

## Minishell Bonus Features Checklist

This checklist helps track implementation of bonus features for the Minishell project, such as command grouping, logic operators, and proper file descriptor behavior across pipelines.

- ☐ Support for command grouping with parentheses: ( )
  - ☐ Parse nested token structures within parentheses
  - ☐ Recursively build AST from grouped sublists
  - ☐ Execute grouped commands in isolated subshell
- ☐ Handle logical AND (&&) and OR (||) operators
  - ☐ Respect short-circuit logic during execution
  - ☐ Ensure correct operator precedence
- ☐ Ensure multiple redirections per command are handled properly
  - ☐ Handle cases like: `cmd < infile1 < infile2 > out`
- ☐ Ensure correct file descriptor closing between commands
  - ☐ Prevent file descriptor leaks in pipelines and subshells
- ☐ Support chained commands using pipes combined with logic
  - ☐ e.g., `cmd1 | cmd2 && cmd3 || cmd4`
- ☐ Implement return value handling across pipelines and logic blocks
- ☐ Handle nested groupings and multiple operator types
  - ☐ e.g., `(cmd1 && cmd2) || (cmd3 | cmd4)`
- ☐ Test bonus features with complex edge cases and mixed syntax

*Use this checklist to plan and validate bonus feature implementations.*