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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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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.

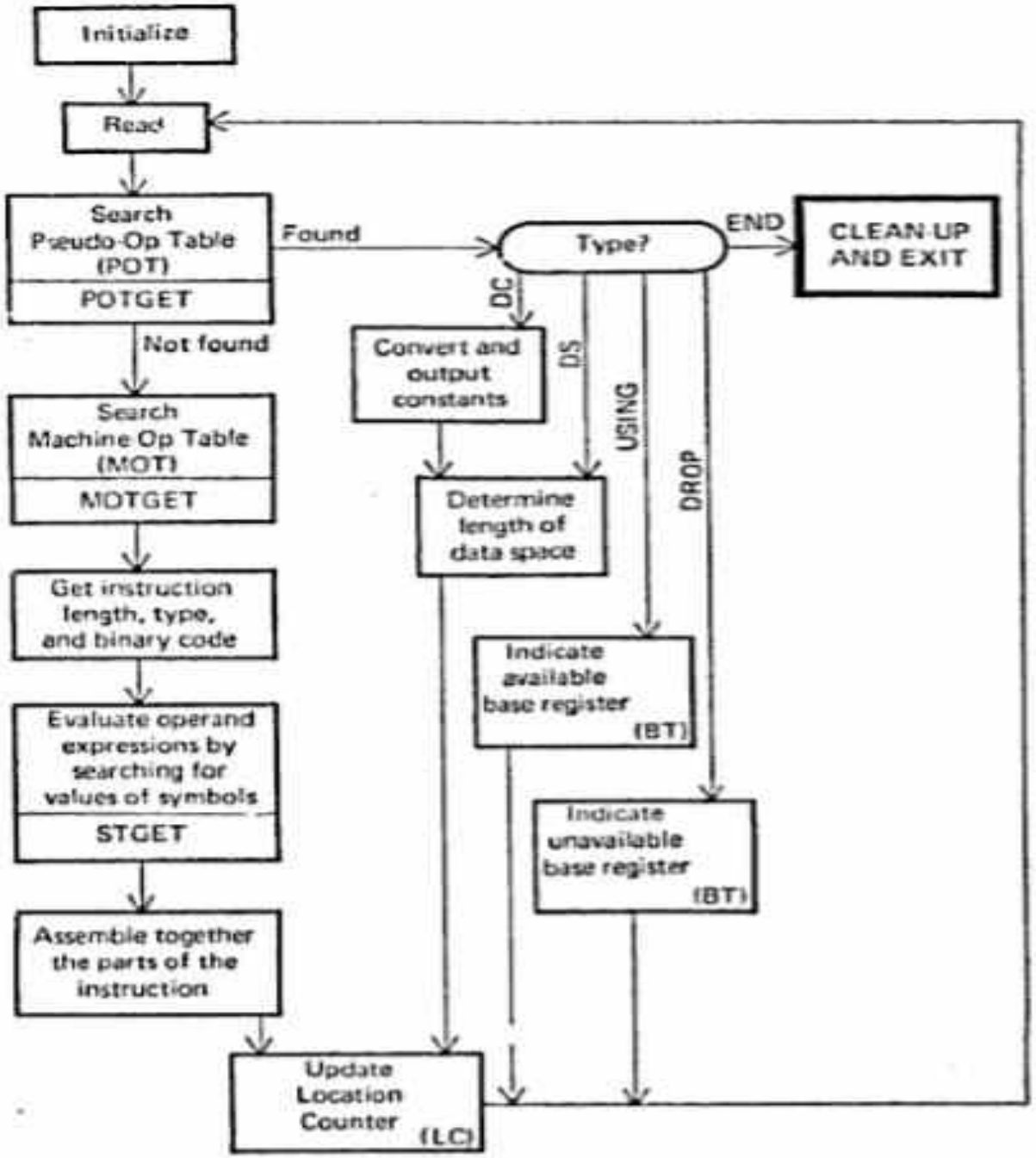
Pass II Assembler

Purpose

Pass 2: Purpose – generate object program

1. Look up value of symbols (STGET)
2. Generate instructions (MOTGET2)
3. Generate data (for DS, DC, and literals)
4. Process pseudo ops (POTGET2)

Pass II Assembler



The Databases used in Pass II

- Input source program obtained from pass I
- 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 2
- Symbol Table (ST) – obtained from pass I
- Literal Table (LT) – Obtained from pass I
- The Base Table (BT) that indicates which registers are currently specified as base registers.

The Data structures used in Pass 2

- 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 2

- MOTGET - Get contents from MOT
- POTGET - Get contents from POT
- STGET - Get contents from symbol table

References

BOOKS:-

•System Programming, Donovan, Chapter 3.

•System Programming and Operating System ,Dhamdhre

•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