ccons

Interactive Console for the C Programming Language

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Project Goals

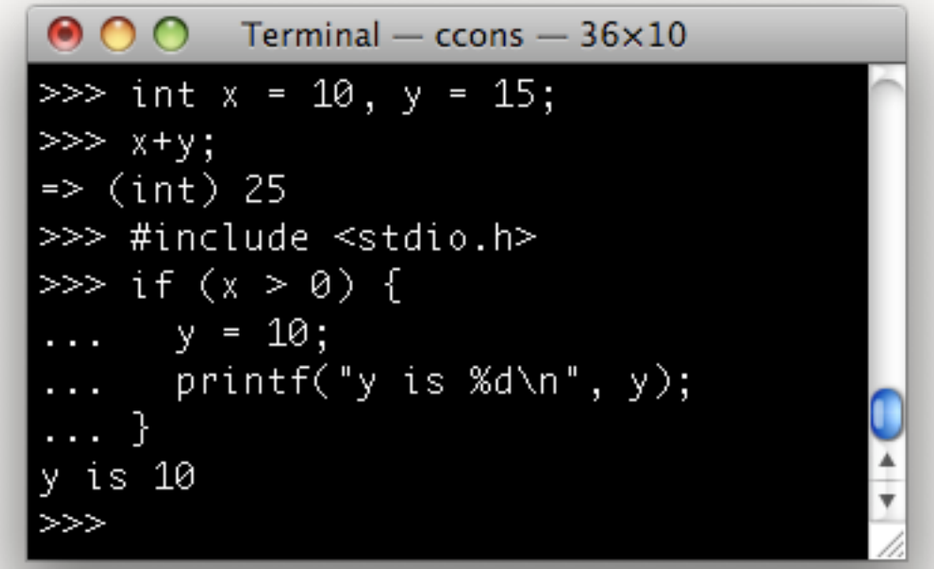
- Goal is to create an interactive console for C
- Let user enter C code interactively, line by line, and execute each line as it is entered
- Similar to interactive consoles that already exist for interpreted languages such as Python and Ruby
- Would allow C programmers to quickly try out code snippets and can serve as a useful tool for learning C

Libraries

- Built on top of existing Open Source libraries:
  - LLVM - Low Level Virtual Machine
    - http://llvm.org/
  - clang - C Language Frontend for LLVM
    - http://clang.llvm.org/
  - Editline - Command Line Editor Library
    - http://www.thrysoee.dk/editline/

Features - Basics

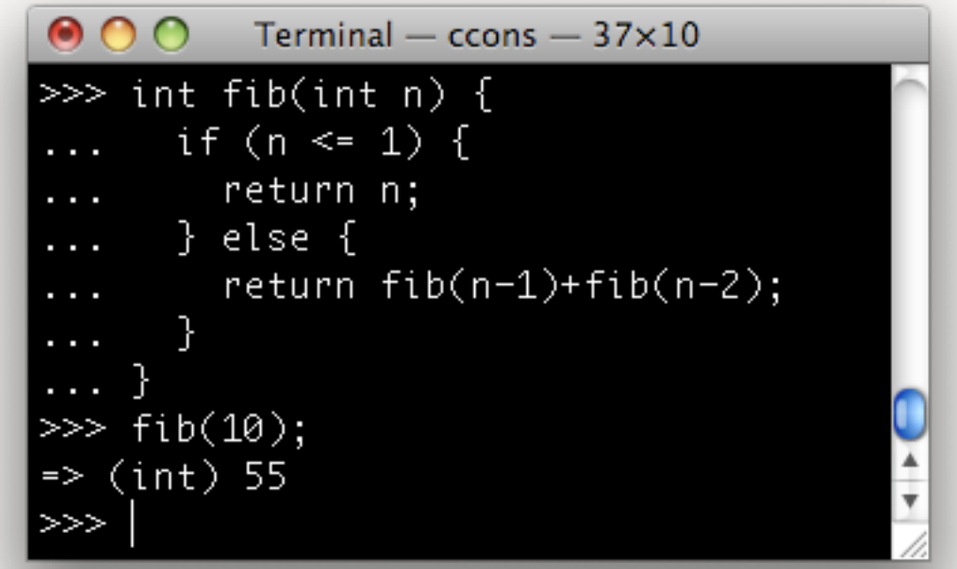
- Input C code, which is compiled and executed line by line
- Expressions are evaluated and the results displayed



- Can #include header files and call functions
- Blocks (if statements, loops, etc) are detected and the console goes into multi-line input mode

