Computer Systems Org Recitation 009

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Today

- C Functions
- C scopes
  - Local
  - Global
- C Pointers
  - Single
  - Double
- Links
  - Ascii:https://www.cs.cmu.edu/~pattis/15-1XX/common/handouts/ascii.html

Basic Unix/Linux commands

- **man** - manual
- ls - list
- cd - change dir
- pwd - current dir
- mkdir - make an empty dir
- cp - copy
- mv - move
- rm - remove
- echo - write arguments to the standard output
- cat - output content of a file
- wc - word count
- grep - pattern matching
- touch - create a file

- Google/ man
- https://github.com/jlevy/the-art-of-command-line

Git

- Git config
  - https://stackoverflow.com/questions/35942754/how-to-save-username-and-password-in-git-gitextension
  - git config -- global credential.helper store
  - git pull
- Git commands
  - git clone <url>
  - git status
  - git add
  - git commit -m “<your message>”
  - git push origin <branch>
  - git pull origin <branch>

Makefile

A good Makefile:

```
myprogram: main.o util.o
  gcc main.o util.o -o myprogram
main.o: main.c
  gcc -c main.c -o main.o
util.o: util.c
  gcc -c util.c -o util.o
clean:
  rm -f main.o util.o myprogram
```

- Make supports pattern matching with the %
  - %.c means all .c files
- Make has “automatic variables”
  - The meaning of variables within a rule is contextual
  - $@ is the name of the rule
  - $^ is the list of dependencies
- Example:

```
%.o: %.c
  gcc -c $^ -o $@
```

C basics

- Basic Data types
  - integer - signed, unsigned
  - char, string (char*)
  - float, double
  - struct, class
- Functions
- Conditions
- Loops
  - for
  - while
- Pointers
- Data structures
  - Array (of int, char, etc)
  - Stack (FILO/ LCFS)
  - Queue (FIFO/ FCFS)
  - Tree (Binary…)
  - Heap