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Input-Output (IO) Redirections

Three IO “channels” are available by default:

**Standard input (STDIN, Number: 0)**: The input for your program, normally your keyboard but can be an other program (when using pipes or IO redirection)

**Standard output (STDOUT, Number: 1)**: Where your program writes its regular output to. Normally your terminal

**Standard error (STDERR, Number: 2)**: Where your programs normally write their error message to. Normally your terminal

Input, output and error messages can be redirected from their default “targets” to others. If using the file descriptor numbers (0, 1, 2) in redirections, then there must be no whitespace between the numbers and the redirection operators.

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|  | Redirect to /dev/null to discard the output |

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| *cmd* **>** *afile* | Write the output of cmd into afile. This will ***overwrite*** afile. |
| *cmd* **>>** *afile* | Write the output of cmd into afile. This will ***append*** to afile |
| *cmd* **>** /dev/null | Discard the output of cmd |
| *cmd* **>** *afile* **2>&1** | Write the output of cmd into afile (overwriting the file!) and write STDERR to the same place |
| *cmd* **>>** *afile* **2>&1** | Append the output and error messages of cmd to afile |
| *cmd* **>** *afile* **2>** *afile* | Same as above |
| *cmd* **>>** *afile* **2>**/dev/null | Append the output of cmd to afile and discard error messages |
| *cmd* **>** /dev/null **2>&1**  *cmd* **>** /dev/null **2>**/dev/null  *cmd* **>&** /dev/null | Three times the same: Discard output and error messages completely |
| *cmd1* **<** *cmd2* | Use output of cmd2 as standard input for cmd1 |

See also http://www.catonmat.net/blog/bash-one-liners-explained-part-three/, http://www.catonmat.net/blog/bash-redirections-cheat-sheet/ and http://wiki.bash-hackers.org/howto/redirection\_tutorial.