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System Software
CAT-204

Design By:

Prof. Pawandeep Sharma

A.P

Chandigarh University-Gharuan

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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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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.

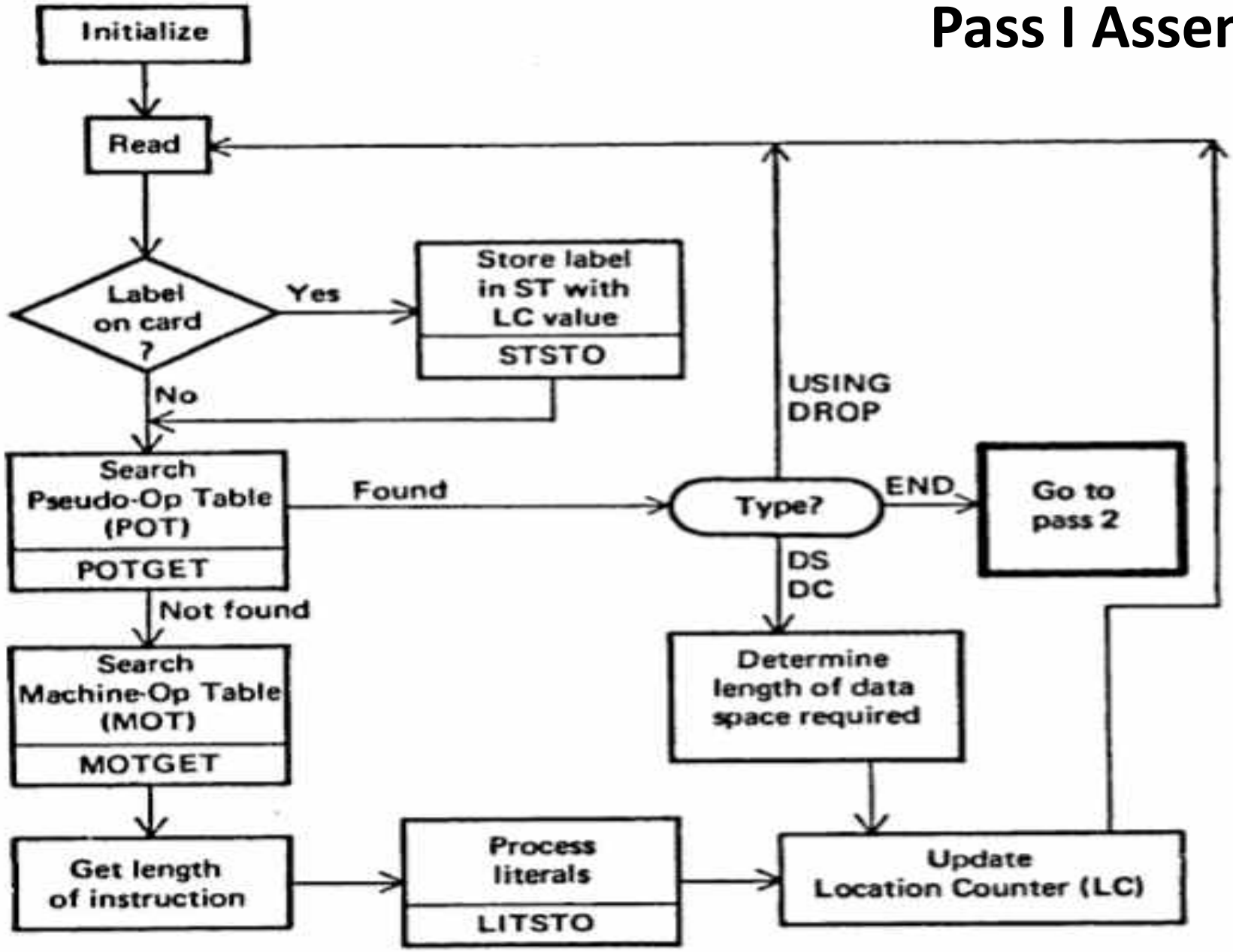
Pass 1 Assembler

Purpose

Pass 1: Purpose – define symbols and literals

1. Determine length of machine instructions (MOTGET1)
2. Keep track of Location Counter (LC)
3. Remember values of symbols until pass 2 (STSTO)
4. Process some pseudo ops, e.g., EQU, DS (POTGET1)
5. Remember literals (LITSTO)

Pass I Assembler



The Databases used in Pass 1

- Input source program
- A Location Counter-To keep track of each instruction's location
- Machine Operation Table (MOT) – symbolic mnemonic and length of each instruction
- Pseudo Operation Table (POT) – mnemonic and action to be taken for each pseudo op in pass 1
- Symbol Table (ST) – stores labels and value
- Literal Table (LT) – stores literals and assigned location
- Copy of Input to be used by pass 2

The Data structures used in Pass 1

- OPTAB – A table of mnemonic opcodes and related information
- SYMTAB – Symbol table
- LITTAB – Table of literals
- POOLTAB – Table of information concerning literal pools

The methods used in Pass 1

- MOTGET - Get contents from MOT
- POTGET - Get contents from POT
- LITSTO – Add contents to Literal table storage
- STSTO - Add contents to symbol table storage

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