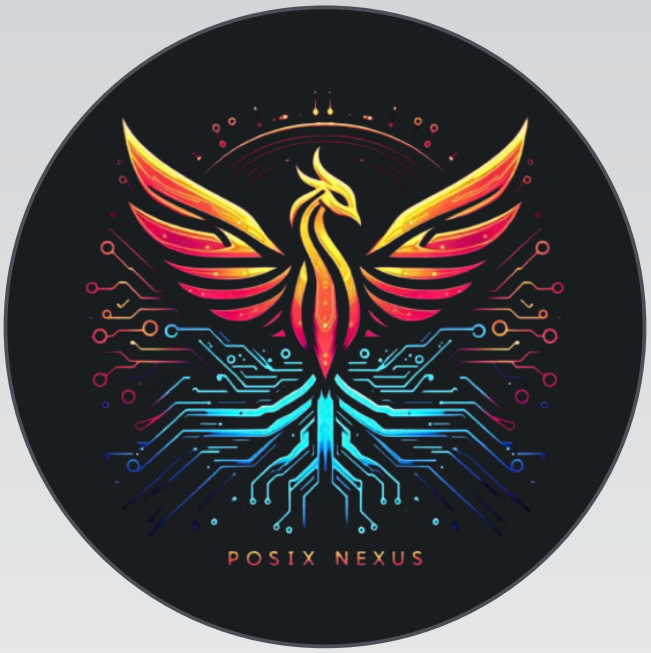
Posix-Nexus Shell



Canine-Table

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I Git

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] The following functions enhance Git workflows by automating common social interactions and streamlining GitHub API integrations.

gh_social(): Automates GitHub social interactions. This function ensures proper authentication, manages "following" and "follower" relationships, and includes cleanup logic to remove unnecessary associations based on specified criteria.

II Python

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] The following functions provide robust tools for managing Python virtual environments, focusing on seamless integration, modularity, and ease of use.

set_py_venv(): Manages the Python virtual environment. This function supports activating (`-a`), deactivating (`-d`), creating (`-c`), and utilizing (`-s`, `-r`) a Python virtual environment for a specified application.

III Str

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The following functions enable dynamic string manipulation, including random string generation, targeted searches and replacements, and case adjustments for versatile text handling.

- **get_str_rand()**: Generates a random string of specified length **num**, using character sets **chars** such as alphanumeric or others.
- **get_str_locate()**: Searches for occurrences of a string **fnd** within the input, optionally replacing it with **rpl**, separating content with **sep**, and supporting global or targeted searches.
- **set_str_case()**: Modifies the case of a string, converting it to uppercase, lowercase, or title case, based on the provided option (`u`, `l`, or `t`).
- **set_str_format()**: Formats a string based on a specified format **fmt**, with optional separators **sep**, and alignment options like **lft**, **rgt**, or **kp**.
- **add_str_append()**: Appends a specified character **char** or string multiple times to reach a desired length **num**, optionally extending or modifying the input based on **ed**.
- **add_str_div()**: Creates a horizontal divider string of the length derived from terminal column size, using repeated characters like `"-"`.
- **get_str_parser()**: Parses an input string **D2** based on the format definition **D1**, extracting flags, key-value pairs, and unrecognized elements.
- **get_str_print()**: Formats arguments **D** for compatibility with AWK-based processing, wrapping non-options with quotes and preserving options as-is.

IV Algorithms

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] The following functions utilize efficient algorithms for sorting and processing data structures, with a focus on modularity and adaptability.

- **set_algor_qsort()**: Implements a QuickSort algorithm to sort a list (**lst**) of elements, with options to reverse the sort order (**rvs**), apply a custom sorting mechanism (**meh**), and use specified delimiters (**sep** and **osep**).

V Int

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The following functions provide powerful computational tools for performing advanced numerical operations, including base-specific arithmetic, distribution, range adjustment, and mathematical constants handling.

