AUTHOR : Ankan Mookherjee

Id: axm3244

-------------------------------------------------------------------------------

DEVELOPMENT

The package contains 5 files apart from this file.

1)remoteCMD.cpp contains main function.

2)SSHFunctions.h contains header files and signatures of methods in

SSHFunctions.cpp. This file links SSHFunctions.cpp to remoteCMD.cpp.

3)SSHFunctions.cpp contains methods to enable SSH.

4)Makefile for code execution

5)remoteCMD which is the executable file

The main function accepts command line argument. However the total number

of arguments accepted has be exactly equal to 2.

The first one is the host-name followed by the command to be executed in

double quotes.

After thes session was extablished in session\_run method. Hostname

was passed to it.Initially I hardcoded to check its correct functioning.

However later in the development phase, I used parameters from the

command line argument to be sent dynamically to the method.

Port number and command line were also sent in the same fasion. Owing to

the signature which was const char\* . I faced some issues but it got resolved

by matching the signatures of the parameters I used for accepting and passing

the variables.

Now while authentication, I tried with remote authentication however it did not

work. After looking at the error message which required KEYBOARD INTERACTIVE

AUTHENTICATION I coded for keyboard interactive authentication.

After successful connection via Keyboard Interactive Authentication I used

remote\_request\_exec() to pass on the command and reader function to read output.

Overall the development was procedural and few logical problems which came

on the way got resolved with testing and passing hardcoding and later

replacing them with variables along the way.

Error Mechanism was gradually added although command line specification and

incorrect or incomplete command implementation was added to the program in

the end phase of the development.

-------------------------------------------------------------------------------

MANUAL EXECUTION OF CODE

$ g++ -o remoteCMD remoteCMD.cpp SSHFunctions.cpp -lssh

OUTPUT REDERCTION

$ g++ -o remoteCMD remoteCMD.cpp SSHFunctions.cpp -lssh >> readme.txt

-------------------------------------------------------------------------------

MAKE FILE

Instructions :

Type gmakemake > Makefile inside Project directory.

Make sure the Project houses all the required files to be compiled.

$ gmakemake > Makefile

pico Makefile :

In makefile Alter

CLIBFLAGS= -lm -lssh

CCLIBFLAGS= -lssh

Save the file

Now run make

$ make

remoteCMD output generated.

-------------------------------------------------------------------------------

Version Controlling

I used RCS version controlling. This is what I did check in and check out files.

I used this command to check in my versions.

//Make an RCS directory to store the checked in files

$ mkdir RCS

$ ci remoteCMD.cpp SSHFunctions.cpp SSHFunctions.h

>> Enter Comments and Lock with a single '.'

>> .

Done

Revision Version Locked

I used this command to check out my version.

It used to revert to the last version I had checked in.

$ co -l remoteCMD.cpp SSHFunctions.cpp SSHFunctions.h

Unlock the version.

Lock it for others to use.

If I checked it in with the help of ci command i used to get saved as my most recent version.

-------------------------------------------------------------------------------

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Test Cases Delivered with Output Redirection.

Test Case 1:

$ ./remoteCMD idaho "ls -l"

total 20

drwx------ 3 axm3244 ugrad 512 Dec 6 02:46 AI

-rw-rw-rw- 1 axm3244 ugrad 6038 Nov 7 20:23 C:\nppdf32Log\debuglog.txt

drwx------ 3 axm3244 ugrad 512 Dec 8 22:37 CPP

drwx------ 2 axm3244 ugrad 512 Dec 6 17:41 CPPLecture

drwx------ 2 axm3244 ugrad 512 Aug 29 17:07 Courses

drwxr-xr-x 2 axm3244 ugrad 512 Nov 13 16:20 Desktop

drwx------ 2 axm3244 ugrad 512 Nov 13 16:12 Documents

drwx------ 2 axm3244 ugrad 512 Dec 6 02:46 Downloads

drwx------ 16 axm3244 ugrad 512 Nov 13 16:17 Library

drwx------ 2 axm3244 ugrad 512 Nov 13 16:12 Movies

drwx------ 2 axm3244 ugrad 512 Nov 13 16:12 Music

drwx------ 2 axm3244 ugrad 512 Nov 13 16:12 Pictures

drwxr-xr-x 3 axm3244 ugrad 512 Nov 13 16:12 Public

drwx------ 2 axm3244 ugrad 512 Dec 11 09:19 SSHApplication

drwxr-xr-x 2 axm3244 ugrad 512 Aug 29 17:07 public\_html

-------------------------------------------------------------------------------

Test Case 2:

$ ./remoteCMD vermont "man grep"

GREP(1) GREP(1)

NAME

grep, egrep, fgrep, rgrep - print lines matching a pattern

SYNOPSIS

grep [OPTIONS] PATTERN [FILE...]

grep [OPTIONS] [-e PATTERN | -f FILE] [FILE...]

DESCRIPTION

grep searches the named input FILEs (or standard input if no files are

named, or if a single hyphen-minus (-) is given as file name) for lines

containing a match to the given PATTERN. By default, grep prints the

matching lines.

In addition, three variant programs egrep, fgrep and rgrep are

available. egrep is the same as grep -E. fgrep is the same as

grep -F. rgrep is the same as grep -r. Direct invocation as either

egrep or fgrep is deprecated, but is provided to allow historical

applications that rely on them to run unmodified.

OPTIONS

Generic Program Information

--help Print a usage message briefly summarizing these command-line

options and the bug-reporting address, then exit.

-V, --version

Print the version number of grep to the standard output stream.

This version number should be included in all bug reports (see

below).

Matcher Selection

-E, --extended-regexp

Interpret PATTERN as an extended regular expression (ERE, see

below). (-E is specified by POSIX.)

-F, --fixed-strings

Interpret PATTERN as a list of fixed strings, separated by

newlines, any of which is to be matched. (-F is specified by

POSIX.)

-G, --basic-regexp

Interpret PATTERN as a basic regular expression (BRE, see

below). This is the default.

-P, --perl-regexp

Interpret PATTERN as a Perl regular expression (PCRE, see

below). This is highly experimental and grep -P may warn of

unimplemented features.

