LESSON 9

script.sh

```
#!/bin/bash
set -euo pipefail
trap cleanup EXIT
```



set -euo pipefail

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BASH & ZSH SCRIPTING

LESSON 9

Error Handling and Debugging

set -euo pipefail, trap, bash -x and ShellCheck

Strict Mode

strict.sh

```
#!/bin/bash
set -euo pipefail

rm -rf "$BUILD_DIR/"*      # without -u, an empty variable could mean rm -rf /*
grep ERROR app.log | wc -l   # pipefail catches a missing app.log
```

- By default Bash keeps going after an error, which can be dangerous. set dash e stops on the …
- set dash u stops on an unset variable, and set dash o pipefail makes a pipeline fail if any …

01

Cleaning Up with trap

trap.sh

```
tmp=$(mktemp)
cleanup() { rm -f "$tmp"; echo "cleaned up"; }
trap cleanup EXIT
trap 'echo "error on line $LINENO" >&2' ERR

curl -s https://example.com > "$tmp"
wc -l < "$tmp"
```

- trap runs a command when the script exits or receives a signal. trap cleanup EXIT runs your …
- Use it to delete temporary files, release lock files, or print where an error happened.

02

Good Error Messages

die.sh

```
die() { echo "ERROR: $*" >&2; exit 1; }

[[ $# -eq 1 ]]   || die "usage: $0 FILE"
[[ -r "$1" ]]    || die "cannot read $1"
command -v jq >/dev/null || die "please install jq"
```

- Send errors to standard error with greater-than ampersand two, and exit with a non-zero …
- A small die function keeps this consistent across your script.

03

Debugging with bash -x

terminal

```
$ bash -x backup.sh
+ dest=/home/mariam/backup-2026-10-24
+ mkdir -p /home/mariam/backup-2026-10-24
+ cp -r /home/mariam/Documents /home/mariam/backup-2026-10-24

$ PS4='+ line $LINENO: ' bash -x backup.sh
```

- bash dash x prints every command before running it, with variables already expanded. It …
- Turn tracing on and off around one section with set dash x and set plus x, and add the line …

04

ShellCheck

terminal

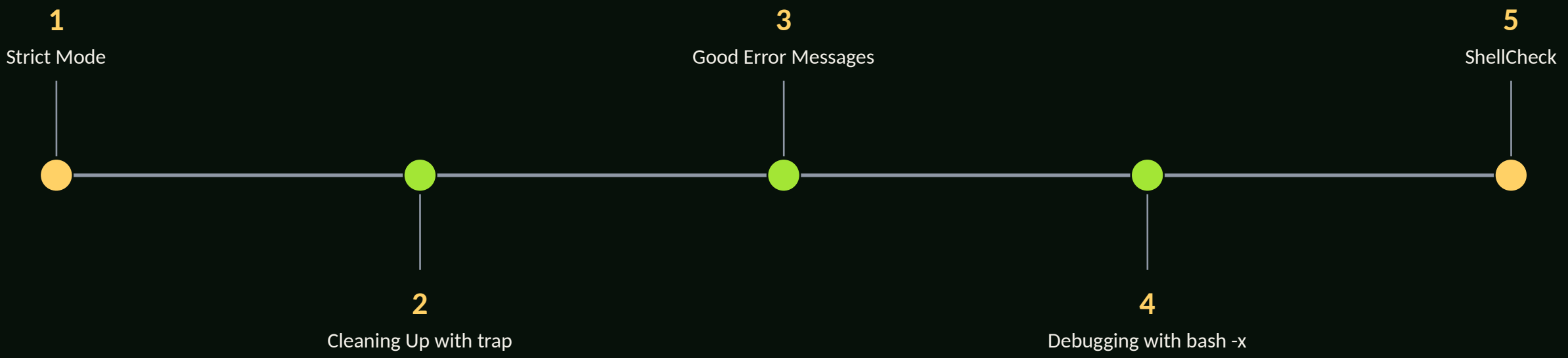
```
$ shellcheck backup.sh
In backup.sh line 4:
cp -r $HOME/Documents $dest
      ^-- SC2086: Double quote to prevent globbing and word splitting.

$ sudo apt install shellcheck     # or: brew install shellcheck
```

- ShellCheck is a free tool that reads your script and warns about bugs: missing quotes, …
- Install it and run it on every script, or add it to your editor. It is like having an …

05

Lesson Map


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Strict Mode
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Good Error Messages
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Debugging with bash -x
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ShellCheck

Sources and Further Reading

strict.sh

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die.sh

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Thank you for watching

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