- **get_int_conv()**: Converts a number **num** from its original base **from** to another base **to**, supporting optional signed number handling.
- **get_int_bsubt()**: Computes the difference of two numbers, **minuend** and **subtrahend**, in base **from** with a specified precision **prec**, supporting signed numbers.
- **get_int_badd()**: Computes the sum of two numbers, **addend1** and **addend2**, in base **from** with a specified precision **prec**, supporting signed numbers.
- **get_int_comp()**: Computes the complement of a number **num** in the specified **base**, leveraging AWK utility functions for base-specific computations.
- **get_int_abs()**: Calculates the absolute value of **num**, ensuring the result is always a positive number, using AWK's utility functions.
- **get_int_fact()**: Computes the factorial of **num**, with an option to print intermediate steps if **prnt** is set to true.
- **get_int_fib()**: Computes the **num**-th Fibonacci number, optionally printing intermediate sums if **prnt** is set to true.
- **get_int_round()**: Rounds **num** according to the specified method **rnd** (e.g., `ceiling` or `round`), defaulting to truncation if no method is provided.
- **get_int_gcd()**: Computes the greatest common divisor (GCD) of two numbers, **num1** and **num2**, using the Euclidean algorithm.
- **get_int_remainder()**: Computes the remainder of dividing **num1** by **num2**, ensuring both inputs are valid digits.
- **get_int_lcd()**: Calculates the least common denominator (LCD) of **num1** and **num2** using AWK's mathematical utilities.
- **get_int_tau()**: Returns the value of τ (the circle constant, $\tau = 2\pi$), optionally based on the input **num** for calculations or prints a default τ if no input is provided.
- **get_int_pi()**: Returns the value of π (pi constant), optionally using the input **num** for calculations or defaults to a general π value when no input is specified.

V Int

- **get_int_distribute()**: Distributes **num1** evenly across the range defined by **num2** and **num3**, ensuring all inputs are valid digits.
- **get_int_range()**: Adjusts **num1** to fit within the range defined by **num2** and **num3**, using modulus operations for precise computation.

VI Struct

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The following functions provide a robust set of tools for managing structured data in shell scripts, covering retrieval, comparison, manipulation, and execution, with a focus on modularity and efficiency.

- **get_struct_ref()**: Retrieves the value of a variable by its name, allowing for dynamic access and reference in shell scripts.
- **get_struct_ref_append()**: Appends a value to the referenced variable, optionally inserting a separator before the new content, and returns the updated structure.
- **get_struct_compare()**: Compares two structures (input list and reference list), with options for case sensitivity, delimiters, and comparison modes (e.g., left, right, or intersection).
- **get_struct_list()**: Processes an input list with options for reversing, deduplication, or restructuring, while using specified separators for splitting and joining elements.
- **new_struct_task()**: Executes tasks iteratively on elements from a structured list, with configurable input, output, and error streams, as well as background execution control.
- **set_struct_noexpand()**: Prepares a variable for structured assignment by escaping special characters, ensuring its value is preserved in a non-expanded format.
- **set_struct_opt()**: Processes input and reference lists (**inpt** and **reflst**) using specified delimiters and options, matching input against reference values with configurable verbosity, case sensitivity, and length validation.

^ VI Struct

- **get_int_range()**: Adjusts **num1** to fit within the range defined by **num2** and **num3**, using modulus operations for precise computation.

VII Content

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] The following functions streamline content operations, allowing for efficient path resolution, listing of files or directories, and modular scripting through dynamic file loading.

- **get_content_trim()**: Normalizes file or directory paths by removing redundant slashes, resolving relative paths (`.` `/`), and trimming trailing slashes.
- **get_content_leaf()**: Extracts the last component (leaf) of a file or directory path, such as the filename or the final directory in a hierarchy. Ensures accurate results by resolving the container path first.
- **get_content_container()**: Resolves the parent directory (container) of a given file or directory. Validates the path and returns the absolute directory path after normalization.
- **get_content_path()**: Resolves the full absolute path for a given file or directory, normalizing the input and accounting for symbolic links or relative paths.
- **get_content_list()**: Lists details of files or directories specified in the input. Differentiates between containers (directories) and leaf elements (files) for accurate display.
- **add_content_modules()**: Dynamically loads modular shell scripts from a specified source directory, excluding the **content-mod.sh** file itself. Ensures readability and prevents redundant loading.

