

SP Assignment 4

Name: Yash Oswal

Div: B Roll no: 38

SRN: 201901226

Input file:

```
MACRO
CLEARMEM &X, &N, &REG=AREG
MOVER &REG, ='0'
MOVEM &REG, &X + &N
MEND
```

```
MACRO
ADD3NUM &A, &B, &C
ADD &A, &B
MOVEM &A, AREG
ADD &A, &C
MEND
```

```
MACRO
INCR &MEM, &REG2, &INCR=
MOVER &REG2, &MEM
ADD &REG2, &INCR
MOVEM &REG2, &MEM
MEND
```

MNT -

#MACRO	#PP	#KP	#MDTP	#KPDTP
CLEARMEM	2	1	0	0
ADD3NUM	3	0	6	0
INCR	2	1	13	0

MDT -

```
MOVER (P,3) ='0'
MOVEM (P,3) (P,1) + (P,2)
ADD (P,1) (P,2)
MOVEM (P,1) AREG
ADD (P,1) (P,3)
MOVER (P,2) (P,1)
ADD (P,2) (P,3)
MOVEM (P,2) (P,1)
```

PNTAB -

```
&X
&N
&REG
&A
&B
&C
&MEM
&REG2
&INCR
```

KPDTAB -

CODE -

```
0 &REG MACRO
```

```
import re
```

```
def prototype_processing(prototype,MDTP,KPDTP):
    KP = 0
    PP = 0
    i = 0
    pwords = [x.upper() for x in prototype ]
    for i in range(len(pwords)):
        s=1
        if pwords[i].startswith('&') and not pwords[i].__contains__('=') :
            parameter = pwords[i]
            temp[parameter] = list()
            temp[parameter].append(f"(P,{str(i)})")
            PP+=1
            PNTAB.write(f"{str(pwords[i])}\n")

        if pwords[i].startswith('&') and pwords[i].__contains__('='):
            twords = pwords[i].split("=")
            k_parameter = twords[0]
            temp[k_parameter] = list()
            temp[k_parameter].append(f"(P,{str(i)})")
            if len(twords) == 2 and twords[1] != ":":
                KPDTAB.write(f"{str(KPDTP)} {str(twords[0])} {str(twords[1])}")
                KPDTP += KP
                KP += 1
                PNTAB.write(f"{str(twords[0])} \n")
            else:
                KP += 1
                PNTAB.write(f"{str(twords[0])} \n")
    MNT.write(f"{str(prototype[0])}\t{str(PP)}\t{str(KP)} \t{str(MDTP)}\n")
    KPDTP.write(f"{str(KPDTP)}\n")
```

```

def process_MDT(words):
    global MDTP
    for i in words.split():
        if i == 'MACRO' or i == 'MEND':
            continue
        else:
            if i.__contains__('&') and not i.__contains__('='):
                var = i.split(',')
                char = temp[var[0]]
                MDT.write(f"{char[0]} ")
            else:
                MDT.write(f"{i} ")
    MDTP+=1
    MDT.write('\n')

```

```

MDTP = 0 #Macro Definition Table Pointer
KPDTAB = 0 #Keyword Parameter Default Table Pointer

```

```

#Open Maro Input File
macro = open('input.txt','r')

```

```

#Macro Name Table
MNT = open('MNT.txt','a+')
MNT.truncate(0)

```

```

#Macro Definition Table
MDT = open('MDT.txt','a+')
MDT.truncate(0)

```

```

#Keyword Parameter Default Table
KPDTAB = open('KPDTAB.txt','a+')
KPDTAB.truncate(0)

```

```

#Parameter Name Table
PNTAB = open('PNTAB.txt','a+')
PNTAB.truncate(0)

```

```

lines = macro.readlines()

```

```

#Temporary MDT
mdt = []
temp = {}
macroName = []

```

```

i=0
while i < len(lines):
    words = re.split(r'[\s,]+' , lines[i])
    words.pop()

```

```
for j in range(len(words)):
    word = words[j]
    if word == 'MACRO':
        # print(words)
        prototype = re.split(r'[\s,]+', lines[i + 1])
        prototype_processing(prototype, MDTP, KPDTP)
    process_MDT(lines[i])
i += 1
```