Matching Control

-e PATTERN, --regexp=PATTERN

Use PATTERN as the pattern. This can be used to specify

multiple search patterns, or to protect a pattern beginning with

a hyphen (-). (-e is specified by POSIX.)

-f FILE, --file=FILE

Obtain patterns from FILE, one per line. The empty file

contains zero patterns, and therefore matches nothing. (-f is

specified by POSIX.)

-i, --ignore-case

Ignore case distinctions in both the PATTERN and the input

files. (-i is specified by POSIX.)

-v, --invert-match

Invert the sense of matching, to select non-matching lines. (-v

is specified by POSIX.)

-w, --word-regexp

Select only those lines containing matches that form whole

words. The test is that the matching substring must either be

at the beginning of the line, or preceded by a non-word

constituent character. Similarly, it must be either at the end

of the line or followed by a non-word constituent character.

Word-constituent characters are letters, digits, and the

underscore.

-x, --line-regexp

Select only those matches that exactly match the whole line.

(-x is specified by POSIX.)

-y Obsolete synonym for -i.

General Output Control

-c, --count

Suppress normal output; instead print a count of matching lines

for each input file. With the -v, --invert-match option (see

below), count non-matching lines. (-c is specified by POSIX.)

--color[=WHEN], --colour[=WHEN]

Surround the matched (non-empty) strings, matching lines,

context lines, file names, line numbers, byte offsets, and

separators (for fields and groups of context lines) with escape

sequences to display them in color on the terminal. The colors

are defined by the environment variable GREP\_COLORS. The

deprecated environment variable GREP\_COLOR is still supported,

but its setting does not have priority. WHEN is never, always,

or auto.

-L, --files-without-match

Suppress normal output; instead print the name of each input

file from which no output would normally have been printed. The

scanning will stop on the first match.

-l, --files-with-matches

Suppress normal output; instead print the name of each input

file from which output would normally have been printed. The

scanning will stop on the first match. (-l is specified by

POSIX.)

-m NUM, --max-count=NUM

Stop reading a file after NUM matching lines. If the input is

standard input from a regular file, and NUM matching lines are

output, grep ensures that the standard input is positioned to

just after the last matching line before exiting, regardless of

the presence of trailing context lines. This enables a calling

process to resume a search. When grep stops after NUM matching

lines, it outputs any trailing context lines. When the -c or

--count option is also used, grep does not output a count

greater than NUM. When the -v or --invert-match option is also

used, grep stops after outputting NUM non-matching lines.

-o, --only-matching

Print only the matched (non-empty) parts of a matching line,

with each such part on a separate output line.

-q, --quiet, --silent

Quiet; do not write anything to standard output. Exit

immediately with zero status if any match is found, even if an

error was detected. Also see the -s or --no-messages option.

(-q is specified by POSIX.)

-s, --no-messages

Suppress error messages about nonexistent or unreadable files.

Portability note: unlike GNU grep, 7th Edition Unix grep did not

conform to POSIX, because it lacked -q and its -s option behaved

like GNU grep's -q option. USG-style grep also lacked -q but

its -s option behaved like GNU grep. Portable shell scripts

should avoid both -q and -s and should redirect standard and

error output to /dev/null instead. (-s is specified by POSIX.)

Output Line Prefix Control

-b, --byte-offset

Print the 0-based byte offset within the input file before each

line of output. If -o (--only-matching) is specified, print the

offset of the matching part itself.

-H, --with-filename

Print the file name for each match. This is the default when

there is more than one file to search.

-h, --no-filename

Suppress the prefixing of file names on output. This is the

default when there is only one file (or only standard input) to

search.

--label=LABEL

Display input actually coming from standard input as input

coming from file LABEL. This is especially useful when

implementing tools like zgrep, e.g., gzip -cd foo.gz | grep

--label=foo -H something. See also the -H option.

-n, --line-number

Prefix each line of output with the 1-based line number within

its input file. (-n is specified by POSIX.)

-T, --initial-tab

Make sure that the first character of actual line content lies

on a tab stop, so that the alignment of tabs looks normal. This

is useful with options that prefix their output to the actual

content: -H,-n, and -b. In order to improve the probability

that lines from a single file will all start at the same column,

this also causes the line number and byte offset (if present) to

be printed in a minimum size field width.

-u, --unix-byte-offsets

Report Unix-style byte offsets. This switch causes grep to

report byte offsets as if the file were a Unix-style text file,

i.e., with CR characters stripped off. This will produce

results identical to running grep on a Unix machine. This

option has no effect unless -b option is also used; it has no

effect on platforms other than MS-DOS and MS-Windows.

-Z, --null

Output a zero byte (the ASCII NUL character) instead of the

character that normally follows a file name. For example, grep

-lZ outputs a zero byte after each file name instead of the

usual newline. This option makes the output unambiguous, even

in the presence of file names containing unusual characters like

newlines. This option can be used with commands like find

-print0, perl -0, sort -z, and xargs -0 to process arbitrary

file names, even those that contain newline characters.

Context Line Control

-A NUM, --after-context=NUM

Print NUM lines of trailing context after matching lines.

Places a line containing a group separator (--) between

contiguous groups of matches. With the -o or --only-matching

option, this has no effect and a warning is given.

-B NUM, --before-context=NUM

Print NUM lines of leading context before matching lines.

Places a line containing a group separator (--) between

contiguous groups of matches. With the -o or --only-matching

option, this has no effect and a warning is given.

-C NUM, -NUM, --context=NUM

Print NUM lines of output context. Places a line containing a

group separator (--) between contiguous groups of matches. With

the -o or --only-matching option, this has no effect and a

warning is given.

File and Directory Selection

-a, --text

Process a binary file as if it were text; this is equivalent to

the --binary-files=text option.

--binary-files=TYPE

If the first few bytes of a file indicate that the file contains

binary data, assume that the file is of type TYPE. By default,

TYPE is binary, and grep normally outputs either a one-line

message saying that a binary file matches, or no message if

there is no match. If TYPE is without-match, grep assumes that

a binary file does not match; this is equivalent to the -I

option. If TYPE is text, grep processes a binary file as if it

were text; this is equivalent to the -a option. Warning: grep

--binary-files=text might output binary garbage, which can have

nasty side effects if the output is a terminal and if the

terminal driver interprets some of it as commands.

