04. More Shell Commands, Keyboard Shortcuts, Live Code

CPSC 120: Introduction to Programming
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Agenda

0. Sign-in sheet
1. Q&A
2. More Shell Commands
3. Keyboard Shortcuts
4. Live Code

1. Q&A

Q&A

Let's hear your questions about…

- This week's Lab
- Linux
- Any other issues

Reminder: write these questions in your notebook during lab

2. More Shell Commands

code

```
$ code [FILE...]
```

- [VS Code](): text editor
- Starts VS Code
- Each FILE... is opened in a tab

rm

`$ rm [OPTION...] FILE...`

- rm: **R**e**M**ove regular file
- by default, only deletes regular files (not directories)
- to delete directories, add the -Rf option:

  $ rm -Rf lab-5-directory

- -R: **recursive**; enter a directory, and its directories, and its directories...
- -f: **force**; delete hidden files, esp. git metadata

echo $?

```
$ echo $?
```

- Prints the **exit code** of the previous command
- 0 means success
- Positive or negative number means failure

clang++

`$ clang++ [OPTION...] SOURCE`

- clang++: open source C++ compiler
- SOURCE must be a path to a C++ source file
  - usually ends in .cc
- Tries to compile SOURCE
  - On failure, clang++ prints **messages** describing **syntax errors** or **warnings** (problems)
  - On success, creates an executable object code program named **a.out**
- (There are many OPTIONs to `clang++` that we'll cover later.)

Running your program; `./a.out`

`$ ./PROG`

- tldr; the command is **`./a.out`**
- To run a program
  - The command name is the path of the executable object code program file
  - For technical reasons, this must begin with a directory name
  - To run program **PROG** in the current directory, run **`./PROG`**
- The clang++ command on the previous slide creates program **a.out**
- To run it, use command

  `$ ./a.out`

3. Keyboard Shortcuts

Review: Shell and Terminal

- **Shell**: a special Unix program that allows a user (you) to run and interact with other programs
- **Terminal**: a thing that lets you see shell input/output
  - Physical terminal: monitor, keyboard, connection to real computer
  - Terminal emulator: program that simulates a physical terminal
- **Prompt**: when the shell is waiting for a command,
  It prints a "prompt" ending in $ (dollar sign)
- You type a **command**, then the Enter key to run the command
- Unix programs are **concise**: if everything worked, there is no stdout output

Review: Keyboard-First Principle

- Humans can type faster than they can click
- Excessive mouse moving causes Repetitive Stress Injury
  - RSI, Carpal Tunnel Syndrome
- **Keyboard-First Principle**: using keyboard is better than mouse

Cannot Move Cursor by Clicking

- Terminal does not have a mouse!
- Cannot click to move cursor
- Instead, use keyboard shortcuts

