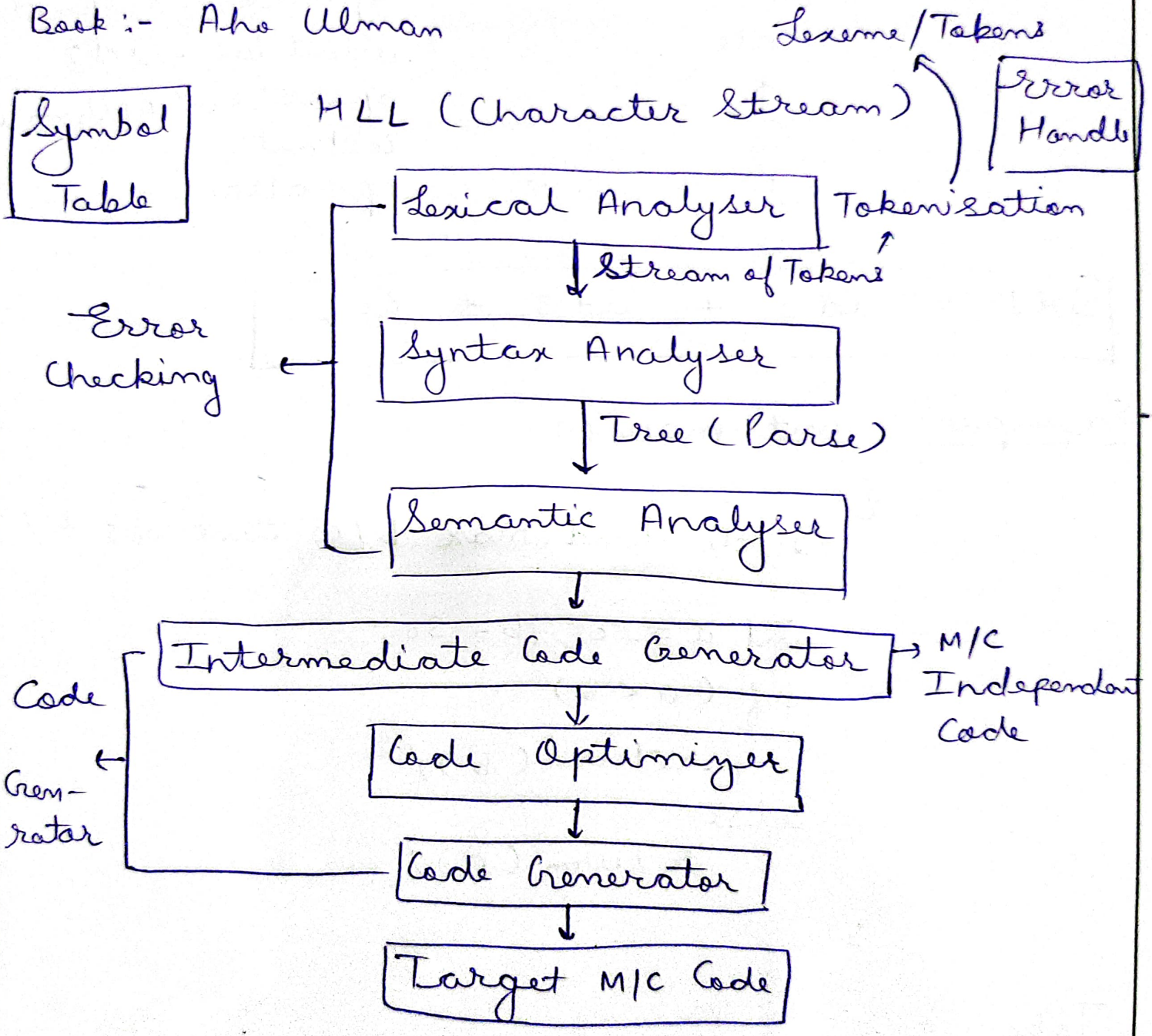
POORNIMA

Date	Unit No.	Lecture No.	Faculty	Subject Name	Subject Code	Main Topics:-

22/8/24 CD

Compiler Design

Book :- Aho Ullman



Main Ideas, Questions & Summary:

Library / Website Ref.:-

position = intial + rate * 60;

Lexeme	Tokens
position	identifier – id 1
=	operator (Assignment
initial	identifier – id 2
+	operator (Arthmatic
rate	identifier – id 3
*	operator (Arthmatic
60	costant
;	operater

id1 = id 2 + id 3 * 60;

Example:

```
int main()
{
  /* to find max b/w two nos */
   int a = 20, b = 30;
   if (a < b)
      return (b);
   else
      return (a);
}
```

Tokens = 32

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Tokens :- a sequence of characters that can be treated as a in the grammar of programming language.

