] (bracket expression). \b (match empty string at edge of word). "^$" -> match space	Precedence: Repetition > Concatenation > Alternation (|).

Mechanism	Syntax	Expansion/Interpretation Allowed
Escape	\	Removes special meaning from the next single character (except \newline for continuation).
Single Quotes	'text'	None. All characters treated as literals; variables are NOT expanded.
Double Quotes	"text"	$ (variable expansion), *, and ` (command substitution) are allowed.
Command Sub.	$(command) or `command`.	Replaced by the output of the executed command.

`$#`: number of command line arguments supplied to the script. `$*`: All the arguments treated as one double quoted string. `$@`: All the args treated as individual double quoted strings. Can be used to loop through variables in for loops.`$$`: The process id of the current shell

if statement	if TEST; then ... [elif TEST; then ...] [else ...] fi.	Exit status 0 = TRUE/Successful Test. Must include spaces around brackets, e.g., [$VAR -gt 10].
for loop	for VAR in list; do ... done.	List can be: {1..10..2}, $(ls *.txt), or C-style for ((i=0; ...)).
while loop	while TEST; do ... done.	Uses the same TEST syntax as if statements.

kill: Terminates processes by PID (sends SIGTERM by default). also send signals SIGTSTP (pause) |SIGCONT (resume).
pkill: Sends signals based on the process name

File System	Composed of Files (data blocks), Inodes, and Directory Structure.	ls -i shows inode number.
Inode	Structure storing file metadata (permissions, owner, size, pointers to data blocks). Does NOT contain the filename.	Fixed number of inodes per file system. Hard links share the same inode.
Directory	Stores a table of Filenames and corresponding Inode Numbers.	N/A
Symbolic Link	Soft links/shortcuts. Independent files containing the path to the target.	ln -s [target file] [link name]. Deleting target causes a broken link. Identified by l flag in ls -l.
Hard Link	Aliases to the same single file; independent entries pointing to the same inode.	ln [target file] [hard link name]. Data blocks deleted only when the last hard link is deleted.

char	Always 1 byte. Can be signed unsigned; use unsigned char for positive-only values.	N/A
Unsigned Int	Follows base 2 system (0 to 2^W-1).	N/A
Signed Int (Two's Comp.)	Most common signed integer representation. Range: -2^N-1 to 2^N-1-1 (N bits).	Eliminates two zeros; simplifies arithmetic (subtraction = addition of negative). Conversion shortcut for negative: Invert bits, then add 1.
IEEE Floating Point	32-bit Single-Precision (float). Value reconstructed by $Value=(-1)^{Sign}\times(1.Fraction)\times2^{(Exponent-127)}$.	Sign (1 bit). Exponent (8 bits): Uses bias of 127. Fraction (23 bits): Implies a leading '1' (hidden bit) for 24 bits of precision. Not Associative.
Special Floats	Zero: E & F all zeros. Denormalized: E all zeros, F non-zero (for very small numbers). Infinity: E all ones, F all zeros. NaN: E all ones, F non-zero.	

Library Code	Copied into executable.	Loaded at runtime (executable has references).
Executable Size	Larger.	Smaller. (Default in most systems).
Dependencies	None needed (portable).	Libraries must be present on system.
Updates/Bugs	Must recompile program.	Automatic (just update the library).
Memory	Multiple programs waste memory (each has own copy).	Multiple programs share a single copy in memory.
Linux Extension	.a (Archive).	.so (Shared Object).

Linker Driver (gcc) -L: specify directories for library files. -l: specify libraries to link with. -I: specify directories for header files.