Keyboard Shortcuts

- **Tab:** if possible, **autocomplete**
    - tap twice to show possible completions
- **Left/Right** arrow: move cursor one character
- **CTRL+A:** move cursor to **beginning** of command
- **CTRL+E:** move cursor to **end** of command
- **Up/Down** arrow: scroll through command **history**
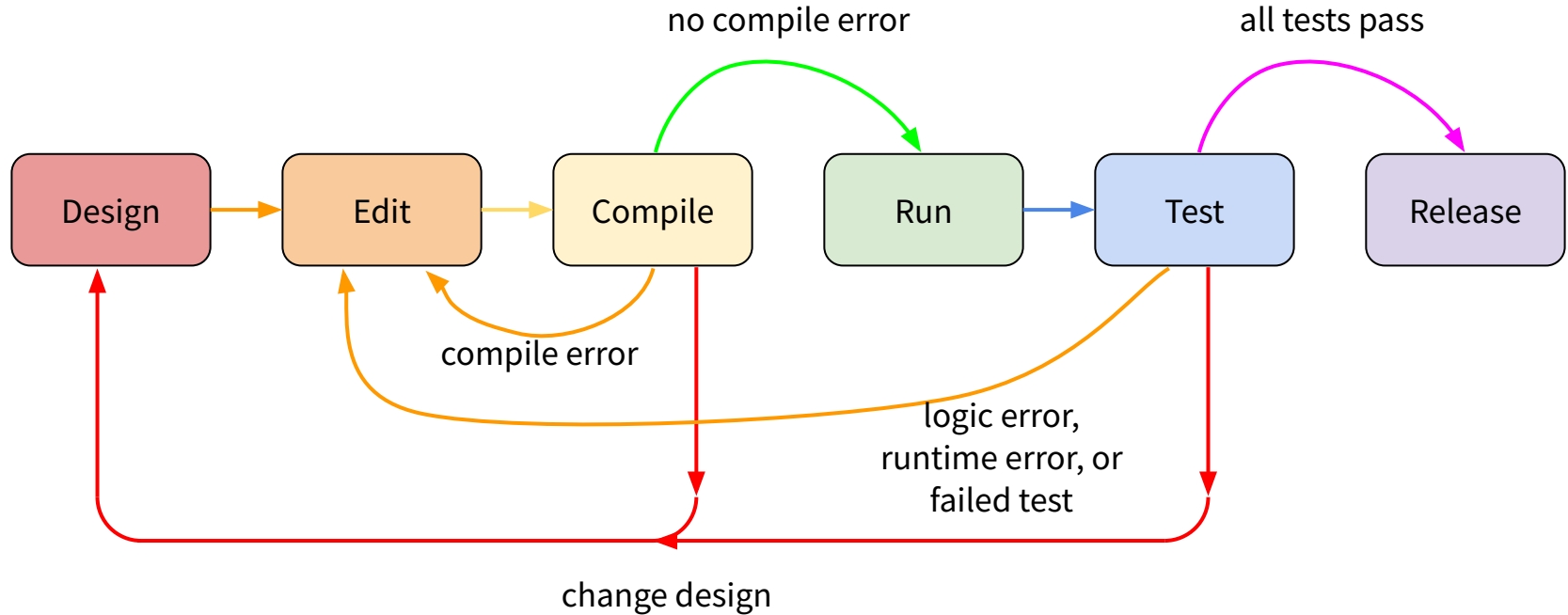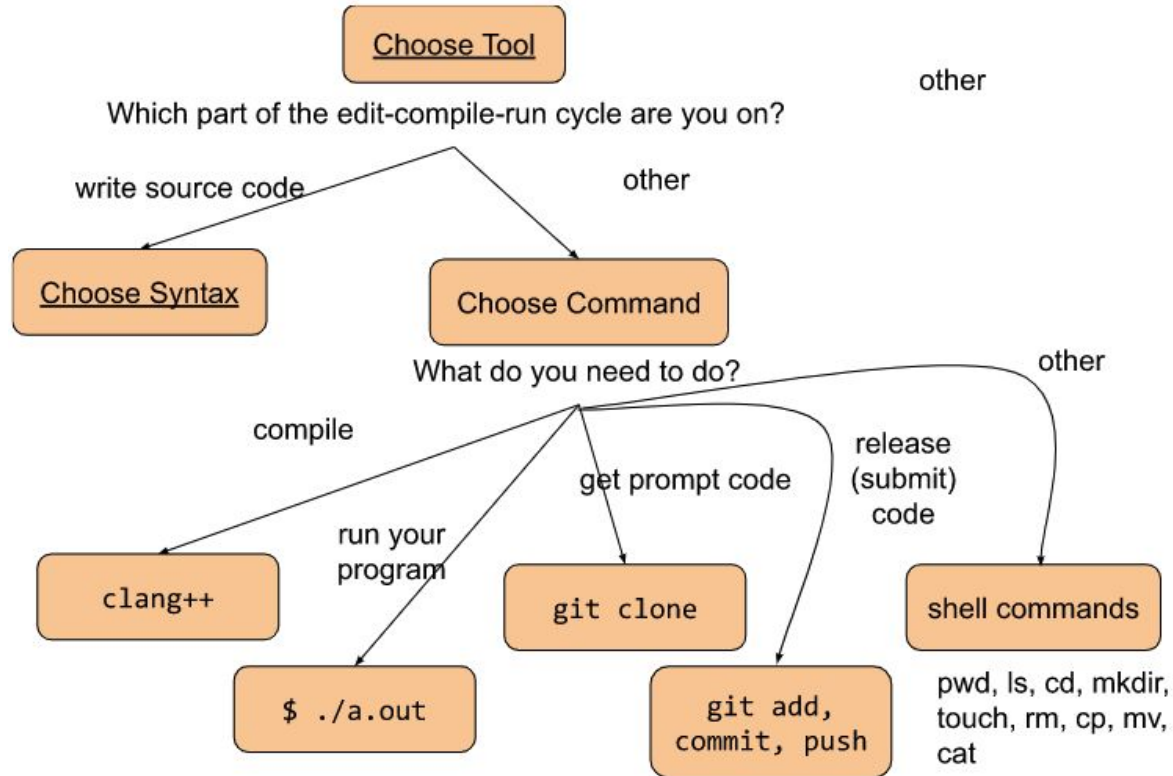- **CTRL+Shift+C:** copy
- **CTRL+SHIFT+V:** paste