-D ACTION, --devices=ACTION

If an input file is a device, FIFO or socket, use ACTION to

process it. By default, ACTION is read, which means that

devices are read just as if they were ordinary files. If ACTION

is skip, devices are silently skipped.

-d ACTION, --directories=ACTION

If an input file is a directory, use ACTION to process it. By

default, ACTION is read, which means that directories are read

just as if they were ordinary files. If ACTION is skip,

directories are silently skipped. If ACTION is recurse, grep

reads all files under each directory, recursively; this is

equivalent to the -r option.

--exclude=GLOB

Skip files whose base name matches GLOB (using wildcard

matching). A file-name glob can use \*, ?, and [...] as

wildcards, and \ to quote a wildcard or backslash character

literally.

--exclude-from=FILE

Skip files whose base name matches any of the file-name globs

read from FILE (using wildcard matching as described under

--exclude).

--exclude-dir=DIR

Exclude directories matching the pattern DIR from recursive

searches.

-I Process a binary file as if it did not contain matching data;

this is equivalent to the --binary-files=without-match option.

--include=GLOB

Search only files whose base name matches GLOB (using wildcard

matching as described under --exclude).

-R, -r, --recursive

Read all files under each directory, recursively; this is

equivalent to the -d recurse option.

Other Options

--line-buffered

Use line buffering on output. This can cause a performance

penalty.

--mmap If possible, use the mmap(2) system call to read input, instead

of the default read(2) system call. In some situations, --mmap

yields better performance. However, --mmap can cause undefined

behavior (including core dumps) if an input file shrinks while

grep is operating, or if an I/O error occurs.

-U, --binary

Treat the file(s) as binary. By default, under MS-DOS and MS-

Windows, grep guesses the file type by looking at the contents

of the first 32KB read from the file. If grep decides the file

is a text file, it strips the CR characters from the original

file contents (to make regular expressions with ^ and $ work

correctly). Specifying -U overrules this guesswork, causing all

files to be read and passed to the matching mechanism verbatim;

if the file is a text file with CR/LF pairs at the end of each

line, this will cause some regular expressions to fail. This

option has no effect on platforms other than MS-DOS and MS-

Windows.

-z, --null-data

Treat the input as a set of lines, each terminated by a zero

byte (the ASCII NUL character) instead of a newline. Like the

-Z or --null option, this option can be used with commands like

sort -z to process arbitrary file names.

REGULAR EXPRESSIONS

A regular expression is a pattern that describes a set of strings.

Regular expressions are constructed analogously to arithmetic

expressions, by using various operators to combine smaller expressions.

grep understands three different versions of regular expression syntax:

"basic" (BRE), "extended" (ERE) and "perl" (PRCE). In GNU grep, there

is no difference in available functionality between basic and extended

syntaxes. In other implementations, basic regular expressions are less

powerful. The following description applies to extended regular

expressions; differences for basic regular expressions are summarized

afterwards. Perl regular expressions give additional functionality,

and are documented in pcresyntax(3) and pcrepattern(3), but may not be

available on every system.

The fundamental building blocks are the regular expressions that match

a single character. Most characters, including all letters and digits,

are regular expressions that match themselves. Any meta-character with

special meaning may be quoted by preceding it with a backslash.

The period . matches any single character.

Character Classes and Bracket Expressions

A bracket expression is a list of characters enclosed by [ and ]. It

matches any single character in that list; if the first character of

the list is the caret ^ then it matches any character not in the list.

For example, the regular expression [0123456789] matches any single

digit.

Within a bracket expression, a range expression consists of two

characters separated by a hyphen. It matches any single character that

sorts between the two characters, inclusive, using the locale's

collating sequence and character set. For example, in the default C

locale, [a-d] is equivalent to [abcd]. Many locales sort characters in

dictionary order, and in these locales [a-d] is typically not

equivalent to [abcd]; it might be equivalent to [aBbCcDd], for example.

To obtain the traditional interpretation of bracket expressions, you

can use the C locale by setting the LC\_ALL environment variable to the

value C.

Finally, certain named classes of characters are predefined within

bracket expressions, as follows. Their names are self explanatory, and

they are [:alnum:], [:alpha:], [:cntrl:], [:digit:], [:graph:],

[:lower:], [:print:], [:punct:], [:space:], [:upper:], and [:xdigit:].

For example, [[:alnum:]] means the character class of numbers and

letters in the current locale. In the C locale and ASCII character set

encoding, this is the same as [0-9A-Za-z]. (Note that the brackets in

these class names are part of the symbolic names, and must be included

in addition to the brackets delimiting the bracket expression.) Most

meta-characters lose their special meaning inside bracket expressions.

To include a literal ] place it first in the list. Similarly, to

include a literal ^ place it anywhere but first. Finally, to include a

literal - place it last.

Anchoring

The caret ^ and the dollar sign $ are meta-characters that respectively

match the empty string at the beginning and end of a line.

The Backslash Character and Special Expressions

The symbols \< and \> respectively match the empty string at the

beginning and end of a word. The symbol \b matches the empty string at

the edge of a word, and \B matches the empty string provided it's not

at the edge of a word. The symbol \w is a synonym for [[:alnum:]] and

\W is a synonym for [^[:alnum:]].

Repetition

A regular expression may be followed by one of several repetition

operators:

? The preceding item is optional and matched at most once.

\* The preceding item will be matched zero or more times.

+ The preceding item will be matched one or more times.

{n} The preceding item is matched exactly n times.

{n,} The preceding item is matched n or more times.

{n,m} The preceding item is matched at least n times, but not more

than m times.

Concatenation

Two regular expressions may be concatenated; the resulting regular

expression matches any string formed by concatenating two substrings

that respectively match the concatenated expressions.

Alternation

Two regular expressions may be joined by the infix operator |; the

resulting regular expression matches any string matching either

alternate expression.

