

CS201 – Expressions & I/O

Precedence

- What is the value of $2 + 3 * 4$?
- 20 or 14 ?
- Without parentheses, there are a set of rules to fall back on.
- Unary + - first
- * / % second
- Binary + - third
- So, under these rules, the answer is 14

Use parentheses

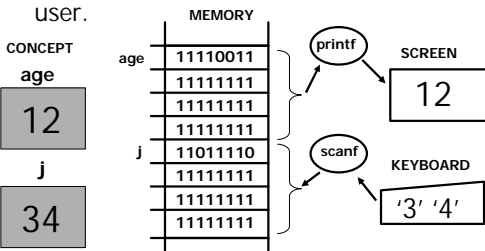
- To avoid problems always use parentheses.
- $2 + (3 * 4)$
- They're not needed but they aid readability.
- $(2 + 3) * 4$
- Here they are needed.

Integer Division

- What is the value of $2/4$?
- What about $2.0/4.0$?
- When in doubt, try it! output
 - `printf("%d", 2/4);` 0
 - `printf("%f", 2/4);` 0.000000
 - `printf("%d", 2.0/4.0);` 0
 - `printf("%f", 2.0/4.0);` 0.500000

CS201 – C formatted I/O

- Internal representation hidden from user.



printf & scanf (f = formatted)

- `printf("formatting codes", variables);`
- For formatting codes see man 3 printf or look at Table 2.11 – Table 2.13 in text.
- Use d for integers. `%#d`
 - % - start of place holder
 - # - field width (optional)
 - d - place holder for integers

%#d (for integers)

- 61 using %4d would display ??61
 - ? stands for a displayed blank
 - Note four characters output
 - No decimal point
- -342 using %4d would display -342
- -1234 using %4d would display -1234
 - Field width is expanded to fit.

%n.mf (for floating point) float & double

- % start of place holder
- n field width (optional)
- m number of decimal places (optional)
- f place holder for floating point
- 61.45 using %f 61.450000
- 61.45 using %5.2f 61.45
- 61.45 using %5f 61.450000 *
- 61.45 using %5.f ???61
- 61.45 using %5.1f ?61.5
- 61.45 using %8.2f ???61.45
- * If the precision is missing, 6 is assumed.

Redirection

- You can "redirect" the input sent to a scanf or the output sent from a printf using the shell symbols '<' or '>'.
- \$ program_name < data_in_file_name
 - Take input from "data_in_file_name"
- \$ program_name > data_out_file_name
 - Send output to "data_out_file_name"
- \$ prog < indata > outdata
 - Take input from "indata" AND send output to "outdata"

External Data Files

- File names can be dynamically chosen using redirection.
- File names can be "hard coded" in the program. See Figure 2.14 (more in chapter 12)

Common Errors

- Syntax errors
 - Found at compile time!
 - Usually easy to fix!
- Run-Time errors
 - Found at run time!
 - Usually harder to fix!
 - Often Logic errors!
- Undetected errors
 - Most difficult to find and fix!