MIT School of Engineering

Department of Computer Science and Engineering

Subject: System Programming and Operating System Lab

A.Y. 2022-23

Class: CSE CORE-3
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Title : Design suitable data structures and implement macro definition and macro expansion processing for a sample macro with positional and keywords parameters.

Pre-requisites:

To understand macro facility, features and its use in assembly language programming.

Introduction:

Macro are used to provide a program generation facility through macro expansion. Many programming language provide built in facilities for writing macros.
E.g. Ada,C and C++. Higher version of processor family also provide such facility. “A macro is a unit of specification for program generation through expansion. Macro consist of name, a set of formal parameters and a body of code. “The use of macro name with a set of actual parameters is replaced by some code generated from its body, this is called macro expansion.”

Algorithm/ Flowchart:

MIT School of Engineering

Department of Computer Science and Engineering

Subject: System Programming and Operating System Lab

A.Y. 2022-23

```
procedure EXPAND
    begin
        EXPANDING  := TRUE
        get first line of macro definition (prototype) from DEFTAB
        set up arguments from macro invocation in ARGTAB
        write macro invocation to expanded file as a comment
        while not end of macro definition do
            begin
                GETLINE
                PROCESSLINE
            end {while}
        EXPANDING := FALSE
    end {EXPAND}
```

Code:

```
#include<stdio.h>
#include<string.h>
#include<stdlib.h>

char line[80],t1[10],t2[20],t3[10],FPN[20],APN[20],mname[10];
int count , v1,v2,v3,v4;
FILE *ifp;

int main()
{
  int t21,t31,index=1;
ifp= fopen("int.txt","r");
while(!feof(ifp))
{
fgets(line,179,ifp);
count = sscanf(line,"%s%s%s",t1,t2,t3);
if(strcmp("MACRO",t1)==0)
{
strcpy(mname,t2);
printf("\n macro name table");
printf("\n_____\n");
}
if(strcmp(mname,t2)==0)
{
```

```
strcpy(FPN,t3);
printf("\n\n\n**FORMAL PARAMETER NAME TABLE**");
printf("\n_____________________________________:\n");
printf("\nINDEX\t\t:MACRO NAME");
printf("\n%d\t:%s",index,FPN);
}
if(strcmp(mname,t1)==0)
{
strcpy(APN,t2);
printf("\n\n\n**ACTUAL PARAMETER NAME TABLE**");
printf("\n_____________________:\n");
printf("\nINDEX\t\t:MACRO NAME");
printf("\n%d\t:%s",index,APN);
}
} }
```

Output:

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Department of Computer Science and Engineering

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A.Y. 2022-23

Conclusion: Thus we have successfully designed suitable data structures and implemented macro definition and macro expansion processing for a sample macro with positional and keywords parameters.