Precedence

Repetition takes precedence over concatenation, which in turn takes

precedence over alternation. A whole expression may be enclosed in

parentheses to override these precedence rules and form a

subexpression.

Back References and Subexpressions

The back-reference \n, where n is a single digit, matches the substring

previously matched by the nth parenthesized subexpression of the

regular expression.

Basic vs Extended Regular Expressions

In basic regular expressions the meta-characters ?, +, {, |, (, and )

lose their special meaning; instead use the backslashed versions \?,

\+, \{, \|, \(, and \).

Traditional egrep did not support the { meta-character, and some egrep

implementations support \{ instead, so portable scripts should avoid {

in grep -E patterns and should use [{] to match a literal {.

GNU grep -E attempts to support traditional usage by assuming that { is

not special if it would be the start of an invalid interval

specification. For example, the command grep -E '{1' searches for the

two-character string {1 instead of reporting a syntax error in the

regular expression. POSIX.2 allows this behavior as an extension, but

portable scripts should avoid it.

ENVIRONMENT VARIABLES

The behavior of grep is affected by the following environment

variables.

The locale for category LC\_foo is specified by examining the three

environment variables LC\_ALL, LC\_foo, LANG, in that order. The first

of these variables that is set specifies the locale. For example, if

LC\_ALL is not set, but LC\_MESSAGES is set to pt\_BR, then the Brazilian

Portuguese locale is used for the LC\_MESSAGES category. The C locale

is used if none of these environment variables are set, if the locale

catalog is not installed, or if grep was not compiled with national

language support (NLS).

GREP\_OPTIONS

This variable specifies default options to be placed in front of

any explicit options. For example, if GREP\_OPTIONS is

'--binary-files=without-match --directories=skip', grep behaves

as if the two options --binary-files=without-match and

--directories=skip had been specified before any explicit

options. Option specifications are separated by whitespace. A

backslash escapes the next character, so it can be used to

specify an option containing whitespace or a backslash.

GREP\_COLOR

This variable specifies the color used to highlight matched

(non-empty) text. It is deprecated in favor of GREP\_COLORS, but

still supported. The mt, ms, and mc capabilities of GREP\_COLORS

have priority over it. It can only specify the color used to

highlight the matching non-empty text in any matching line (a

selected line when the -v command-line option is omitted, or a

context line when -v is specified). The default is 01;31, which

means a bold red foreground text on the terminal's default

background.

GREP\_COLORS

Specifies the colors and other attributes used to highlight

various parts of the output. Its value is a colon-separated

list of capabilities that defaults to

ms=01;31:mc=01;31:sl=:cx=:fn=35:ln=32:bn=32:se=36 with the rv

and ne boolean capabilities omitted (i.e., false). Supported

capabilities are as follows.

sl= SGR substring for whole selected lines (i.e., matching

lines when the -v command-line option is omitted, or non-

matching lines when -v is specified). If however the

boolean rv capability and the -v command-line option are

both specified, it applies to context matching lines

instead. The default is empty (i.e., the terminal's

default color pair).

cx= SGR substring for whole context lines (i.e., non-matching

lines when the -v command-line option is omitted, or

matching lines when -v is specified). If however the

boolean rv capability and the -v command-line option are

both specified, it applies to selected non-matching lines

instead. The default is empty (i.e., the terminal's

default color pair).

rv Boolean value that reverses (swaps) the meanings of the

sl= and cx= capabilities when the -v command-line option

is specified. The default is false (i.e., the capability

is omitted).

mt=01;31

SGR substring for matching non-empty text in any matching

line (i.e., a selected line when the -v command-line

option is omitted, or a context line when -v is

specified). Setting this is equivalent to setting both

ms= and mc= at once to the same value. The default is a

bold red text foreground over the current line

background.

ms=01;31

SGR substring for matching non-empty text in a selected

line. (This is only used when the -v command-line option

is omitted.) The effect of the sl= (or cx= if rv)

capability remains active when this kicks in. The

default is a bold red text foreground over the current

line background.

mc=01;31

SGR substring for matching non-empty text in a context

line. (This is only used when the -v command-line option

is specified.) The effect of the cx= (or sl= if rv)

capability remains active when this kicks in. The

default is a bold red text foreground over the current

line background.

fn=35 SGR substring for file names prefixing any content line.

The default is a magenta text foreground over the

terminal's default background.

ln=32 SGR substring for line numbers prefixing any content

line. The default is a green text foreground over the

terminal's default background.

bn=32 SGR substring for byte offsets prefixing any content

line. The default is a green text foreground over the

terminal's default background.

se=36 SGR substring for separators that are inserted between

selected line fields (:), between context line fields,

(-), and between groups of adjacent lines when nonzero

context is specified (--). The default is a cyan text

foreground over the terminal's default background.

ne Boolean value that prevents clearing to the end of line

using Erase in Line (EL) to Right (\33[K) each time a

colorized item ends. This is needed on terminals on

which EL is not supported. It is otherwise useful on

terminals for which the back\_color\_erase (bce) boolean

terminfo capability does not apply, when the chosen

highlight colors do not affect the background, or when EL

is too slow or causes too much flicker. The default is

false (i.e., the capability is omitted).

Note that boolean capabilities have no =... part. They are

omitted (i.e., false) by default and become true when specified.

See the Select Graphic Rendition (SGR) section in the

documentation of the text terminal that is used for permitted

values and their meaning as character attributes. These

substring values are integers in decimal representation and can

be concatenated with semicolons. grep takes care of assembling

the result into a complete SGR sequence (\33[...m). Common

values to concatenate include 1 for bold, 4 for underline, 5 for

blink, 7 for inverse, 39 for default foreground color, 30 to 37

for foreground colors, 90 to 97 for 16-color mode foreground

colors, 38;5;0 to 38;5;255 for 88-color and 256-color modes

foreground colors, 49 for default background color, 40 to 47 for

background colors, 100 to 107 for 16-color mode background

colors, and 48;5;0 to 48;5;255 for 88-color and 256-color modes

background colors.

LC\_ALL, LC\_COLLATE, LANG

These variables specify the locale for the LC\_COLLATE category,

which determines the collating sequence used to interpret range

expressions like [a-z].

