Lab 2

School of Architecture, Civil and Environmental Engineering

EPFL, SS 2016-2017

http://disal.epfl.ch/teaching/signals_instruments_systems/
Lab 2 Outline

• Concepts:
  – Makefiles
  – Compiling / modular programming
  – C versus Matlab programming performance
  – Structures variables + bitwise operators

• Tools:
  – gcc (C compiler)
  – Matlab
Practical Programming Tips

• Plan your program
  – Which files (.h and .c) do you need?
  – Which functions (input/output) do I need?
• Write small code bits at a time, and re-compile often!
• When debugging use `printf` to track the state of variables
Some standard C libraries

• Question 8:  `string.h`
• Question 22:  `math.h`

• Don’t forget to include them in the c files using the `#include`

• More information in:  `http://www.cplusplus.com/`
Run matlab in Linux

• Open a terminal

• Write:
  >>matlab
Help on matlab functions

• In MATLAB command window

• Write:
  >> doc function_name
If you have Linux problems running certain commands ... Upgraid your terminal to Bash

- Go to:

  https://cadiwww.epfl.ch/accountprefs

Login with your GASPAR username and password
Upgraid your terminal to Bash

1) Click “Modifier”
2) Change shell to “/bin/bash”
Bitwise operators – Example

locating road cracks

1 road = 50km
100GB memory

Real image
(high resolution)

(RGB)
4096x4096x3 bytes
= 50 MB

(Only one
picture/20m)

Compressing image:
char b = is_crack(buff_im_r[i],
buff_im_g[i],
buff_im_b[i],);
buf_mem[i/8] =
buf_mem[i/8] | (b << (i % 8));

Bitwise storage:
4096x4096x(1/8) bytes
= 2 MB

(Binary image (1 or 0)
(more than one
picture/m!))