Lexeme :- a sequence of characters in source program that matches the pattern for token and the identifiers lexical analyser as an instance of that token.

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Types of Compiler :-

1. Single - Pass Compiler
2. Multipass Compiler
3. Just - In Time Compiler
4. Ahead - In Compiler

(i) **Single - Pass Compiler :-** process source code in single pass from start to finish.

(ii) **Multiple - Pass Compiler :-** it takes multiple passes over the source code, analyzing it at different stages.

(iii) **Just - In Time Compiler :-** it translates code in ML while program is running

ex :- used in Javascript to improve performance by converting the code as needed.

(iv) **Ahead Time :-** translates code in ML before program is done.

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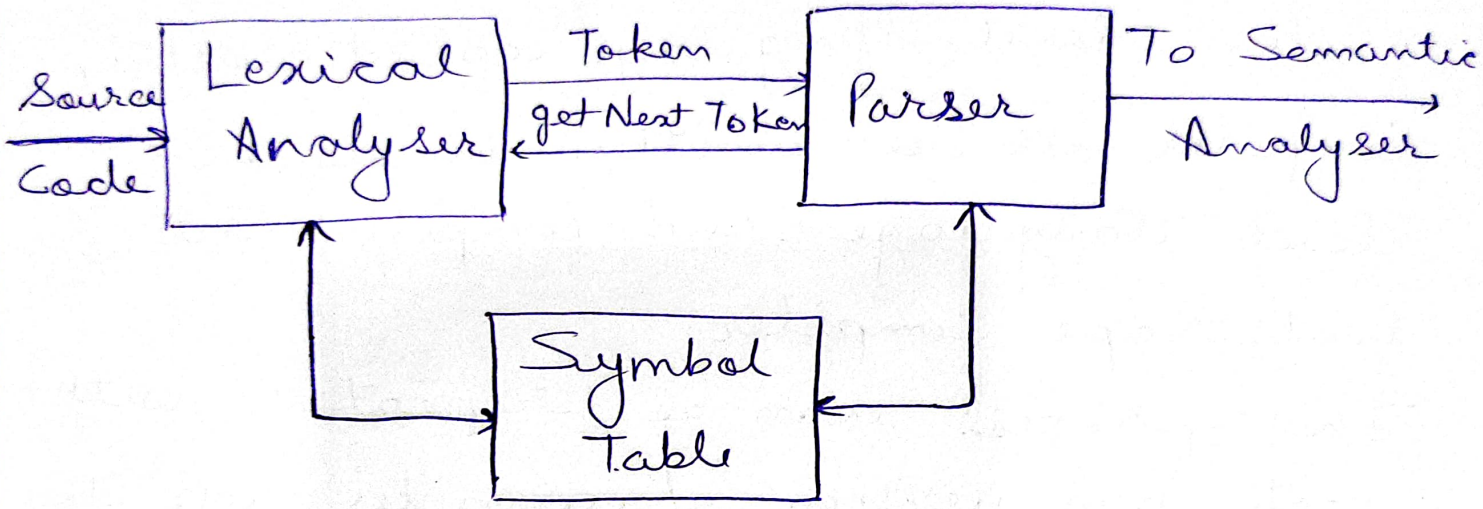
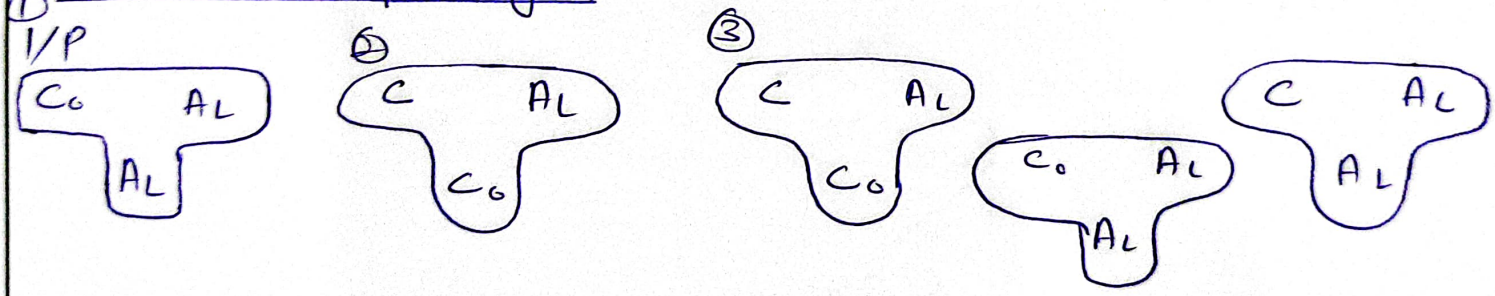
Lexical Analyser



Bootstrapping :-



1. Initially compilers were written in assembly language or low level language specific to hardware
2. As programming language evolved the need for writting compilers in a higher

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level language became evident.

