



NATIONAL UNIVERSITY OF SCIENCES AND TECHNOLOGY

MILITARY COLLEGE OF SIGNALS

SUBMITTED BY: GROUP #7

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SECTION : 26-C

CMS ID : 336114

SUBJECT : FOP (CS-114)

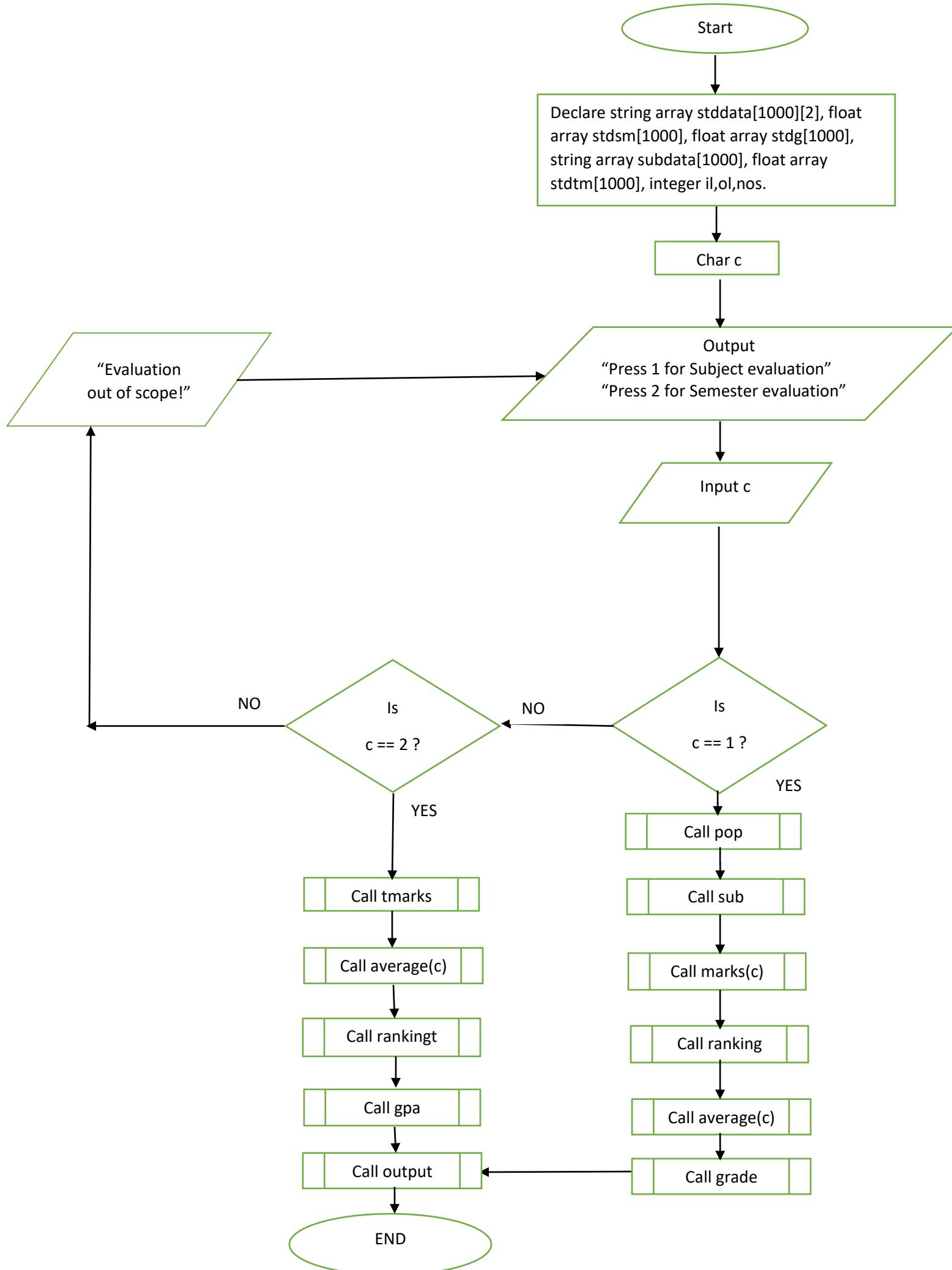
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SUBMITTED ON : 11/FEBRUARY/2021

FUNCTIONAL REQUIREMENTS:

