Control

CS4700

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Selection

- Statements that allow conditional execution

Two way

- If - then - else
- What is the type of the control expression?
- What is the form of the clause?
  - Single statement?
  - Block?

Nesting ambiguity

- if e1 if e2 c1 else c2
- Where does the else belong?
- Only occurs if clause form permits

Multiple Selection

- Switch - Case - Patterns
- What is the form of the selection expression?
- How are the cases specified?
- What if nothing matches?

Multiple Selection Implementation

- Nested ifs
- Tree - (Command Pattern)
- Jump tables

Iteration

- Used for repetition
- How is it controlled
- Where does the control structure appear
- Can be replaced by recursion

Counter Controlled Loops

- Has a loop variable
- Loop variable has a begin, end, and step
- For
- For each

Logically Controlled Loops

- Has a condition
- Is the test before or after the loop
- while(e)
- do .. while(e)

Loop Control Statements

- User located loop exits
  - break
  - last
- Skip statement
  - continue
- Used to eliminate some uses of goto

Unconditional Branch

- Most flexible and powerful of statements
- Other control structures an be implemented in terms of goto
- Some languages don't have it

Goto Considered Harmful

- Dijkstra's 1968 seminal paper

Guarded Commands

- Introduced by Dijkstra in 1975
- A block of statements with boolean guards
- One expression whos guard is true is executed.

Textbook sections covered:

- Section 08-02 (frame 2)
- Section 08-03 (frame 7)
- Section 08-04 (frame 11)
- Section 08-05 (frame 13)