

## Basic Commands

**run** [*core*] debug *program* [using coredump *core*]  
**stop** [*function*] set breakpoint at *function* [in *file*]  
**start** [*list*] start your program [with *arglist*]  
**bt** backtrace: display program stack  
**print** [*expr*] display the value of an expression  
**continue** continue running your program  
**next** [*line*] next line, stepping over function calls  
**step** [*line*] next line, stepping into function calls

## Starting GDB

**run** start GDB, with no debugging files  
**run** [*program*] begin debugging *program*  
**run** [*program*] [*core*] debug coredump *core* produced by *program*  
**help** describe command line options

## Exiting GDB

**quit** exit GDB; also **q** or EOF (eg **C-d**)  
**!kill** (eg **C-c**) terminate current command, or send to running process

## Getting Help

**help** list classes of commands  
**help** [*class*] one-line descriptions for commands in *class*  
**help** [*command*] describe *command*

## Starting your Program

**run** [*list*] start your program with *arglist*  
**run** [*list*] start your program with current argument *list*  
**run** [*<inf>*] [*>outf*] start your program with input, output redirected  
**kill** kill running program  
**run** [*dev*] use *dev* as stdin and stdout for next **run**  
**run** [*arglist*] specify *arglist* for next **run**  
**run** [*list*] specify empty argument list  
**run** [*list*] display argument list  
**set** [*var*] show all environment variables  
**set** [*var*] [*string*] show value of environment variable *var*  
**set** [*var*] [*string*] set environment variable *var*  
**unset** [*var*] remove *var* from environment

## Shell Commands

**cd** [*dir*] change working directory to *dir*  
**pwd** Print working directory  
**make** call “make”  
**!string** execute arbitrary shell command string

... show one or more arguments

## Breakpoints and Watchpoints

**break** [*file:*] [*line*] set breakpoint at *line* number [in *file*]  
**b** [*file:*] [*line*] eg: **break main.c:37**  
**break** [*file:*] [*func*] set breakpoint at *func* [in *file*]  
**break** [*offset*] set break at *offset* lines from current stop  
**break** [*-offset*] set breakpoint at address *addr*  
**break** [*\*addr*] set breakpoint at next instruction  
**break** [*... if expr*] break conditionally on nonzero *expr*  
**cond** [*n*] [*expr*] new conditional expression on breakpoint *n*; make unconditional if no *expr*  
**tbreak** [*...*] temporary break; disable when reached  
**rbreak** [*regex*] break on all functions matching *regex*  
**watch** [*expr*] set a watchpoint for expression *expr*  
**catch** [*event*] break at *event*, which may be **catch**, **throw**, **exec**, **fork**, **vfork**, **load**, or **unload**.  
**info break** show defined breakpoints  
**info watch** show defined watchpoints

**clear** delete breakpoints at next instruction  
**clear** [*file:*] [*fun*] delete breakpoints at entry to *fun()*  
**clear** [*file:*] [*line*] delete breakpoints on source line  
**delete** [*n*] delete breakpoints [or breakpoint *n*]

**disable** [*n*] disable breakpoints [or breakpoint *n*]  
**enable** [*n*] enable breakpoints [or breakpoint *n*]  
**enable once** [*n*] enable breakpoints [or breakpoint *n*]; disable again when reached  
**enable del** [*n*] enable breakpoints [or breakpoint *n*]; delete when reached  
**ignore** [*n*] [*count*] ignore breakpoint *n*, *count* times

**commands** [*n*] execute GDB *command-list* every time breakpoint *n* is reached. [**silent** suppresses default display]  
**end** end of *command-list*

## Program Stack

**backtrace** [*n*] print trace of all frames in stack; or of *n* frames—innermost if *n*>0, outermost if *n*<0  
**bt** [*n*]  
**frame** [*n*] select frame number *n* or frame at address *n*; if no *n*, display current frame  
**up** [*n*] select frame *n* frames up  
**down** [*n*] select frame *n* frames down  
**info frame** [*addr*] describe selected frame, or frame at *addr*  
**info args** arguments of selected frame  
**info locals** local variables of selected frame  
**info reg** [*rn*]... register values [for regs *rn*] in selected frame; **all-reg** includes floating point

## Execution Control

**continue** [*count*] continue running; if *count* specified, ignore this breakpoint next *count* times  
**c** [*count*]  
**step** [*count*] execute until another line reached; repeat *count* times if specified  
**s** [*count*]  
**stepi** [*count*] step by machine instructions rather than source lines  
**si** [*count*]  
**next** [*count*] execute next line, including any function calls  
**n** [*count*]  
**nexti** [*count*] next machine instruction rather than source line  
**ni** [*count*]  
**until** [*location*] run until next instruction (or *location*)  
**finish** run until selected stack frame returns  
**return** [*expr*] pop selected stack frame without executing [setting return value]  
**signal** [*num*] resume execution with signal *s* (none if 0)  
**jump** [*line*] resume execution at specified *line* number or *address*  
**jump** [*\*address*]  
**set var=expr** evaluate *expr* without displaying it; use for altering program variables

## Display

**print** [*/f*] [*expr*] show value of *expr* [or last value \$] according to format *f*:  
**p** [*/f*] [*expr*]  
**x** hexadecimal  
**d** signed decimal  
**u** unsigned decimal  
**o** octal  
**t** binary  
**a** address, absolute and relative  
**c** character  
**f** floating point  
**call** [*/f*] [*expr*] like **print** but does not display **void**  
**x** [*/Nuf*] [*expr*] examine memory at address *expr*; optional format spec follows slash  
**N** count of how many units to display  
**u** unit size; one of  
**b** individual bytes  
**h** halfwords (two bytes)  
**w** words (four bytes)  
**g** giant words (eight bytes)  
**f** printing format. Any **print** format, or  
**s** null-terminated string  
**i** machine instructions  
**disassem** [*addr*] display memory as machine instructions