VIII Dialog

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] The following functions enable dynamic, customizable dialog interactions for time management, user confirmations, and various structured inputs.

- **__get_dialog_factory()**: Constructs dialog window definitions dynamically, based on specified options (`-v`, `-m`, `-b`, `-p`, `-e`). Supports multiple dialog types, argument parsing, and output formatting.
- **__get_dialog_size()**: Retrieves the current terminal dimensions, including the number of rows and columns, for adaptive dialog layouts.
- **get_dialog_explorer()**: Opens an interactive dialog window for file or directory exploration. Supports multiple dialog types (`fselect`, `dselect`, `textbox`, `editbox`, `tailboxbg`, `tailbox`) based on the provided input and conditions.
- **get_dialog_yn()**: Displays a yes/no or message box dialog. Dynamically determines the type (`yesno` or `msgbox`) based on the provided options and user interaction requirements.
- **get_dialog_cal()**: Launches a calendar dialog for date selection. Automatically formats the output to display the current date or allows custom configurations.
- **get_dialog_time()**: Launches a dialog window to manage time-based interactions. Supports **pause** for countdowns and **timebox** for specific time selection, with configurable defaults and user-defined inputs.

IX Cmd

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The following functions offer essential utilities for discovering and verifying the availability of commands, enhancing the portability and adaptability of shell scripts across different environments.

- **get_cmd()**: Iterates through a list of commands provided as arguments, checks their availability using `command -v`, and returns the first found command or exits if none are found.
- **get_cmd_pager()**: Searches for commonly used pager commands (`less`, `more`, and `tee`) by leveraging the **get_cmd()** function.
- **get_cmd_awk()**: Searches for AWK implementations (`mawk`, `nawk`, `awk`, `gawk`) using the **get_cmd()** function.
- **get_cmd_shell()**: Searches for available shell interpreters (`dash`, `sh`, `bash`, `zsh`, `fish`, and others) in the current environment.
- **get_cmd_editor()**: Locates command-line text editors (`nvim`, `vim`, `gvim`, `vi`) for editing files.
- **get_cmd_tex_compiler()**: Searches for LaTeX compilation utilities (`latexmk`, `pdflatex`, `lualatex`, `xelatex`).
- **get_cmd_pdf_viewer()**: Finds installed PDF viewers (`zathura`, `mupdf`, `evince`).
- **get_cmd_pkgmgr()**: Searches for package management tools (`pacman`, `apt`, `dnf`, `brew`, and others) in the system.

X Tty

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The following functions provide utilities for managing and querying TTY properties, including property retrieval, structured formatting, and signal handling for enhanced user interaction.

- **get_tty_prop_list()**: Lists all TTY properties in key-value pairs, processing the output of `stty -a` for structured formatting.
- **get_tty_prop()**: Retrieves specific TTY properties based on provided keys (`-k`) or values (`-v`), enabling focused property queries.
- **set_tty_hault()**: Temporarily disables the cursor using `setterm` and traps signals to re-enable it upon script exit or interruption.

XI Pkgmgr

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] The following functions serve as wrappers for various package managers, offering a unified interface for common operations like updating, searching, installing, and managing software packages across different environments.

- **get_pkgmgr()**: A wrapper function for interacting with the defined package manager, supporting operations like updating (`-u`), querying (`-q`), searching (`-s`), installing (`-i`), removing (`-r`), and cleaning caches (`-c`).
- **__set_pkgmgr()**: Manages the execution of package manager commands by mapping user-specified options to the corresponding commands for the chosen package manager.
- **__get_pkgmgr_*()**: Defines package manager-specific command mappings for each supported package manager, such as `pacman`, `apt`, `apk`, `brew`, and others.