CS251: Introduction to Language Processing

Introduction

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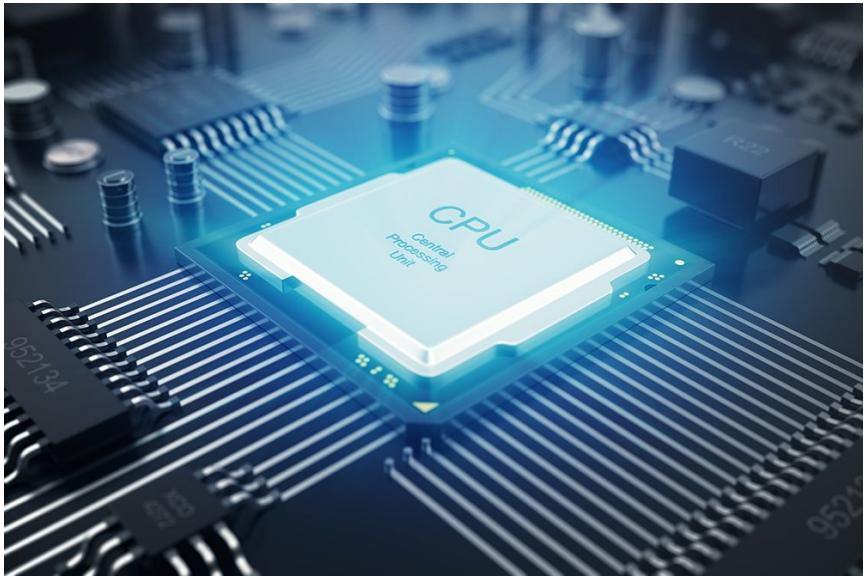
2023-24-M

Motivation



- Machines
  - Powerful
  - Computations
  - Operations
  - Circuits

Motivation

- *How to communicate with machines?*
- Machine code
  - Tedious to program
  - Huge man power
  - Inefficient
  - Error prone

Programming Languages

Problem?

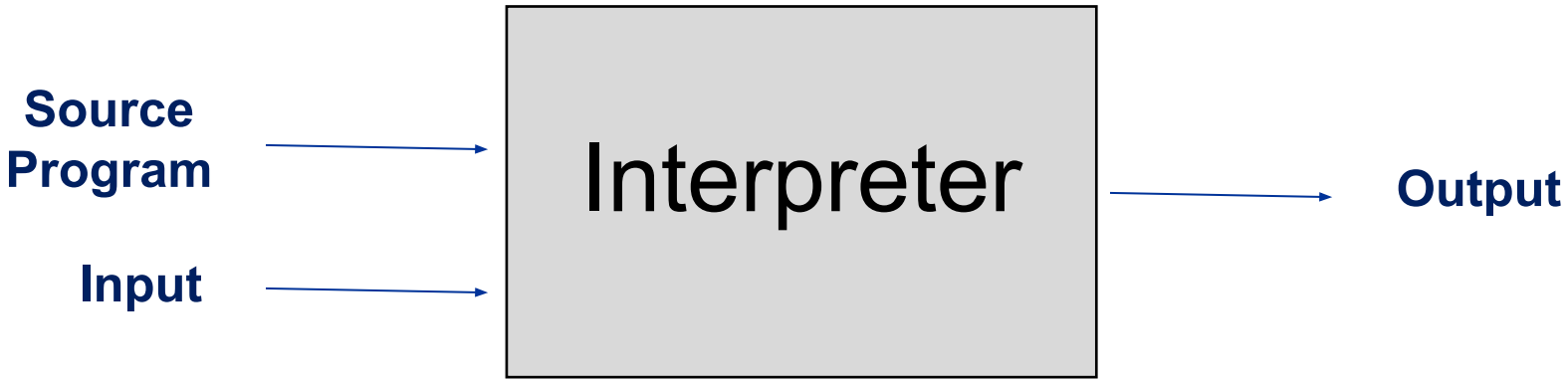
Compilers

Higher-Level Languages

Machine Code

Language Processing: Compilers

Language Processing: Interpreter



Compilers History

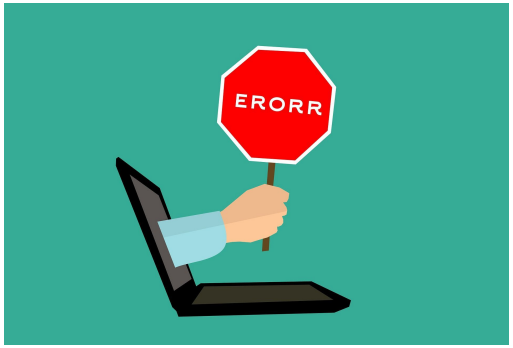
- The first practical compiler
  - **Corrado Böhm** in 1951 for PhD thesis

- The first commercial compiler
  - Fortran
  - Team led by **John W. Backus** at IBM in 1957
  - High-level language expression to machine code

Desired Characteristics

Correct: Preserve semantics

Fast: Less execution time



Error Handling

Outcome of the Course?

- Concepts/knowledge of compiler design
- Able to develop compilers
- Gain ability to modify the open-source/large compilers
- Ofcourse, grade!

Course Outline

- Introduction (this lecture)
- Lexical analysis
- Syntax analysis
- Semantic analysis
- Intermediate code generation
- Code optimization (machine indep)
- Code generation
- Optimizing code generation (machine dep)

Course Logistics

- Lecture Hours:
  - Monday 11:30 am - 12:25 pm
  - Wednesday 8:30 am - 9:25 am

- Course Website: Canvas platform
  - Lecture notes
  - Submitting assignments
  - Discussions
  - Marks

Course Logistics

- Text book:
  - Compilers: Principles, Techniques, and Tools by Aho, Sethi, Ullman and Lam
- Tools:
  - Lex and Yacc for programming assignments

Course Logistics

- Evaluation scheme (can be changed slightly):
  - Programming assignments (4-5): ~40%
  - Mid Sem Exam: ~20%
  - End Sem Exam: ~30%
  - Attendance: ~10%

- Attendance
  - 0% - 50%: 0 Marks
  - >50%: Marks will be awarded out of 10 accordingly.
  - Example:
    - Total sessions: 16
    - #sessions attended = 7 (<50%), marks = 0
    - #sessions attended = 10 (62.5%), marks = 2.5 (2*10/8)

Course Logistics

- Assignments:
  - Will be done in a team (size utmost 2)
- Policy:
  - Penalty for late submission: 20% for each day
  - Acknowledge all the sources
  - **Severe penalty for cheating**

Course Logistics

- Demos and Tutorials
  - Lex and Yacc

Course Logistics

- Questions:
  - Contact me: vishwesh@iitbhilai.ac.in
  - Use the forum:
    - Canvas - I will mail you the details.

Thank you!

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