CSE 309: Compiler

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Course Syllabus

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- Introduction to compiling

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- Introduction to compiling
- Basic issues of compiling

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- Introduction to compiling
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- Lexical analysis

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- Introduction to compiling
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- Syntax analysis

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- Syntax analysis
- Syntax-directed translation

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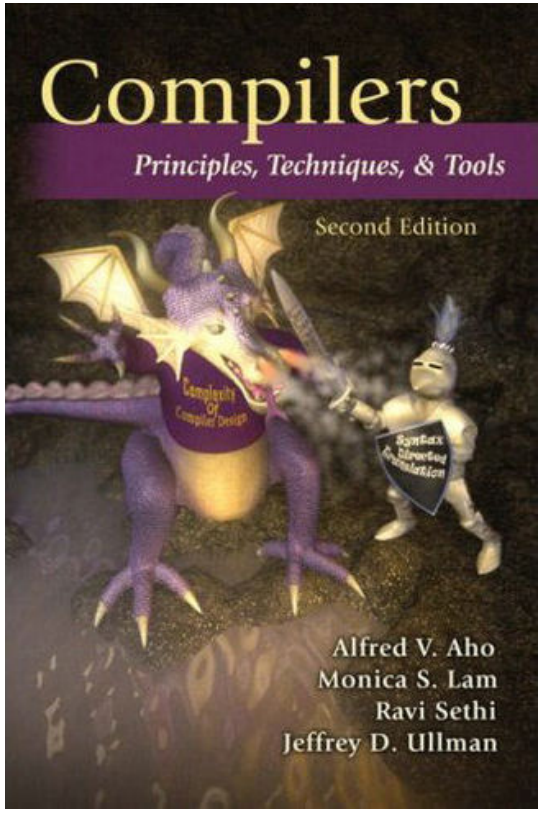
- Code generation
- Code optimization

Reference Book

- Compilers: Principles, Techniques, & Tools, *Second Edition*
  - Alfred V. Aho
  - Monica S. Lam
  - Ravi Sethi
  - Jeffrey D. Ullman



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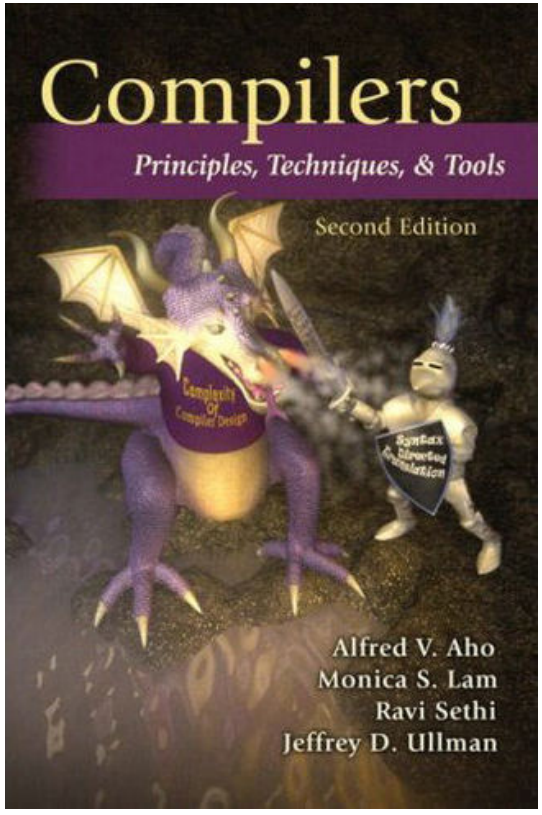

and other materials

Today's Topic

Syntax-Directed Translation

Syntax-Directed Translation

Syntax-Directed Translation

```
207 subprogram_declaration: subprogram_head declarations compound_statement
208             {
209                 printf("\nsubprogram_declaration -> subprogram_head declarations
    compound_statement\n");
210                 char *temp=new char[50];
211                 getTemp(temp);
212                 st.insert(temp,"temp");
213                 SymbolInfo *n=st.uplook(temp);
214                 n->code+="\n";
215                 n->code+=$1->symbol;
216                 n->code+=" proc\npush ax\npush bx\npush cx\npush dx\n";
217                 n->code+=$3->code;
218                 n->code+="\npop dx\npop cx\npop bx\npop ax\nret\n";
219                 n->code+=$1->symbol;
220                 n->code+=" endp\n";
221                 $$=n;
222                 delete [] temp;
223             }
224             ;
225 subprogram_head:     FUNCTION ID arguments COLON standard_type SEMICOLON
```

Syntax-Directed Translation

- source language translation is completely driven by Syntax analyzer or, Parser

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- grammar written for parsing is augmented with information to control,

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attribute grammar

Attribute Grammar

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- each grammar symbol is associated with attributes,

Attribute Grammar

- each grammar symbol is associated with attributes,
  - value

Attribute Grammar

- each grammar symbol is associated with attributes,
  - value
  - type

Attribute Grammar

- each grammar symbol is associated with attributes,
  - value
  - type
  - memory location