

Metacharacters are symbols with special meanings for Bash and other shells. They aren't interpreted literally by the shell, but change the way the shell processes input and output.

Metacharacters and control operators

| | | |
|-------|--------------------|---|
| ~ | Tilde | Home directory |
| \$ | Dollar sign | Denote a variable (as in \$HOME or \$USER) |
| & | Ampersand | Run a command in the background |
| ; | Semi-colon | Command termination |
| && | Double ampersand | Continue to the next command upon success (AND) |
| | Double pipe | Continue to the next command upon failure (OR) |
| | Pipe | Use output of the first command as input for the next |
| ' | Single-quote | Treat all contents as literal |
| " | Quote | Treat spaces as literal, but expand variables |
| \ | Backslash | Treat the next character as literal |
| () | Parentheses | Execute contents in a subshell |
| { ; } | Braces | Execute in current shell (terminate with semi-colon) |
| [] | Brackets | Test expression |
| (()) | Double parentheses | Evaluate contents as a mathematical expression |
| [[]] | Double brackets | Test expression, returning 0 or 1 |

Redirection

| | | |
|----|----------------------------|----|
| > | Overwrite existing content | < |
| >> | Append to existing content | << |

Wildcards

- ? Match exactly one of any character
- * Match zero or more of any character

Ranges

- [0-9] Any digit
- [a-z] Any lowercase alpha
- [A-Z] Any uppercase alpha
- [a-zA-Z] Any lowercase or uppercase alpha
- [abc] Only **a**, **b**, and **c**
- [!a-z] No lowercase alpha
- [!1-3] No **1**, **2**, or **3**, but all other digits
- [b-hot] Lowercase **b** through **h**, and the letter **o** and the letter **t**
- [A-M0-9] Uppercase alpha **A** through **M**, and any digit

Escape sequences

Escape sequences are interpreted as commands by the shell.

| | | |
|---------------------|---|------------------------------|
| <code>\b</code> | Backspace | <code>echo a\$\b'b</code> |
| <code>\e</code> | Escape | <code>echo a\$\e'b</code> |
| <code>\f</code> | Form feed (like a non-returning newline) | <code>echo a\$\f' b</code> |
| <code>\n</code> | Newline | <code>echo a\$\n' b</code> |
| <code>\r</code> | Carriage return | <code>echo a\$\r' b</code> |
| <code>\t</code> | Horizontal tab | <code>echo a\$\t'b</code> |
| <code>\v</code> | Vertical tab | <code>echo a\$\v'b</code> |
| <code>\\</code> | Backslash | <code>echo a\$\\'b</code> |
| <code>\cx</code> | Control-X | <code>echo a\$\cH'b</code> |
| <code>\uHHHH</code> | Unicode character of hexadecimal value HHHH | <code>echo a\$\u0259'</code> |
| <code>\NNN</code> | 8-bit character with octal value NNN | <code>echo a\$\451'</code> |