LC\_ALL, LC\_CTYPE, LANG

These variables specify the locale for the LC\_CTYPE category,

which determines the type of characters, e.g., which characters

are whitespace.

LC\_ALL, LC\_MESSAGES, LANG

These variables specify the locale for the LC\_MESSAGES category,

which determines the language that grep uses for messages. The

default C locale uses American English messages.

POSIXLY\_CORRECT

If set, grep behaves as POSIX.2 requires; otherwise, grep

behaves more like other GNU programs. POSIX.2 requires that

options that follow file names must be treated as file names; by

default, such options are permuted to the front of the operand

list and are treated as options. Also, POSIX.2 requires that

unrecognized options be diagnosed as "illegal", but since they

are not really against the law the default is to diagnose them

as "invalid". POSIXLY\_CORRECT also disables

\_N\_GNU\_nonoption\_argv\_flags\_, described below.

\_N\_GNU\_nonoption\_argv\_flags\_

(Here N is grep's numeric process ID.) If the ith character of

this environment variable's value is 1, do not consider the ith

operand of grep to be an option, even if it appears to be one.

A shell can put this variable in the environment for each

command it runs, specifying which operands are the results of

file name wildcard expansion and therefore should not be treated

as options. This behavior is available only with the GNU C

library, and only when POSIXLY\_CORRECT is not set.

EXIT STATUS

The exit status is 0 if selected lines are found, and 1 if not found.

If an error occurred the exit status is 2. (Note: POSIX error handling

code should check for '2' or greater.)

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PURPOSE.

BUGS

Reporting Bugs

Email bug reports to <bug-grep@gnu.org>, a mailing list whose web page

is <http://lists.gnu.org/mailman/listinfo/bug-grep>. grep's Savannah

bug tracker is located at <http://savannah.gnu.org/bugs/?group=grep>.

Known Bugs

Large repetition counts in the {n,m} construct may cause grep to use

lots of memory. In addition, certain other obscure regular expressions

require exponential time and space, and may cause grep to run out of

memory.

Back-references are very slow, and may require exponential time.

SEE ALSO

Regular Manual Pages

awk(1), cmp(1), diff(1), find(1), gzip(1), perl(1), sed(1), sort(1),

xargs(1), zgrep(1), mmap(2), read(2), pcre(3), pcresyntax(3),

pcrepattern(3), terminfo(5), glob(7), regex(7).

POSIX Programmer's Manual Page

grep(1p).

TeXinfo Documentation

The full documentation for grep is maintained as a TeXinfo manual. If

the info and grep programs are properly installed at your site, the

command

info grep

should give you access to the complete manual.

NOTES

GNU's not Unix, but Unix is a beast; its plural form is Unixen.

User Commands GNU grep 2.10 GREP(1)

-------------------------------------------------------------------------------

Test Case 2:

$ ./remoteCMD california "ps aux"

USER PID %CPU %MEM VSZ RSS TTY STAT START TIME COMMAND

root 1 0.0 0.0 10420 3328 ? Ss Nov20 0:01 /sbin/init

root 2 0.0 0.0 0 0 ? S Nov20 0:00 [kthreadd]

root 3 0.0 0.0 0 0 ? S Nov20 0:18 [ksoftirqd/0]

root 6 0.0 0.0 0 0 ? S Nov20 0:04 [migration/0]

root 7 0.0 0.0 0 0 ? S Nov20 0:04 [watchdog/0]

root 8 0.0 0.0 0 0 ? S Nov20 0:03 [migration/1]

root 10 0.0 0.0 0 0 ? S Nov20 0:13 [ksoftirqd/1]

root 12 0.0 0.0 0 0 ? S Nov20 0:03 [watchdog/1]

root 13 0.0 0.0 0 0 ? S Nov20 0:02 [migration/2]

root 15 0.0 0.0 0 0 ? S Nov20 0:13 [ksoftirqd/2]

root 16 0.0 0.0 0 0 ? S Nov20 0:03 [watchdog/2]

root 17 0.0 0.0 0 0 ? S Nov20 0:03 [migration/3]

root 19 0.0 0.0 0 0 ? S Nov20 0:11 [ksoftirqd/3]

root 20 0.0 0.0 0 0 ? S Nov20 0:03 [watchdog/3]

root 21 0.0 0.0 0 0 ? S< Nov20 0:00 [cpuset]

root 22 0.0 0.0 0 0 ? S< Nov20 0:00 [khelper]

root 23 0.0 0.0 0 0 ? S Nov20 0:00 [kdevtmpfs]

root 24 0.0 0.0 0 0 ? S< Nov20 0:00 [netns]

root 26 0.0 0.0 0 0 ? S Nov20 0:02 [sync\_supers]

root 27 0.0 0.0 0 0 ? S Nov20 0:00 [bdi-default]

root 28 0.0 0.0 0 0 ? S< Nov20 0:00 [kintegrityd]

root 29 0.0 0.0 0 0 ? S< Nov20 0:00 [kblockd]

root 30 0.0 0.0 0 0 ? S< Nov20 0:00 [ata\_sff]

root 31 0.0 0.0 0 0 ? S Nov20 0:00 [khubd]

root 32 0.0 0.0 0 0 ? S< Nov20 0:00 [md]

root 34 0.0 0.0 0 0 ? S Nov20 0:00 [khungtaskd]

root 35 0.0 0.0 0 0 ? S Nov20 0:00 [kswapd0]

root 36 0.0 0.0 0 0 ? SN Nov20 0:00 [ksmd]

root 37 0.0 0.0 0 0 ? SN Nov20 0:00 [khugepaged]

root 38 0.0 0.0 0 0 ? S Nov20 0:00 [fsnotify\_mark]

root 39 0.0 0.0 0 0 ? S Nov20 0:00 [ecryptfs-kthrea]

root 40 0.0 0.0 0 0 ? S< Nov20 0:00 [crypto]

root 48 0.0 0.0 0 0 ? S< Nov20 0:00 [kthrotld]

root 50 0.0 0.0 0 0 ? S Nov20 0:00 [scsi\_eh\_0]