## Automatic Display

**display** [*/f*] [*expr*] show value of *expr* each time program stops [according to format *f*]  
**display** display all enabled expressions on list  
**undisplay** [*n*] remove number(s) *n* from list of automatically displayed expressions  
**disable disp** [*n*] disable display for expression(s) number *n*  
**enable disp** [*n*] enable display for expression(s) number *n*  
**info display** numbered list of display expressions

## Sessions

an expression in C, C++, or Modula-2 (including function calls), or:  
an array of *len* elements beginning at *addr*  
a variable or function *nm* defined in *file*  
read memory at *addr* as specified *type*  
most recent displayed value  
*n*th displayed value  
displayed value previous to \$  
*n*th displayed value back from \$  
last address examined with *x*  
value at address \$\_  
convenience variable; assign any value

## Values [n]

show last 10 values [or surrounding \$n]  
display all convenience variables

## Symbol Table

*address s* show where symbol *s* is stored  
*as [regex]* show names, types of defined functions (all, or matching *regex*)  
*f [regex]* show names, types of global variables (all, or matching *regex*)  
*expr [or \$]* show data type of *expr* [or \$] without evaluating; *ptype* gives more detail  
*pe* describe type, struct, union, or enum

## Scripts

*script* read, execute GDB commands from file *script*  
*cmd* create new GDB command *cmd*; execute script defined by *command-list*  
*command-list* end of *command-list*  
*cmd* create online documentation for new GDB command *cmd*  
*help-text* end of *help-text*

## Signals

*signal act* specify GDB actions for *signal*:  
announce signal  
be silent for signal  
halt execution on signal  
do not halt execution  
allow your program to handle signal  
do not allow your program to see signal  
*signals* show table of signals, GDB action for each

## Connecting Targets

*type param* connect to target machine, process, or file  
*target* display available targets  
*param* connect to another process  
release target from GDB control

## Controlling GDB

*set param value* set one of GDB's internal parameters  
*show param* display current setting of parameter

Parameters understood by *set* and *show*:

*complaint limit* number of messages on unusual symbols  
*confirm on/off* enable or disable cautionary queries  
*editing on/off* control *readline* command-line editing  
*height lpp* number of lines before pause in display  
*language lang* Language for GDB expressions (*auto*, *c* or *modula-2*)  
*listsize n* number of lines shown by *list*  
*prompt str* use *str* as GDB prompt  
*radix base* octal, decimal, or hex number representation  
*verbose on/off* control messages when loading symbols  
*width cpl* number of characters before line folded  
*write on/off* Allow or forbid patching binary, core files (when reopened with *exec* or *core*)  
*history ...* groups with the following options:  
*h ...*  
*h exp off/on* disable/enable *readline* history expansion  
*h file filename* file for recording GDB command history  
*h size size* number of commands kept in history list  
*h save off/on* control use of external file for command history  
*print ...* groups with the following options:  
*p ...*  
*p address on/off* print memory addresses in stacks, values  
*p array off/on* compact or attractive format for arrays  
*p demangl on/off* source (demangled) or internal form for C++ symbols  
*p asm-dem on/off* demangle C++ symbols in machine-instruction output  
*p elements limit* number of array elements to display  
*p object on/off* print C++ derived types for objects  
*p pretty off/on* struct display: compact or indented  
*p union on/off* display of union members  
*p vtbl off/on* display of C++ virtual function tables  
*show commands* show last 10 commands  
*show commands n* show 10 commands around number *n*  
*show commands +* show next 10 commands

## Working Files

*file [file]* use *file* for both symbols and executable; with no arg, discard both  
*core [file]* read *file* as coredump; or discard  
*exec [file]* use *file* as executable only; or discard  
*symbol [file]* use symbol table from *file*; or discard  
*load file* dynamically link *file* and add its symbols  
*add-sym file addr* read additional symbols from *file*, dynamically loaded at *addr*  
*info files* display working files and targets in use  
*path dirs* add *dirs* to front of path searched for executable and symbol files  
*show path* display executable and symbol file path  
*info share* list names of shared libraries currently loaded

## Source Files

*dir names* add directory *names* to front of source path  
*dir* clear source path  
*show dir* show current source path  
*list* show next ten lines of source  
*list -* show previous ten lines  
*list lines* display source surrounding *lines*, specified as:  
[*file:*]*num* line number [in named file]  
[*file:*]*function* beginning of function [in named file]  
*+off* *off* lines after last printed  
*-off* *off* lines previous to last printed  
*\*address* line containing *address*  
*list f,l* from line *f* to line *l*  
*info line num* show starting, ending addresses of compiled code for source line *num*  
*info source* show name of current source file  
*info sources* list all source files in use  
*forw regex* search following source lines for *regex*  
*rev regex* search preceding source lines for *regex*

## GDB under GNU Emacs

*M-x gdb* run GDB under Emacs  
*C-h m* describe GDB mode  
*M-s* step one line (*step*)  
*M-n* next line (*next*)  
*M-i* step one instruction (*stepi*)  
*C-c C-f* finish current stack frame (*finish*)  
*M-c* continue (*cont*)  
*M-u* up *arg* frames (*up*)  
*M-d* down *arg* frames (*down*)  
*C-x &* copy number from point, insert at end  
*C-x SPC* (in source file) set break at point

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