Date :

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Subject : System Programming and operating Systems

Topic : Assignment 2. (Theory)

Date :

Questions:

a. Explain expansion time variables and expansion time loop.

b. Explain data structures used in two pass macro processor.

Answers:

a.

1. Expansion time variables (EV):

- These variables are used only during expansion of macro calls. Expansion time variables are local or global. Local EV is created for use only during a particular macro call.
- Syntax: LCL <EV specifications> [, EV spec>...]
  GBL <EV specifications> [, EV spec>...]

<EV spec1> has the syntax of <EV name> but <EV name> is an ordinary string.

SET statement is used to manipulate value of EV.

<EV speci> SET <SET expression>

where <EV spec> is in label field.

SET is in mnemonic field.

2. Expansion Time Loops:

- It can be written using expansion time variables & expansion time control transfer stmt AIF & AGO

eg:

```
MACRO
CLEAR   &A
MOVER   AREG = '0'
```

Date :

```
MOVEM   AREG, &A
MOVEM   AREG, &A+1
MOVE M  AREG, &A+2
MEND
```

where clear B is called, the MOVER statements puts value '0' in AREG. The remaining 3 MOVEM statement store this value in 3 consecutive byte with the addresses B, B+1, B+2.

b.

The following data structures used in two pass ~~assembler~~ macro processor :

i. MDT & MNT are created by Pass 1.

- MDT - Macro definition table. It is to perform macro expansion.
- MNT - Macro Name table.
  It is for reggnizing macro name.

ii. MDTP - Macro definition table pointer.
- Used to indicate next line of text to be used during macro expansion.

iii. ALA - Argument list array.
- Used to substitute macro call arguements for index markers in stored macro definitions.