root 51 0.0 0.0 0 0 ? S Nov20 0:00 [scsi\_eh\_1]

root 52 0.0 0.0 0 0 ? S Nov20 0:00 [scsi\_eh\_2]

root 53 0.0 0.0 0 0 ? S Nov20 0:00 [scsi\_eh\_3]

root 54 0.0 0.0 0 0 ? S Nov20 0:00 [scsi\_eh\_4]

root 55 0.0 0.0 0 0 ? S Nov20 0:00 [scsi\_eh\_5]

root 58 0.0 0.0 0 0 ? S Nov20 0:00 [kworker/u:5]

root 59 0.0 0.0 0 0 ? S Nov20 0:00 [kworker/u:6]

root 79 0.0 0.0 0 0 ? S< Nov20 0:00 [devfreq\_wq]

root 254 0.0 0.0 0 0 ? S Nov20 0:07 [jbd2/sda1-8]

root 255 0.0 0.0 0 0 ? S< Nov20 0:00 [ext4-dio-unwrit]

root 352 0.0 0.0 2836 604 ? S Nov20 0:00 upstart-udev-bridge --daemon

root 355 0.0 0.0 3520 1708 ? Ss Nov20 0:00 /sbin/udevd --daemon

root 543 0.0 0.0 0 0 ? S< Nov20 0:00 [kpsmoused]

root 559 0.0 0.0 0 0 ? S Nov20 0:00 [irq/47-mei]

root 652 0.0 0.0 0 0 ? S< Nov20 0:00 [rpciod]

root 653 0.0 0.0 0 0 ? S< Nov20 0:00 [nfsiod]

root 681 0.0 0.0 0 0 ? S Nov20 0:09 [flush-8:0]

syslog 708 0.0 0.0 31064 1752 ? Sl Nov20 1:17 rsyslogd -c5

root 713 0.0 0.0 2912 640 ? Ss Nov20 0:00 rpc.idmapd

root 724 0.0 0.0 0 0 ? S< Nov20 0:00 [hd-audio0]

root 735 0.0 0.0 2848 368 ? S Nov20 0:00 upstart-socket-bridge --daemon

root 740 0.0 0.0 0 0 ? S< Nov20 0:00 [hd-audio1]

root 764 0.0 0.0 2700 980 ? Ss Nov20 0:01 rpcbind -w

root 800 0.0 0.0 0 0 ? Z Nov26 0:00 [lightdm] <defunct>

102 917 0.0 0.0 11428 3224 ? Ss Nov20 0:17 dbus-daemon --system --fork --activation=upstart

root 936 0.0 0.0 4744 1612 ? Ss Nov20 0:00 /usr/sbin/bluetoothd

root 946 0.0 0.0 0 0 ? S< Nov20 0:00 [krfcommd]

avahi 961 0.0 0.0 11268 4020 ? S Nov20 1:43 avahi-daemon: running [vermont.local]

avahi 966 0.0 0.0 10188 1072 ? S Nov20 0:00 avahi-daemon: chroot helper

root 1064 0.0 0.0 2928 824 ? Ss Nov20 0:00 dhclient3 -e IF\_METRIC=100 -pf /var/run/dhclient.eth0.pid -lf /var/lib/dhcp/dhclient.eth0.leases -1 eth0

root 1108 0.0 0.0 6684 2312 ? Ss Nov20 0:00 /usr/sbin/sshd -D

root 1408 0.0 0.0 4632 860 tty4 Ss+ Nov20 0:00 /sbin/getty -8 38400 tty4

root 1415 0.0 0.0 4632 864 tty5 Ss+ Nov20 0:00 /sbin/getty -8 38400 tty5

root 1463 0.0 0.0 4632 852 tty2 Ss+ Nov20 0:00 /sbin/getty -8 38400 tty2

root 1464 0.0 0.0 4632 864 tty3 Ss+ Nov20 0:00 /sbin/getty -8 38400 tty3

root 1466 0.0 0.0 4632 856 tty6 Ss+ Nov20 0:00 /sbin/getty -8 38400 tty6

root 1489 0.0 0.0 2176 704 ? Ss Nov20 0:00 acpid -c /etc/acpi/events -s /var/run/acpid.socket

root 1490 0.0 0.0 2620 904 ? Ss Nov20 0:01 cron

daemon 1491 0.0 0.0 2472 348 ? Ss Nov20 0:00 atd

root 1499 0.0 0.0 0 0 ? Z Nov26 0:00 [lightdm] <defunct>

root 1505 0.0 0.0 40588 4572 ? Ssl Nov20 0:00 lightdm

root 1506 0.0 0.0 3604 636 ? Ss Nov20 2:49 /usr/sbin/irqbalance

root 1516 0.0 0.0 34288 3072 ? Ssl Nov20 0:38 /usr/sbin/automount

whoopsie 1526 0.0 0.0 26212 5608 ? Ssl Nov20 0:53 whoopsie

root 1575 0.0 0.0 4580 1452 ? Ss Nov20 0:03 /usr/lib/postfix/master

postfix 1588 0.0 0.0 11532 2624 ? S Nov20 0:00 qmgr -l -t fifo -u

root 1599 0.0 0.0 0 0 ? S< Nov20 0:00 [iprt]

root 1666 0.0 0.0 17916 10912 ? S Nov20 20:10 /usr/bin/python /usr/bin/landscape-client --daemon --pid-file /var/run/landscape/landscape-client.pid

120 1677 0.0 0.1 55204 19496 ? Sl Nov20 13:18 /usr/bin/python /usr/bin/landscape-broker --ignore-sigint --quiet