- pop Function --> populates the 2d array with student's id,name
- sub Function --> validates the name of subject
- marks Function-->makes the user make marks of subject input
- ranking Function --> ranks the students depending upon marks takes c as an perimeter to rank semester wise or subject wise respectively.
- average Function -->calculates the average of the class
- grade Function --> subject grade calculation
- output Function --> output grade or gpa depending upon value of c
- tmarks --> add all the marks of student in all subjects and total marks in an array
- gpa Function --> calculates gpa for every student

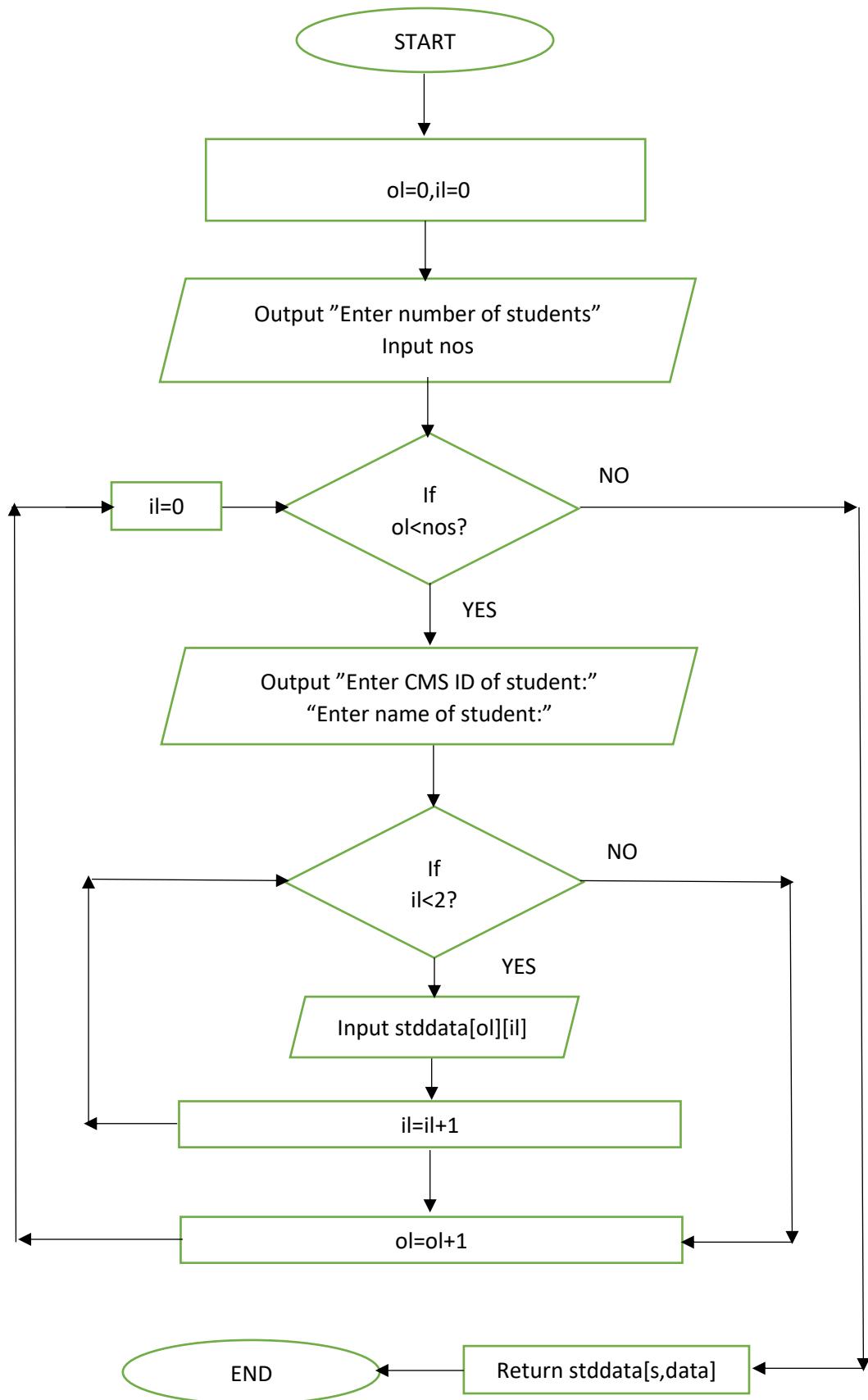
1)MAIN FUNCTION:



