**Introduction to Computer Science
W 1113 – Lab (C)
Lab7**

Suhit Gupta
3/11/04

Questions about the previous lab

2

Questions about HW3

3

Recap from Lab 5

- Basically a recap from Lab 4
- Function prototypes
- Conditional statements
  - if
  - switch
- Loops
  - while
  - do while
  - for

4

Recap from Lab 6

- Code blocks
- Global variable scoping
- Two dimensional arrays
  - arrays of strings
- Debugging

5

Readme

- Write a README file
- Write a good README file
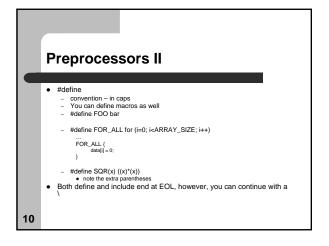- It doesn't have to be overly verbose

6

Comments

- Writing comments
- Writing good comments
- Often, naming variables well is a form of self-commenting code

7

Function prototypes

- Who does not understand them?
- Three types of submissions in HW2
  - everything in main() {…}
  - function before main, so you did not have to use function prototypes
  - function after main, but lucky this time

8

Preprocessors

- I already went over these two but here is a recap, and some more detail
- #include
  - /usr/include – stdio.h, stdlib.h, math.h, string.h, ctype.h, limits.h
  - If you use include math.h, then you need a –lm at the end of your compile command

9

Preprocessors II

- #define
  - convention – in caps
  - You can define macros as well
  - #define FOO bar

  - #define FOR_ALL for (i=0; i<ARRAY_SIZE; i++)
    ```
    …
    FOR_ALL {
        data[i] = 0;
    }
    ```

  - #define SQR(x) ((x)*(x))
    - note the extra parentheses
- Both define and include end at EOL, however, you can continue with a
\

10

Preprocessors III

- #ifdef (pg. 146) + #ifndef, #undef, #endif, #else
  - Conditional compilation

```
#ifdef DEBUG
    printf ("The code reaches this point\n");
#endif
```

- Now you can use #define DEBUG or #undef DEBUG

11

Bit operators

- ~ (unary operator) – Not
- | - Or
- & - And
- ^ - Xor (exclusive or)

12

4

Shift operators

- << - Left shift
  - Shifting left by 1 multiplies by 2
  - Shifting left by 2 multiplies by 4, or 2^2
  - Therefore, shifting left by n, multiplies by 2^n
- >> - Right shift (see Part II, Question 2, midterm)
  - Right shift divides by 2

13

Debugging

- "gcc –Wall <filename.c> will generate warnings
- gdb
  - gcc –Wall –g <filename.c>
- ddd
  - You run these two on a.out
  - run, bt, breakpoint, skip, step, lots of commands
  - step is good for loops

14

HW3 and Midterm questions…

- If we have time.

15

Assignment

- Read Ch. 10, 11 from the Practical C Programming book
- Read Ch. 12 for next class

- **HW3**
  - Don't wait too long

16