10-C Code Constructs

Errata:
pg. 111 Line -16 s/, 0/, 1/
pg. 111 Line -15 s/, 1/, 2/
Different Kinds of References

- **Global variables** have specific memory addresses associated with them.
- **Local variables** are indexed relative to the frame pointer (ebp) with negative offsets.
- **Arguments** are indexed relative to ebp with positive offsets.
- **Non-persistent temporary values** are often indexed relative to the stack pointer (esp) with positive or zero offsets.
Stack Pointer Follies

- Look at the example of Listing 6-1 using gdb.
- Note the immediate operands.
- Look at the example of Listing 6-2 using gdb.
- What is happening with the stack pointer? How does gcc prepare it correctly?
Math Operations In Assembly

• Look at the program of listing 6-6 in gdb.
• Note that gdb does something really strange for the mod operation!
If Statements

- Look at the program of Listing 6-8 in gdb.
- Look at 6-10 as well.
Loops

• Look at the program of listing 6-12 with gdb.
Function Calls

- cdecl
  - Parameters pushed on right to left
  - Caller cleans up the stack (takes arguments off)
- stdcall
  - Parameters pushed on right to left
  - Callee (the function itself) cleans up the stack
-fastcall
  - First few arguments are passed in registers.
  - Additional arguments pushed right to left
- gcc oddity: gcc allocates stack frames to units with addresses divisible by 16*
- *To satisfy alignment requirements of the SSE2+ x86 architectures (thanks Nez).