4. Live Code

Live Code

- Interactive
- Instructor: **driver**
- Students: **navigators**
- Today:
    - Practice categorizing errors
    - Pingo survey
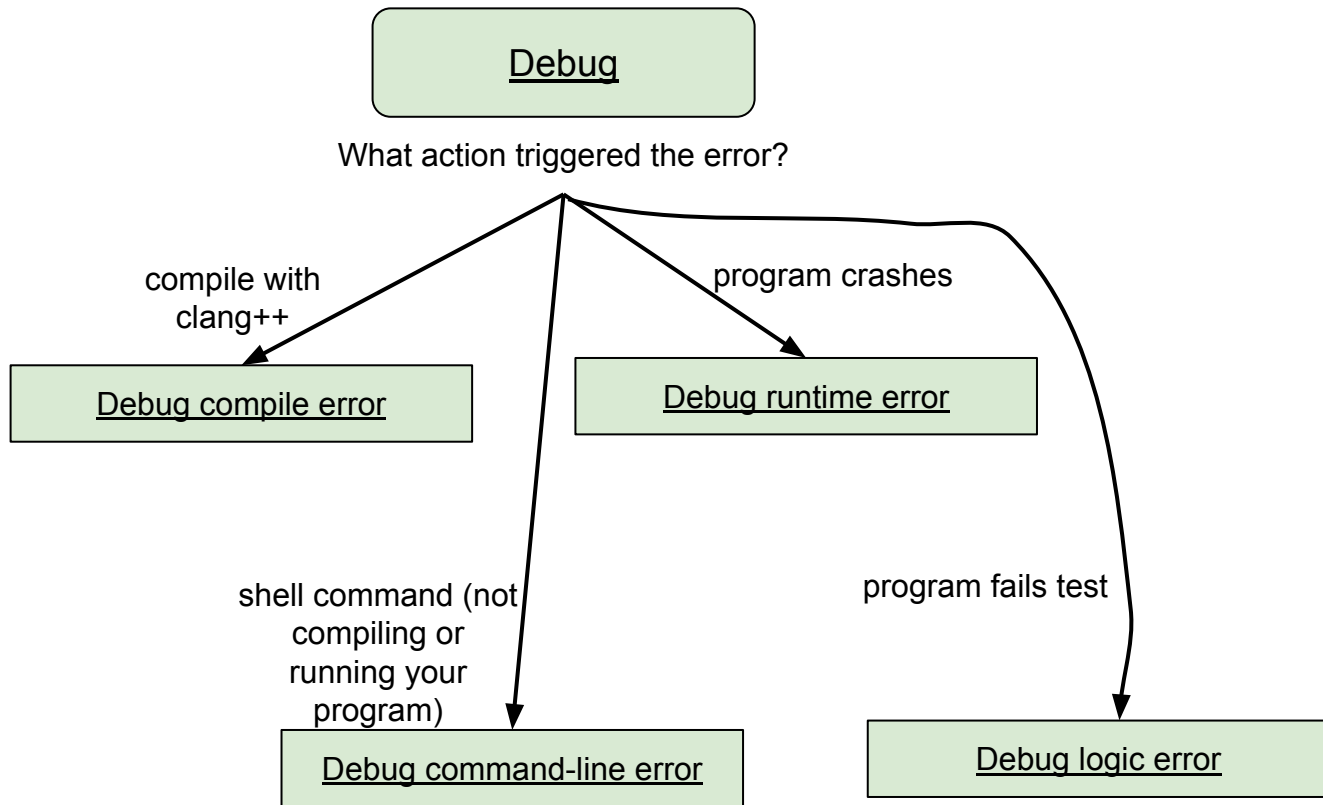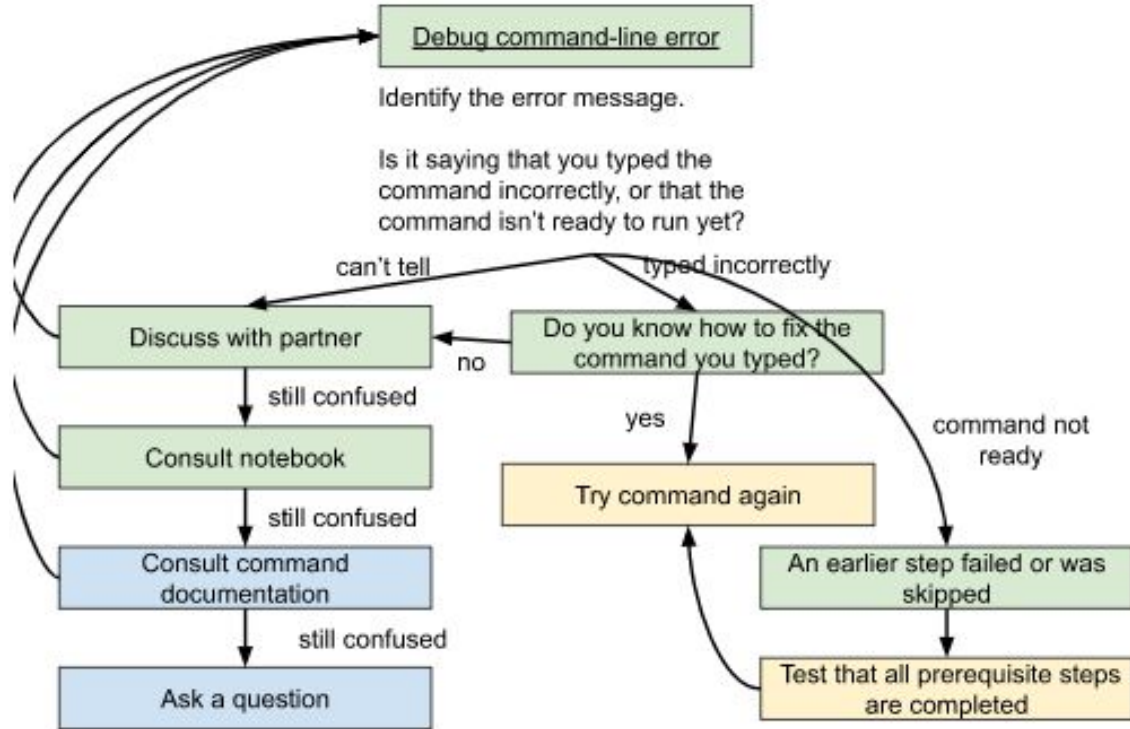
The Development Cycle

