450 COMPILERS

COMPUTER SCIENCE
News

- Xamarin for Everyone
- CMPS 277/377
  - Mobile Development
  - Web Development
  - Enterprise Development
Administrivia

- Lab 01
- Lab 02 Thursday
- Phase I
Review

- Compilers
  - A program or set of programs that transforms source code written in a programming language (source language) into another computer language (target language)

- Lexicon
  - The vocabulary of a language
    - An analogy is to the dictionary of the English language
Review Continued

• Syntax
  • the set of rules, principles, and processes that govern the structure of sentences in a given language
Compilers

- Lexical Analysis
- Syntax Analysis
- Semantic Analysis
- Intermediate Code Generation
- Code Optimizer
- Code Generation
Lexical Analysis

- Also known as linear analysis
- Groups stream into tokens
- Ex. in C/C++
  - position = initial + rate * 60;

Groups tokens
- identifier position
- Assignment symbol =
- Identifier initial
- Plus sign +
- Identifier rate
- Multiplication sign *
- Integer 60
Syntax Analysis

- Also known as Hierarchical analysis or parsing
- Grouping tokens into grammatical phrases and are represented as a parse tree
- INSERT IMAGE of PARSE TREE
Semantic Analysis

- Checks the source program for semantic errors and gathers type information for code generation
- Uses hierarchical structure determined by syntax analysis to identify operators and operands
Backus-Naur Form

- The Extended/BNF is code that expresses the grammar of a formal language
- Consists of terminal symbols and non-terminal symbols
Open Source Compilers

- LLVM
  - Low Level Virtual Machine
- Roslyn