# The Cornell Program Synthesizer: A Syntax-Directed Programming Environment

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## Syntax-Directed Programming Environments

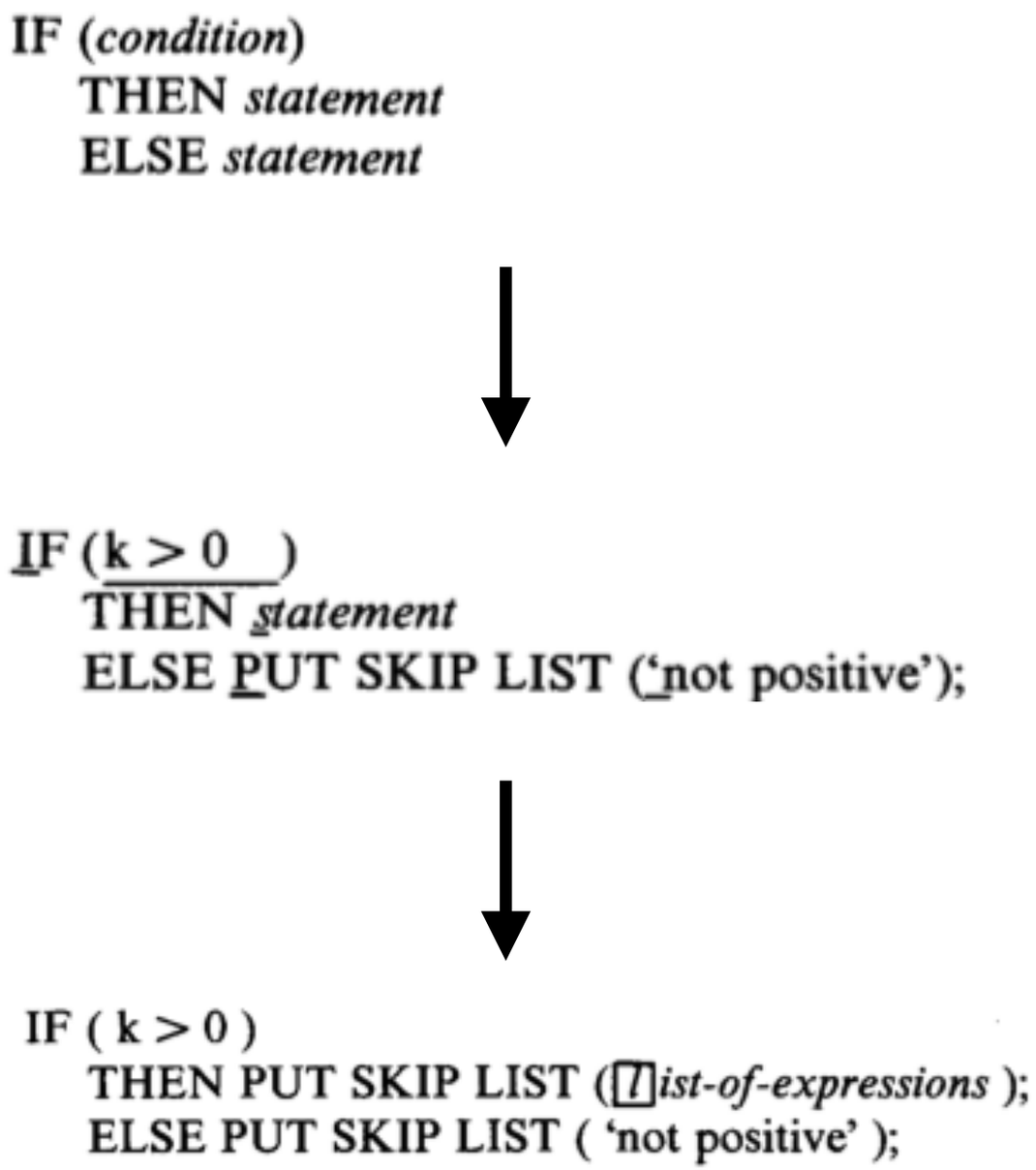
- Offer a unified programming environment that enables developers to work with code at higher level of abstraction

- Enable step-wise refinement, where developers start at high-level and work downwards

- Spare developers from mundane and frustrating details of programming syntax

# Key Idea: Program Templates

- Rather than work with characters, developers use commands to insert program templates
- Inserts all necessary keywords
- Leaves *placeholders* that can be filled by text of the correct type
  - e.g., statement, condition



# Working with program templates

```
IF ( k > 0 )
    THEN PUT SKIP LIST ( list-of-expressions );
    ELSE PUT SKIP LIST ( 'not positive' );
```

- All edits occur through templates
  - Cursor only moves through template, phrase, placeholder
  - Errors can occur only in phrases, not templates
    - Error detection can give more precise immediate feedback
- Structural modification commands can edit, delete, move, copy program units
- Can fold (hide) program elements to summarize less relevant sections

# Questions for discussion

- Overall reaction to the paper

- Would you use such a system for your everyday programming?
  - Why or why not?

- What are the pros and cons of structured editors compared to modern IDEs?