Review: **Choose Tool** Flowchart

Preview: Debug Flowchart
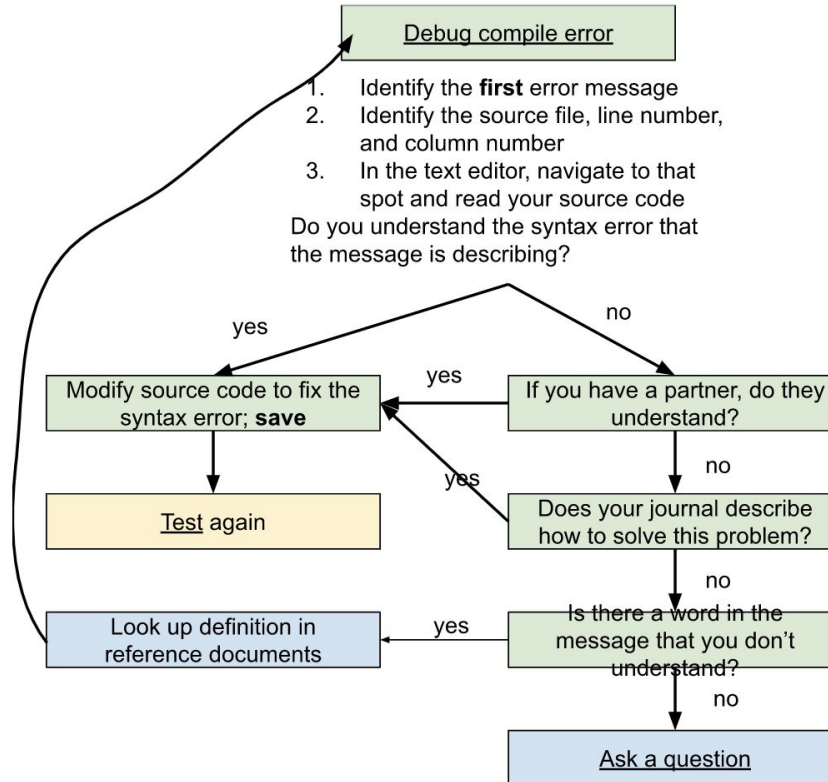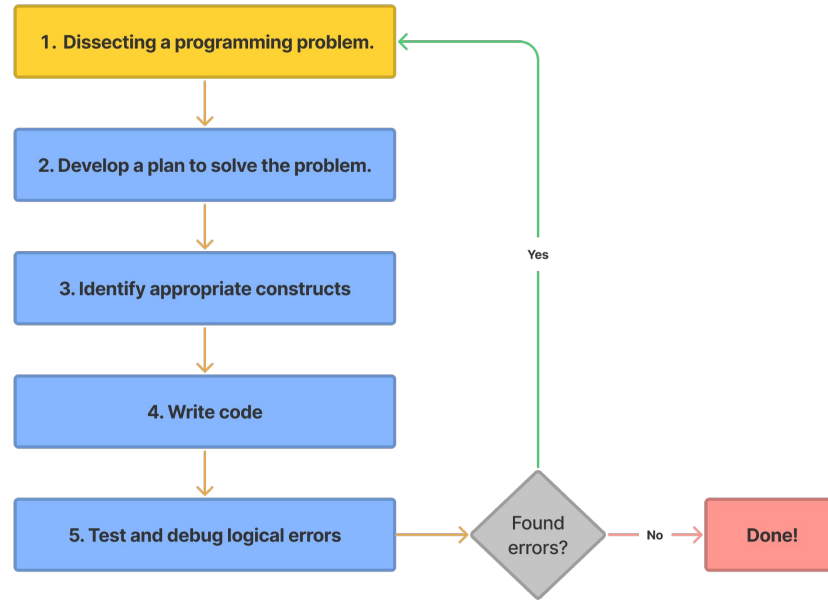
Debug

What action triggered the error?

compile with
clang++

program crashes

Debug compile error

Debug runtime error

shell command (not
compiling or
running your
program)

program fails test

Debug command-line error

Debug logic error

Preview: <u>Debug command error</u> flowchart

Debug command-line error

Identify the error message.

Is it saying that you typed the command incorrectly, or that the command isn't ready to run yet?

can't tell

typed incorrectly

Discuss with partner

no

Do you know how to fix the command you typed?

still confused

yes

command not ready

Consult notebook

Try command again

still confused

Consult command documentation

An earlier step failed or was skipped

still confused

Ask a question

Test that all prerequisite steps are completed

Preview: **<u>Debug compile error</u>** flowchart

Preview: Steps for Solving a Programming Problem

Prompt: Fancy Tip Calculator

- INPUT: subtotal of a restaurant bill
- OUTPUT: print out tax, tip, and total
- Sales tax = 7.75%
- Tip = 20%
- Total = subtotal + sales tax + tip