120 1678 0.0 0.0 23268 15812 ? S Nov20 9:12 /usr/bin/python /usr/bin/landscape-monitor --ignore-sigint --quiet

root 1679 0.0 0.0 18952 14148 ? S Nov20 5:40 /usr/bin/python /usr/bin/landscape-manager --ignore-sigint --quiet

root 1750 0.0 0.0 22680 5092 ? Sl Nov20 0:17 /usr/lib/accountsservice/accounts-daemon

root 1754 0.0 0.0 31944 5216 ? Sl Nov20 0:03 /usr/lib/policykit-1/polkitd --no-debug

ntp 1824 0.0 0.0 12428 3200 ? Ss Nov20 0:52 /usr/sbin/ntpd -p /var/run/ntpd.pid -g -u 115:124

root 1877 0.0 0.0 4632 852 tty1 Ss+ Nov20 0:00 /sbin/getty -8 38400 tty1

root 1892 0.0 0.0 34304 3532 ? Sl Nov20 0:03 /usr/sbin/console-kit-daemon --no-daemon

root 2017 0.0 0.0 28424 3768 ? Sl Nov20 0:01 /usr/lib/upower/upowerd

root 2020 0.0 0.0 0 0 ? S 18:54 0:01 [kworker/2:0]

root 2132 0.0 0.0 11076 3520 ? Ss Dec06 0:00 /usr/sbin/cupsd -F

colord 2137 0.0 0.0 53584 10448 ? Sl Nov20 0:00 /usr/lib/i386-linux-gnu/colord/colord

rtkit 2160 0.0 0.0 21332 1264 ? SNl Nov20 0:08 /usr/lib/rtkit/rtkit-daemon

statd 2266 0.0 0.0 3248 1680 ? Ss Nov20 0:00 rpc.statd --no-notify

root 2267 0.0 0.0 0 0 ? S Nov20 0:00 [lockd]

root 2325 0.0 0.2 58532 41420 tty7 Ss+ 19:02 0:06 /usr/bin/X :0 -auth /var/run/lightdm/root/:0 -nolisten tcp vt7 -novtswitch

root 2329 0.0 0.0 0 0 ? S 19:02 0:00 [kworker/0:0]

root 2332 0.0 0.0 22928 4492 ? Sl 19:02 0:00 lightdm --session-child 236 239

lightdm 2355 0.0 0.0 2236 544 ? Ss 19:02 0:00 /bin/sh /usr/lib/lightdm/lightdm-greeter-session /usr/sbin/unity-greeter

lightdm 2360 0.0 0.0 10624 1708 ? Ss 19:02 0:00 //bin/dbus-daemon --fork --print-pid 5 --print-address 7 --session

lightdm 2361 0.0 0.0 185116 15892 ? Sl 19:02 0:01 /usr/sbin/unity-greeter

lightdm 2367 0.0 0.0 44364 2996 ? Sl 19:02 0:00 /usr/lib/at-spi2-core/at-spi-bus-launcher

lightdm 2374 0.0 0.0 9992 2744 ? S 19:02 0:00 /bin/dbus-daemon --config-file=/etc/at-spi2/accessibility.conf --nofork --print-address 3

lightdm 2379 0.0 0.0 17000 3056 ? Sl 19:02 0:00 /usr/lib/at-spi2-core/at-spi2-registryd --use-gnome-session

lightdm 2381 0.0 0.0 6356 2088 ? S 19:02 0:00 /usr/lib/gvfs/gvfsd

lightdm 2383 0.0 0.0 33736 2556 ? Sl 19:02 0:00 /usr/lib/gvfs//gvfs-fuse-daemon -f /var/lib/lightdm/.gvfs

lightdm 2391 0.0 0.0 33516 2384 ? Sl 19:02 0:00 /usr/lib/dconf/dconf-service

lightdm 2397 0.0 0.0 57784 9072 ? Sl 19:02 0:00 /usr/lib/gnome-settings-daemon/gnome-settings-daemon

root 2406 0.0 0.0 11988 2708 ? S 19:02 0:00 lightdm --session-child 19 239

lightdm 2411 0.0 0.0 76460 4876 ? Sl 19:02 0:00 /usr/lib/indicator-session/indicator-session-service

lightdm 2413 0.0 0.0 71376 5988 ? Sl 19:02 0:00 /usr/lib/indicator-datetime/indicator-datetime-service

lightdm 2424 0.0 0.0 123484 4764 ? Sl 19:02 0:00 /usr/lib/indicator-sound/indicator-sound-service

root 2425 0.0 0.0 0 0 ? Z Nov26 0:00 [lightdm] <defunct>

lightdm 2434 0.0 0.0 7980 2364 ? S 19:02 0:00 /usr/lib/geoclue/geoclue-master

lightdm 2436 0.0 0.0 7220 2728 ? S 19:02 0:00 /usr/lib/i386-linux-gnu/gconf/gconfd-2

lightdm 2440 0.0 0.0 21288 4308 ? S 19:02 0:00 /usr/lib/ubuntu-geoip/ubuntu-geoip-provider

lightdm 2441 0.0 0.0 106440 4932 ? S<l 19:02 0:00 /usr/bin/pulseaudio --start --log-target=syslog

lightdm 2448 0.0 0.0 14104 2492 ? S 19:02 0:00 /usr/lib/pulseaudio/pulse/gconf-helper

root 2501 0.0 0.0 0 0 ? Z Nov26 0:00 [lightdm] <defunct>

root 2502 0.0 0.0 0 0 ? Z Nov26 0:00 [lightdm] <defunct>

gxv7682 3329 0.0 0.0 22736 3656 ? Sl Dec11 0:00 /usr/lib/deja-dup/deja-dup/deja-dup-monitor

postfix 4282 0.0 0.0 11332 2592 ? S 20:11 0:00 pickup -l -t fifo -u -c

root 4334 0.0 0.0 15240 4496 ? Ss Dec11 0:00 sshd: dgl2311 [priv]

root 4385 0.0 0.0 0 0 ? S 20:46 0:00 [kworker/0:1]

root 4387 0.0 0.0 15240 4456 ? Ss 20:47 0:00 sshd: sds1011 [priv]

dgl2311 4488 0.0 0.0 15240 2440 ? S Dec11 0:01 sshd: dgl2311@pts/2

dgl2311 4489 0.0 0.0 13092 5948 pts/2 Ss Dec11 0:00 -bash

sds1011 4541 0.0 0.0 15240 2444 ? S 20:47 0:00 sshd: sds1011@pts/7

sds1011 4542 0.0 0.0 13060 5888 pts/7 Ss 20:47 0:00 -bash

dgl2311 4587 0.0 0.0 92140 4612 pts/2 S+ Dec11 0:00 /usr/lib/gcl-2.6.7/unixport/saved\_gcl -dir /usr/lib/gcl-2.6.7/unixport/ -libdir /usr/lib/gcl-2.6.7/ -eval (setq si::\*allow-gzipped-file\* t) -eval (setq si::\*tk-library\* "/usr/lib/tk8.4")