3. Bootstrapping was introduced as solution to this.

Concept of Bootstrapping :-

1. A simple compiler is first written in a low level language called Bootstrap.
2. Compiler is re-written in its own level language and compiled using bootstrape compiler.
3. This process can be repeated with each new version of compiler use to compile its new version.

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position = initial + rate * 60

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Lexical Analyser

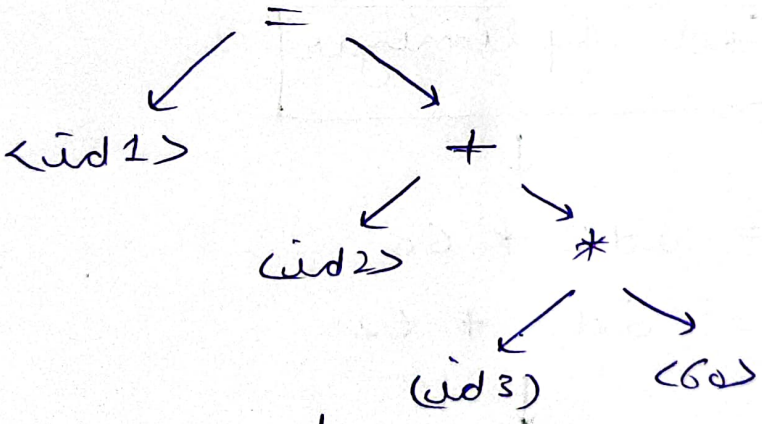
↓

<id 1> <=> <id 2> <+> <id 3> <*> <60>

↓

Syntax Analyser

↓



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Semantic Analyser

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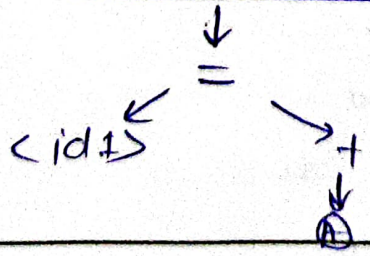

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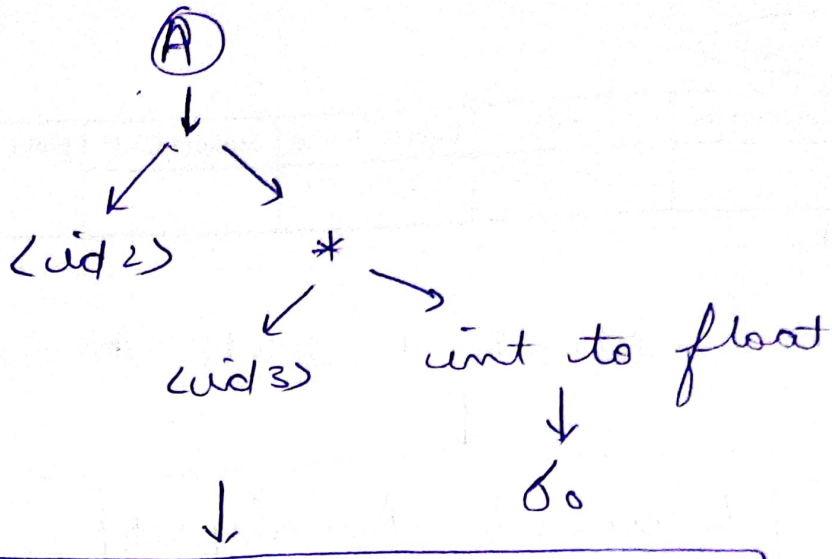

Intermediate Code Generator

$t1 = int\ to\ float\ (60)$

$t2 = id\ 3 * t1$

$t3 = id\ 2 + t2$

$t4 = t3$

Code Optimizer

$t1 = id\ 3 * 60$

$id2 = id\ 2 + t2$

Code Generator

```
LDF   R2, id 3
MULF  R2, R2, #60.0
LDF   R1, id 2
ADDF  R1, R1, R2
STF   id 2, R1
```

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Symbol Table :-

Position	
initial	
rate	

★ YACC- Yet Another Compiler Compiler

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