Features - Functions

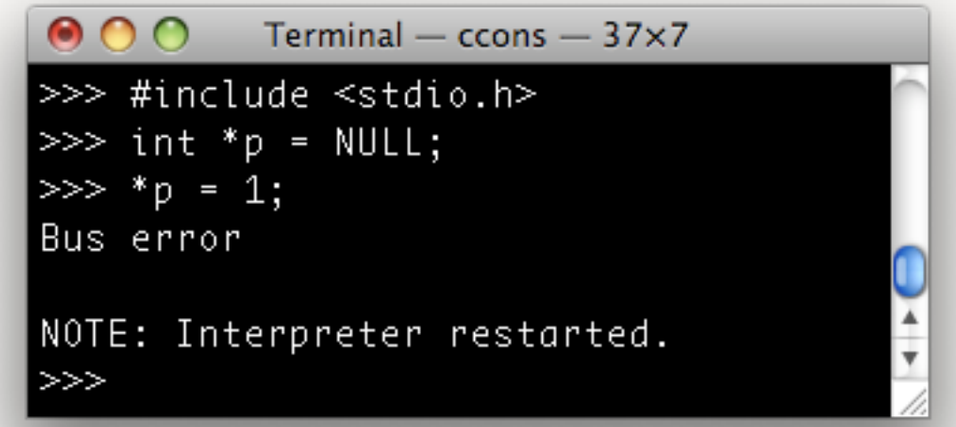
- Support for defining and executing functions
- ccons detects if the input is a function and treats it as a “top-level” element



- Functions can then be called - either directly, or from other functions or blocks

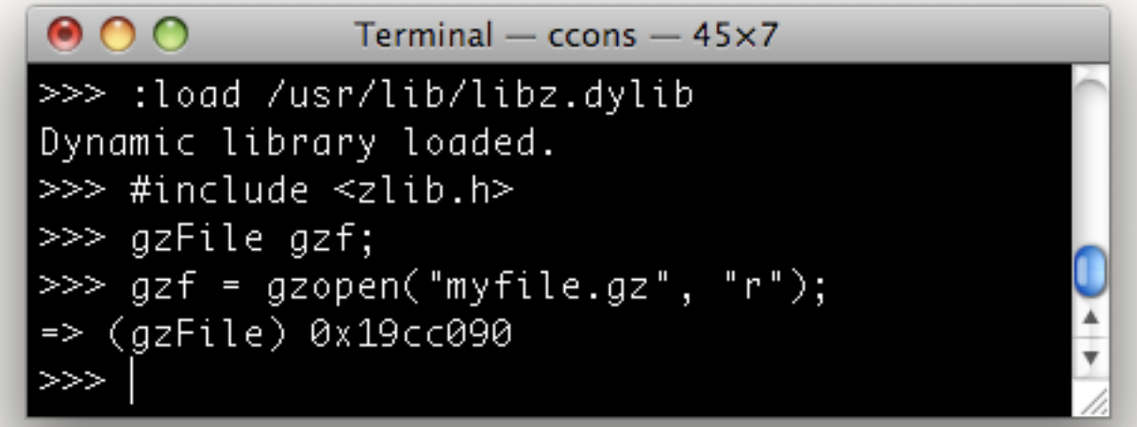
Features - Multi-Process

- In multi-process mode:
  - "front-end" process reads input from the user
  - sends user input over IPC to "back-end"
  - "back-end" process compiles input and executes it
- If the "back-end" process crashes due to executing bad code, the "front-end" process will restart it



Features - Libraries, Auto-complete, History

- Lets you dynamically load external libraries using :load command



- Once loaded, the library's functions can be called
- Provides auto-completion for filesystem paths
- Command history allows you to use UP and DOWN arrows to navigate through your previous input

Automated Tests

- Automated tests provide assurance that the system is working correctly
- Created with the **expect** UNIX command-line utility
- Tests specify input to ccons and the expected output
- Simulate a user who is entering input into the system

Open Source

- ccons is Free Software
- Source code is licensed under the MIT License
- Hosted in a Subversion repository on Google Code
  - http://code.google.com/p/ccons
- Anyone may download the code, compile it and use the software for any purpose
- Supports Mac OS X and Linux

Conclusion

- Interactive console that runs C code that is entered
- Uses open source libraries: clang, LLVM, Editline
- Supports line input, block input, defining functions
- Multi-process mode for robust handling of bad code
- Automated tests using UNIX expect utility
- Open source project - supports Mac OS X and Linux