COEN 175

Week 1 - Phase 1

TAs

- Chris Desiniotis: cdesiniotis@scu.edu
  - Office Hours: Friday 12 - 2 pm
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  - Office Hours: Thursday 11 - 1 pm

Introduction

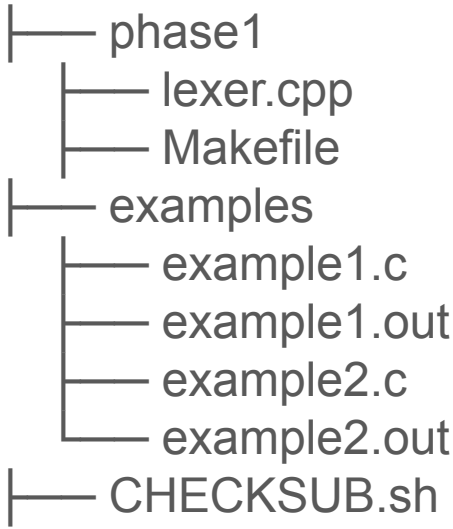
- Building a Simple C Compiler in 6 phases!
- Zoom
  - All lab sections and TA office hours will use the same Zoom link
  - Feel free to stop by other lab sections for extra help
- Submissions
  - Tar file uploaded to Camino
  - Due typically on Sundays at 11:59 pm (**-1pt for every minute late!**)
- Advice
  - Keep up with lecture material
  - Read the entire assignment very carefully (most questions can be answered there)
  - Start early
  - Write your own test cases
- Must run and compile on linux servers

How our Compiler Works

- **Read** in from standard input
- **Write** to standard output

- Running
  - ./scc < input.c > output.out OR ./scc use **cltr+d** for eof
- Testing
  - diff output.out test.out
    - Program is correct if there is no output

Recommended Directory Structure



Submitting

1. Create tar file (**phase1.tar**) containing your source code
2. Run CHECKSUB to make sure tar file works
    a. ./CHECKSUB.sh phase1.tar examples.tar
3. Submit tar file to camino
4. Recommended to redownload submission and run CHECKSUB a second time to confirm that the submission was successful

Phase 1 - Lexical Analysis

- Write a lexical analyzer
- Print out all lexical constructs (tokens) recognized from standard in
- All whitespace, comments, illegal characters to be ignored
- Use a data structure for keywords

- Example
  - Standard in: **123**
  - Standard out: **int:123**

Useful Libraries

- istream
  - cin.get(), cin.peek(), cin.putback(), cin.eof()
  - https://www.cplusplus.com/reference/istream/istream/
- cctype
  - isdigit(), isalpha(), isalphanum()

Examples

```
[agigliot@linux11105 phase1]$ make
g++ -std=c++11 -g -Wall   -c -o lexer.o lexer.cpp
g++ -std=c++11 -o scc lexer.o
[agigliot@linux11105 phase1]$ ./scc
1
int:1
123
int:123
break
keyword:break
testing123
identifier:testing123
[agigliot@linux11105 phase1]$
```

```
[agigliot@linux11105 1]$ ./CHECKSUB.sh phase1.tar examples.tar
Checking environment ...
Checking submission ...
Extracting submission ...
Extracting examples ...
Compiling project ...
g++ -std=c++11 -g -Wall   -c -o lexer.o lexer.cpp
g++ -std=c++11 -o scc lexer.o
Running examples ...
fib.c ... ok
hello.c ... ok
list.c ... ok
malloc.c ... ok
sum.c ... ok
tricky.c ... ok
[agigliot@linux11105 1]$
```

```
[agigliot@linux11105 phase1]$
[agigliot@linux11105 phase1]$ ./scc < fib.c > test.out
[agigliot@linux11105 phase1]$ diff test.out fib.out
[agigliot@linux11105 phase1]$
```