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# System Software
# CAT-204

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# Syllabus

## UNIT-I

**Introduction to System Software:** Machine Structure, evolution of operating system, machine language.

**Assembler:** Elements of Assembly Language Programming, General design procedure, design of a Two Pass Assemblers, A Single Pass Assemblers Design.

**Table Processing:** Searching & Sorting.

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# Syllabus

## UNIT-II

**Macro and Macro Processors:** Macro instructions, Features of a macro Facility: macro Instruction arguments, Conditional macro expansion, Macro calls within macros, Macro instruction defining macros, Advanced Macro Facilities, Implementation of simple macro processor, Two-pass algorithm, Implementation of macro calls within macros, Implementation within an assembler.

**Linkers** – Translated linked and load time addresses, relocation and linking concepts, Design of a linker, self relocating programs.

# Syllabus

## UNIT-III

Loaders: Loader scheme, absolute loaders, Subroutine linkages, Relocating loaders, Direct linking loaders, binders, linking loaders, overlays, Dynamic Binders, Design of an Absolute Loader, Design of a Direct-Linking Loader. Compilers: Phases of Compiler Construction, Symbol Table, Top-down and bottom-up Parsing, Operator-Precedence Parsing, LR Parsers, Code Generation and Code Optimization, Memory management, Design & other issues.

# Meaning of Assembler

•A language processor that converts an assembly language program into machine language.

•It performs analysis & analysis of source code.

# Design Specification of Assembler

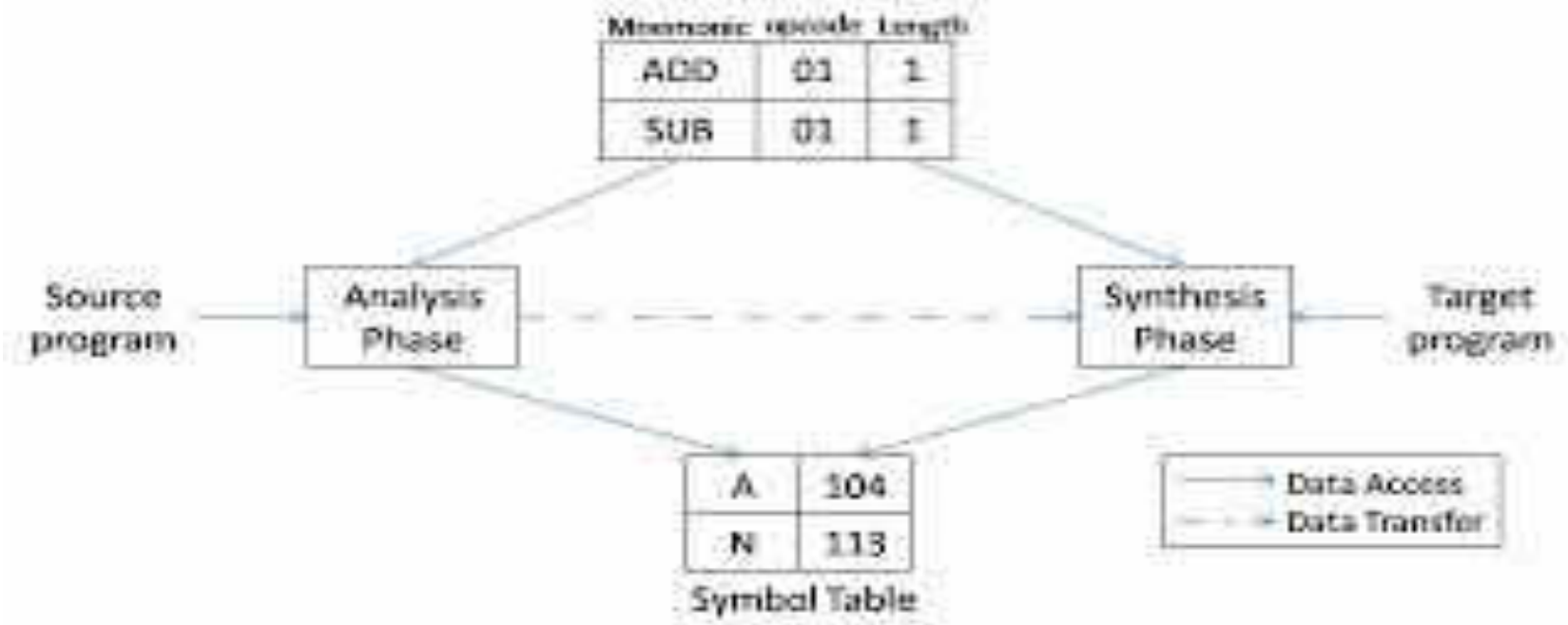
- Identify information for performing task
- Identify data structure for recording information
- Determine processing for obtaining and maintaining information
- Determine processing for performing task.

# Phases of Assembly

- Synthesis Phase

- Analysis Phase

# Phases of Assembly



# 1. Analysis Phase

- Separate content of label, mnemonic opcode and operand of statement
- If symbol, enter (symbol, <LC>) in symbol table
- Check validity in mnemonic table
- Perform LC processing – update address in LC by considering opcode and operand of statement

# 2. Synthesis Phase

- Obtain machine code corresponding to mnemonic
- Obtain address of memory operand from Symbol Table
- Synthesize machine instruction or correct representation of constant.

# Data structures used by an Assembler

- Symbol Table (SYMTAB)
- Literal Table (LITTAB)
- Mnemonic Table or Mnemonic Operation Table (MOT)
- Pseudo-Opcode Table (POT) or Operation Code Table (OPTAB)
- Location Counter (LC)
- Pool Table (POOLTAB)

# References

**BOOKS:-**


•System Programming, Dhamdhare, Chapter 3.

•https://www.youtube.com/watch?v=VG9VopzV_T0

• http://whatis.techtarget.com/definition/system-software

• http://searchdatacenter.techtarget.com/definition/assembler

•http://www.icse.s5.com/notes/m2.html

# Queries???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# Thank You