

Project Title: Custom Executable Locator (custom_which.sh)

Author: Sanjeet Prasad

Email: sanjeet8.23@gmail.com

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Environment: Ubuntu 22.04 (VirtualBox), GNU Bash

Objective

Develop a shell script that mimics the behaviour of the Unix which command. The script should determine which executable file would be invoked if a given command were typed in the shell. It must support both single and multiple command inputs, and optionally list all matching executables using a -a flag.

Prohibited Commands

To ensure a custom implementation, the following commands **must not be used**:

- which
- type (bash or ksh)
- whence
- locate
- ls
- Any use of **temporary files**

Functional Requirements

Feature	Description
Command Resolution	Accepts one or more command names as arguments and resolves them to executable paths.
PATH Search	Searches the PATH environment variable for matching executables.
Slash Detection	If a command contains /, treat it as a pathname and check directly.
Executable Validation	A file is considered valid only if it is a regular file , readable , and executable .
Directory Exclusion	Directories must not be treated as valid commands, even if executable.
Empty PATH Entries	Empty entries in PATH should be interpreted as the current directory (.).
Multiple Matches (-a)	If -a is provided, list all matching executables in PATH. Otherwise, return only the first match.

Feature	Description
Multiple Commands	Supports multiple command names in a single invocation. Each is resolved independently.
Output Format	For each command:

- If found: print full path
- If not found: print NOT FOUND |

Validation Criteria

Test Case	Expected Behaviour
./custom_which.sh vi	Returns full path to vi if found in PATH.
./custom_which.sh -a tar	Lists all occurrences of tar in PATH.
./custom_which.sh ./myscript.sh	Checks if myscript.sh is readable and executable.
./custom_which.sh /usr/bin/ls	Validates absolute path directly.
./custom_which.sh ./mydir	Returns NOT FOUND (directories are excluded).
./custom_which.sh unknowncmd	Returns NOT FOUND.
./custom_which.sh tar ls	Resolves both tar and ls independently.

Input Format

./custom_which.sh [-a] command1 [command2 ...]

- -a (optional): Show **all** matches for each command.
- command1, command2, ...: One or more command names or pathnames.

Output Format

For each command:

- If found:
/usr/bin/command
- If not found:
NOT FOUND

Example Usage

./custom_which.sh bash

Output: /usr/bin/bash

```
./custom_which.sh -a tar
```

```
# Output:
```

```
# /bin/tar
```

```
# /usr/bin/tar
```

```
./custom_which.sh ./myscript.sh
```

```
# Output: ./myscript.sh (if readable and executable)
```

```
./custom_which.sh ./mydir
```

```
# Output: NOT FOUND
```

Notes

- The script must be written in **pure Bash**.
- It must not rely on external utilities for file detection.
- It should be portable across standard Unix-like environments.