Various Topics

9-25-2001

Opening Discussion

- What did each of you read?
- Where were any questions or points of interest from the readings?

Formal Grammars

- One of the concepts that you need to understand for the papers that you will be looking at are formal grammars. In particular context free grammars are used to represent the structures of programming languages.
- In CS we typically deal with the grammars of the Chomsky hierarchy
  - regular, context-free, context-sensitive, and recursively enumerable
Chompsky Grammars

- In this system grammars have sets of terminal and non-terminal elements. In simple examples, the terminals are represented by lowercase letters and the non-terminals by uppercase letters.
- It also has a set of productions which specify how changes can be made to a string of characters. The complexity of the production set determines what type of grammar it is.

Context-Free Grammars

- A context-free grammar is one that takes a single non-terminal character and changes it into some string of terminal and non-terminal characters.
- The following grammar has the ability to generate strings of the form $a^n b^n$.
  $S \rightarrow aSb \mid ab$
- No CF-grammar can produce $a^n b^n c^n$.

Multiple Inheritance

- The paper on multiple inheritance in C++ begins with a brief discussion of why you would want to do multiple inheritance at all.
- It then goes into a discussion of how multiple inheritance is handled and implemented in C++.
- Some interesting points surround ambiguities of different forms.
Hardware Considerations

- Computers have gotten faster in many ways over recent years, but not all components have kept pace equally.
- In particular the memory subsystems have failed to keep pace with the processors. There have also been costs associated with having higher clock rates such as longer pipelines.

Latency

- The latency of an operation is how long the processor has to wait before a given operation can be completed. Whether the processor can do anything else while waiting depends on other details of the processor.
- I found some references that give the latencies on different chips for different operations.

Minute Essay

- Next week I will be presenting information on some of the stuff that you need to know to understand the nomenclature of papers we are going to read. I will also cover some information related to how data flow is tracked through programs by compilers.
- Are there any things that you think you should know about that haven’t been covered sufficiently?