Assignment No. 2
Design suitable data structures & implement FIRST pass of a two-pass Macro processor.

- Input
  - Assembly language program with
    - Simple macro
    - Macro with parameters
    - Nested macro (macro call within macro definition)
    - Macro definition n calls
- Output
  - 1. MNT (Macro Name Table)
  - 2. MDT (Macro Defination Table)(with expansion of nested macro call - follow early expansion)
  - 3. Formal Vs Positional Parameters List
  - 4. Actual Vs Positional Parameters List (for nested macro calls)
  - 5. Intermediate Code

Data Structures – Pass1

- Input source file
- Intermediate file
- MNT
- MDT
- MNT pointer - MNTP
- MDT pointer - MDTP
- Line counter
- Argument list array (ALA)

Sample Program

```
LOAD A
STORE B
MACRO ABC
      LOAD p
      SUB q
MEND
MACRO ADD1 ARG
       LOAD X
       STORE ARG
MEND
MACRO ADD5 A1, A2, A3
      STORE  A2
       ADD1 5
       ADD1 10
       LOAD A1
       LOAD A3
MEND
ABC
ADD5 D1, D2, D3
END
```

Sample Output

```
LOAD A
STORE B
MACRO ABC
      LOAD p
      SUB q
MEND
MACRO ADD1 ARG
       LOAD X
       STORE ARG
MEND
MACRO ADD5 A1, A2, A3
      STORE  A2
       ADD1 5
       ADD1 10
       LOAD A1
       LOAD A3
MEND
ABC
ADD5 D1, D2, D3
END
```

Intermediate Code

```
LOAD A
STORE B
ABC
ADD5 D1, D2, D3
END
```

MNT		
Name of macro	No. of parameters	Starting Index
ABC	0	1
ADD1	1	4
ADD5	3	7

Sample Output

```
LOAD A
STORE B
MACRO ABC
      LOAD p
      SUB q
MEND
MACRO ADD1 ARG
       LOAD X
       STORE ARG
MEND
MACRO ADD5 A1, A2, A3
      STORE  A2
       ADD1 5
       ADD1 10
       LOAD A1
       LOAD A3
MEND
ABC
ADD5 D1, D2, D3
END
```

	MDT
1	LOAD p
2	SUB q
3	MEND
4	LOAD X
5	STORE #1
6	MEND
7	STORE #2
8	LOAD X
9	STORE 5
10	LOAD X
11	STORE 10
12	LOAD #1
13	LOAD #3
14	MEND

Formal v/s positional parameter list and Actual v/s positional parameter list (ALA)

ADD1	
Formal parameter	Positional parameter
ARG	#1

ADD5	
Formal parameter	Positional parameter
A1	#1
A2	#2
A3	#3

ADD1	
Actual parameter	Positional parameter
5	#1
Actual parameter	Positional parameter
10	#1

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Thank You!!