root 4606 0.0 0.0 15240 4452 ? Ss 20:47 0:00 sshd: sds1011 [priv]

sds1011 4734 0.0 0.0 15240 2448 ? S 20:47 0:00 sshd: sds1011@pts/8

sds1011 4735 0.0 0.0 13060 5888 pts/8 Ss+ 20:47 0:00 -bash

sds1011 4802 0.0 0.0 17224 5172 pts/7 S+ 20:48 0:00 vim linkedlist.c

root 4815 0.0 0.0 0 0 ? S 20:50 0:00 [flush-0:26]

root 4827 0.0 0.0 0 0 ? S 20:51 0:00 [kworker/0:2]

jdh7273 4849 0.0 0.0 17332 5024 pts/6 S+ 20:55 0:00 vim ssh.c

root 4863 0.0 0.0 0 0 ? S 20:55 0:00 [flush-0:29]

root 5154 0.0 0.0 15212 4324 ? Ss 20:58 0:00 sshd: axm3244 [priv]

axm3244 5282 0.0 0.0 15360 2388 ? S 20:58 0:00 sshd: axm3244@notty

axm3244 5283 0.0 0.0 9728 2560 ? Rs 20:58 0:00 ps aux

root 5635 0.0 0.0 0 0 ? S Dec11 0:08 [kworker/3:2]

root 13297 0.0 0.0 0 0 ? Z Nov27 0:00 [lightdm] <defunct>

root 14374 0.0 0.0 0 0 ? Z Nov27 0:00 [lightdm] <defunct>

root 14608 0.0 0.0 15240 4504 ? Ss Nov27 0:00 sshd: nxz3937 [priv]

nxz3937 14765 0.0 0.0 15736 2712 ? S Nov27 3:49 sshd: nxz3937@pts/0

nxz3937 14766 0.0 0.0 13160 6068 pts/0 Ss Nov27 0:00 -bash

root 18316 0.0 0.0 0 0 ? S< Nov30 0:00 [xfs\_mru\_cache]

root 18317 0.0 0.0 3516 1280 ? S Nov30 0:00 /sbin/udevd --daemon

root 18318 0.0 0.0 0 0 ? S< Nov30 0:00 [xfslogd]

root 18319 0.0 0.0 0 0 ? S< Nov30 0:00 [xfsdatad]

root 18320 0.0 0.0 0 0 ? S< Nov30 0:00 [xfsconvertd]

root 18321 0.0 0.0 3516 1260 ? S Nov30 0:00 /sbin/udevd --daemon

root 18324 0.0 0.0 0 0 ? S Nov30 0:00 [jfsIO]

root 18325 0.0 0.0 0 0 ? S Nov30 0:00 [jfsCommit]

root 18326 0.0 0.0 0 0 ? S Nov30 0:00 [jfsCommit]

root 18327 0.0 0.0 0 0 ? S Nov30 0:00 [jfsCommit]

root 18328 0.0 0.0 0 0 ? S Nov30 0:00 [jfsCommit]

root 18329 0.0 0.0 0 0 ? S Nov30 0:00 [jfsSync]

root 22015 0.0 0.0 0 0 ? Z Nov28 0:00 [lightdm] <defunct>

nxz3937 23266 0.0 0.0 2408 704 pts/0 S+ Dec05 0:00 script

nxz3937 23267 0.0 0.0 3432 1392 pts/0 S+ Dec05 2:34 script

nxz3937 23268 0.0 0.0 10548 3412 pts/1 Ss+ Dec05 0:00 bash -i

root 23698 0.0 0.0 0 0 ? Z Nov28 0:00 [lightdm] <defunct>

root 29582 0.0 0.0 0 0 ? S 11:55 0:04 [kworker/2:3]

root 29756 0.0 0.0 25272 3656 ? Sl Nov26 0:19 /usr/lib/udisks/udisks-daemon

root 29757 0.0 0.0 6556 728 ? S Nov26 0:00 udisks-daemon: not polling any devices

root 31142 0.0 0.0 15240 4468 ? Ss 16:11 0:00 sshd: jdh7273 [priv]

jdh7273 31271 0.0 0.0 15392 2560 ? S 16:11 0:00 sshd: jdh7273@pts/3

jdh7273 31272 0.0 0.0 13160 6068 pts/3 Ss+ 16:11 0:00 -bash

jcm2734 31962 99.6 0.0 3372 872 ? R Dec06 10450:52 /home/stu12/s9/jcm2734/lab2/lab2-sol

jcm2734 31965 99.6 0.0 3372 872 ? R Dec06 10451:06 /home/stu12/s9/jcm2734/lab2/lab2-sol

jcm2734 31969 99.6 0.0 3372 872 ? R Dec06 10450:44 /home/stu12/s9/jcm2734/lab2/lab2-sol

jcm2734 31980 99.6 0.0 3372 868 ? R Dec06 10450:39 /home/stu12/s9/jcm2734/lab2/lab2-sol

root 32261 0.0 0.0 0 0 ? S 16:59 0:02 [kworker/1:2]

root 32419 0.0 0.0 0 0 ? S 17:03 0:03 [kworker/3:1]

root 32496 0.0 0.0 0 0 ? S 17:15 0:00 [kworker/1:0]

root 32582 0.0 0.0 15240 4468 ? Ss 17:27 0:00 sshd: jdh7273 [priv]

jdh7273 32739 0.0 0.0 15240 2432 ? S 17:27 0:00 sshd: jdh7273@pts/6

jdh7273 32740 0.0 0.0 13156 6064 pts/6 Ss 17:27 0:00 -bash

-------------------------------------------------------------------------------

Test Case 4:

$ ./remoteCMD glados "ant"

Buildfile: build.xml does not exist!

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END OF FILE