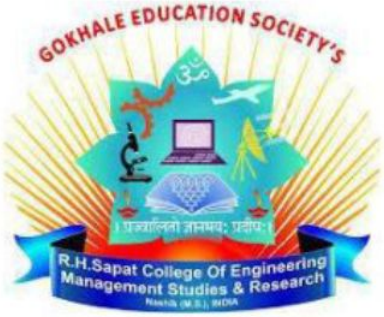

Gokhale Education Society's
R. H. Sapat College of Engineering, Management Studies & Research, Nashik-422005
Department of Computer Engineering

Class: TE B Computer	**Name of Subject: SPOS (310251)**
Semester: VI	**Subject Teacher: Mr. R.R.Chakre**

Group No: 02

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Problem Statement :

Give all the data structures of macro assembler for any assembly program.

(MNT, MDT, PNTAB, EVNTAB, SSNTAB, KPDTAB, SSTAB, APTAB, EVTAB).

Data Structure of macro:

1.Macro Name Table (MNT):- Fields Name of macro, #PP(Number of positional parameters), #KP (Number of keyword parameters), MDTP (Macro Definition Table Pointer), KPDTP (Keywords Parameters Default Table Position).

2. Parameter Name Table (PNTAB):- Fields parameter name.

3. Keywords Parameters Default Table (KPDTAB):- Fields-parameter name, default value.

4. Macro Definition Table (MDT):- Model statements are stored in intermediate code form as: Opcode and operands.

5. EV Name Table(EVNTAB):- Fields EV Name

6. SS Name Table (SSNTAB):- Fields SS Name

7. A Sequencing Symbol Table (SSTAB):

- Each entry in the table is a pair
(<sequencing symbol name>,<MDT entry# >)

8. Actual Parameter Table (APTAB): APTAB is designed to hold the values of formal parameters during expansion of macro call.
Each entry in the table is a pair
(<formal parameter name>,<value >)

9. Expansion Time Variables Table(EVTAB) :

- Each entry in the table is a pair
(<EV name>,<value >)

The value field of a pair is accessed when a pre-processor statement or model statement under expansion refers to an EV.

SPOS PBL

Ujjwal Arvind Lale
TE B 06
7150694280

Problem statement

Give all data structure of macro assembler for any assembly program (MNT) MDT PNTAB EVNTAB

Example :

```
      MACRO
      CLEAR   &M &N &REG=AREG
      LCL     &V
&V    SET     0
      MOVER   &REG = '0'
.MORE MOVEM   &REG &M+&V
&V    SET     &V+1
      AIF     (&V NE&N) .MORE
      MEND
```

	PNTAB		EVNTAB		SSNTAB
1	M	1	V	1	MORE
2	N				
3	REG				

MNT

NAME	#PP	#KP	#EV	MDTP	KPDTP	SSTP
CLEAR	2	1	1	1	1	1

MDT

1		LCL	(E,1)
2	(E,1)	SET	0
3		MOVER	(P,3). ='0'
4		MOVEM	(P,3). (P,1)+(E,1)
5	(E,1)	SET	(E,1)+1
6		AIF	((E,1) NE (P,2)) (S,1)
		MEND	

	KPDTAB			SSTAB	
	REG	AREG			
1			1	4	
2					

Lawand Vrushali N.
TEB07
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Problem statement :-
Give all data structures of macro assembler for any assembly program.
(MNT, MDT, PNTAB, EVNTAB, SSNTAB, KPDTAB, SSTAB, APTAB, EVTAB).

