Lab 2

School of Architecture, Civil and Environmental Engineering

EPFL, SS 2014-2015

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 6:  `string.h`
• Question 19:  `math.h`

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

Run matlab in Linux

• Open a terminal

• Write:
  >>matlab
Upgrad your terminal to Bash

- Go to:

  https://dinfo.epfl.ch/cgi-bin/accountprefs/

Login with your GASPAR username and password
Upgraudit 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
= 50MB

(Only one picture/20m)

Compressing image:

```c
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:

```c
4096x4096x(1/8) bytes
= 2MB
```

Binary image (1 or 0)

(Only more than one picture/m !)