Example :-

```
        MACRO
        CLEARMEM  &X, &N, &REG=AREG .
        LCL       &M
&M      SET       0
        MOVER     &REG, ='0'
.MORE   MOVEM     &REG, &X+&M
&M      SET       &M+1
        AIF       (&M NE N).MORE
        MEND
```

macro call : CLEARMEM AREA, 10

- PNTAB

PNTAB_Ptr	Parameter Name
1	X
2	N
3	REG

- EVNTAB

EV Name
M

- SSNTAB

SSNTAB_Ptr	SSName
1	MORE

- MNT

Name	#PP	#KP	#EV	MDTP	EPDTP	SSTP
CLEARMEM	2	1	1	25	10	5

- KPDTAB

KPDTAB_Ptr	Parameter Name	Default value
10	REG	AREG

- SSTAB

SSTAB_Ptr	MDT Entry#
5	28

- ~~APTAB~~

- MDT

MDT_Ptr	LABEL	OPCODE	OPERAND
	.	.	.
25		LCL	(E, 1)
26	(E, 1)	SET	0
27		MOVER	(P, 3), = '0'
28		MOVEM	(P,3), (P,1)+(E,1)
29	(E, 1)	SET	(E, 1)+1
30		AIF	((E,1)NE(P,2))(G,1)
31		MEND	
	.	.	.

- APTAB

APTAB_Ptr	Value
1	AREA
2	10
3	AREG

- EVTAB

EVTAB_Ptr	value
1	0

विवेकही· श्छाओं का पोषण करना ससाररूपी विषवृक्ष को सींचने के समान है

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SPOS PBL

Page No.
Date

Problem Statement :-

Give all data structures of macro assembler for any assembly program (MNT, MDT, PNTAB, EVNTAB, SSNTAB, KPDTAB, SSTAB, APTAB, EVTAB)

Example :-

Write a macro to increment the value stored in memory word.

Macro definition

Prototype statement syntax :

<name_of_macro> [<formal parameter spec> [,...]]

& <name_of_parameter> [<parameter_type>]

Macro header →	MACRO			
	INCR	&MEM_VAL, &INC_VAL, &REG		← Prototype statement
	MOVER	&REG	&MEM_VAL	
	ADD	&REG	&INC_VAL	
Macro end →	MOVEM	&REG	&MEM_VAL	
	MEND			

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SPOS PBL

Problem statement -
Give all data structures of macro cussembler for any assembly program. (MNT, MDT, PNTAB, EUNTAB, SSNTAB, KPDTAB, SSTAB, APTAB, EUTAB)

Example -

```
MACRO
BECEG    &X, &Y, &REG=BREG
AIF      (&Y EQ 0) .EXIT
MOVER    &REG, &X
MUL      &REG, &Y
.EXIT MEND
```

PNTAB

X
Y
REG

EUNTAB

-

SSNTAB

EXIT

MNT

	#PP	#KP	#EV	MDTP	KPDTP	SSTP
BECEG	2	1	0	35	20	6

KPDTAB

20	REG	BREG

SSTAB

6	35

MDT

35	AIF (P,2) EQ 0 .(S,1)
36	MOVER (P,3), (P,1)
37	MUL (P,3) (P,2)
38	(S,1) MEND
39	
40	
41	

SPOSL PBL

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2] **Problem statement** → Give all data structures of Macro assembler for any assembly program. (MNT, MDT, PNTAB, EVNTAB, SSNTAB, KPDTAB, SSTAB, APTAB, EVTAB).

[Assembly Program] :-

```
MACRO
CLEARMEM &T, &N & REG = AREA.
LCL & M.
&M SET 0.
MOVER &REG = '0'
MORE MOVEM &REG , &X + &M
&M SET &M+1
    ATF (&M MEN) MORE
MEND
CLEARMEM AREA, 10.
```

1]

PNTAB
X
N
REG

2] EVN TAB

M

3] SS TAB

MORE

4] MNT :-

CLEARMEM	
#PP	2
#KP	1
#EV	1
MDTP	25
KPDT	10
SSTAB	5

5] KPD TAB -:

10	REG	AREG

6] SS TAB -:

5.27

7] MDT -:

25	(E, 1) SETO.
26	MOVER (K, 1) = '0'
27	MOVEM (K, 1)(P, 1) + (P+1) (S, 1)
28	(E, 1) SET (E, 1)+1
29	AIf (E, 1) NE (P, 1) (S, 1)
30	MEND

8]

APTAB
AREG
AREA
10