1)PSEUDOCODE:

```
Declare string array stddata[1000][2], float array stdsm[1000], float array stdg[1000], float array stdtm[1000], string subdata[1000] integer il,olstd.  
Declare character c  
Output "enter 1 for subject evaluation"  
Output "enter 2 for semester evaluation"  
Input c  
Switch (c)  
    Condition1: c equal to 1 then  
        Call pop function  
        Call sub  
        Call marks(c)  
        Call ranking  
        Call average(c)  
        Call grade  
    End Condition1  
    Condition2: c is not equal to 1 then C is equal to 2  
        Call pop function  
        Call tmarks  
        Call average(c)  
        Call rankingp  
        Call gpa  
        Call output  
    End Condition2  
    No condition is true  
        Output "Evaluation out of scope!"  
        Make the user re-enter the subject code  
    End switch
```

2)pop FUNCTION:

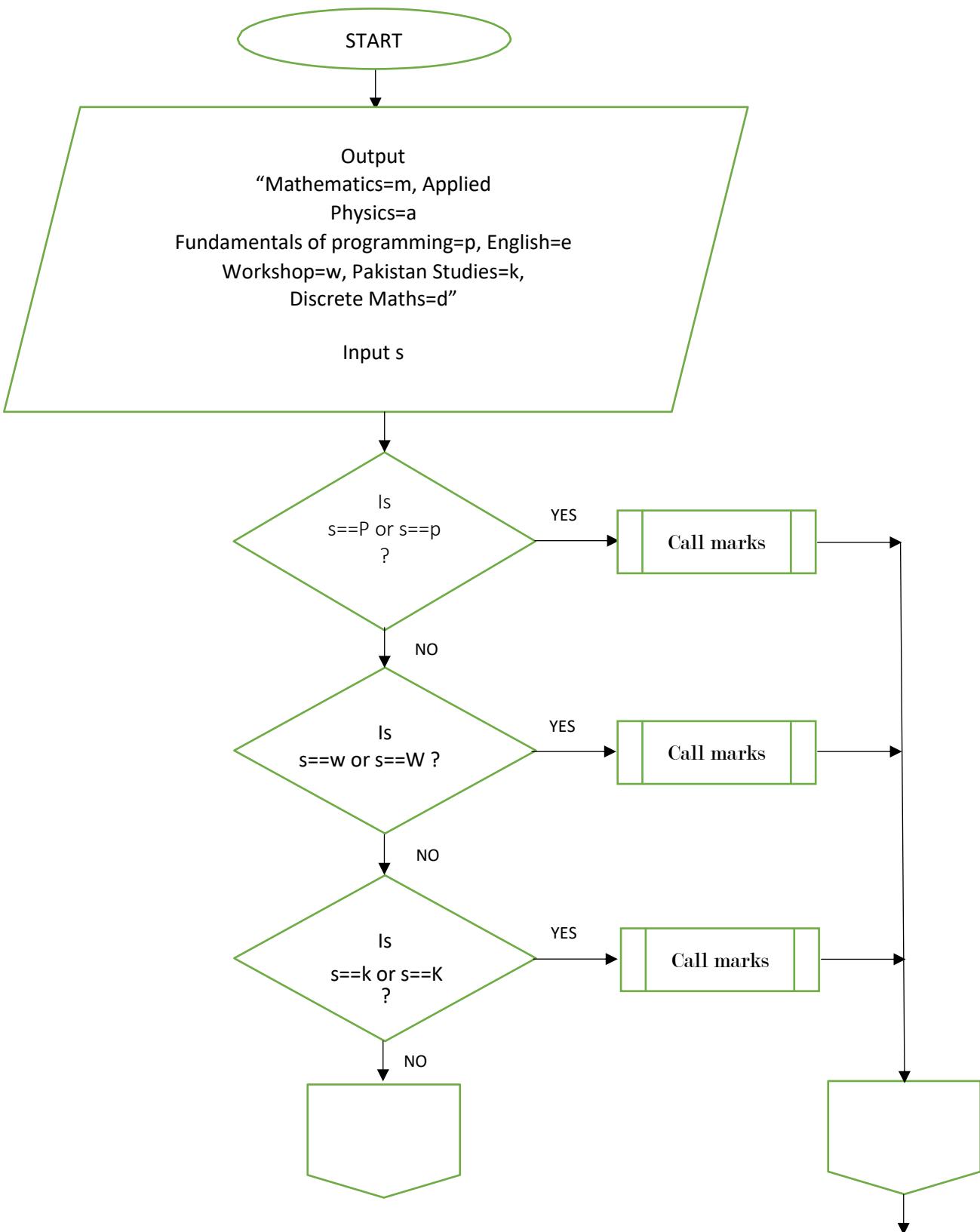


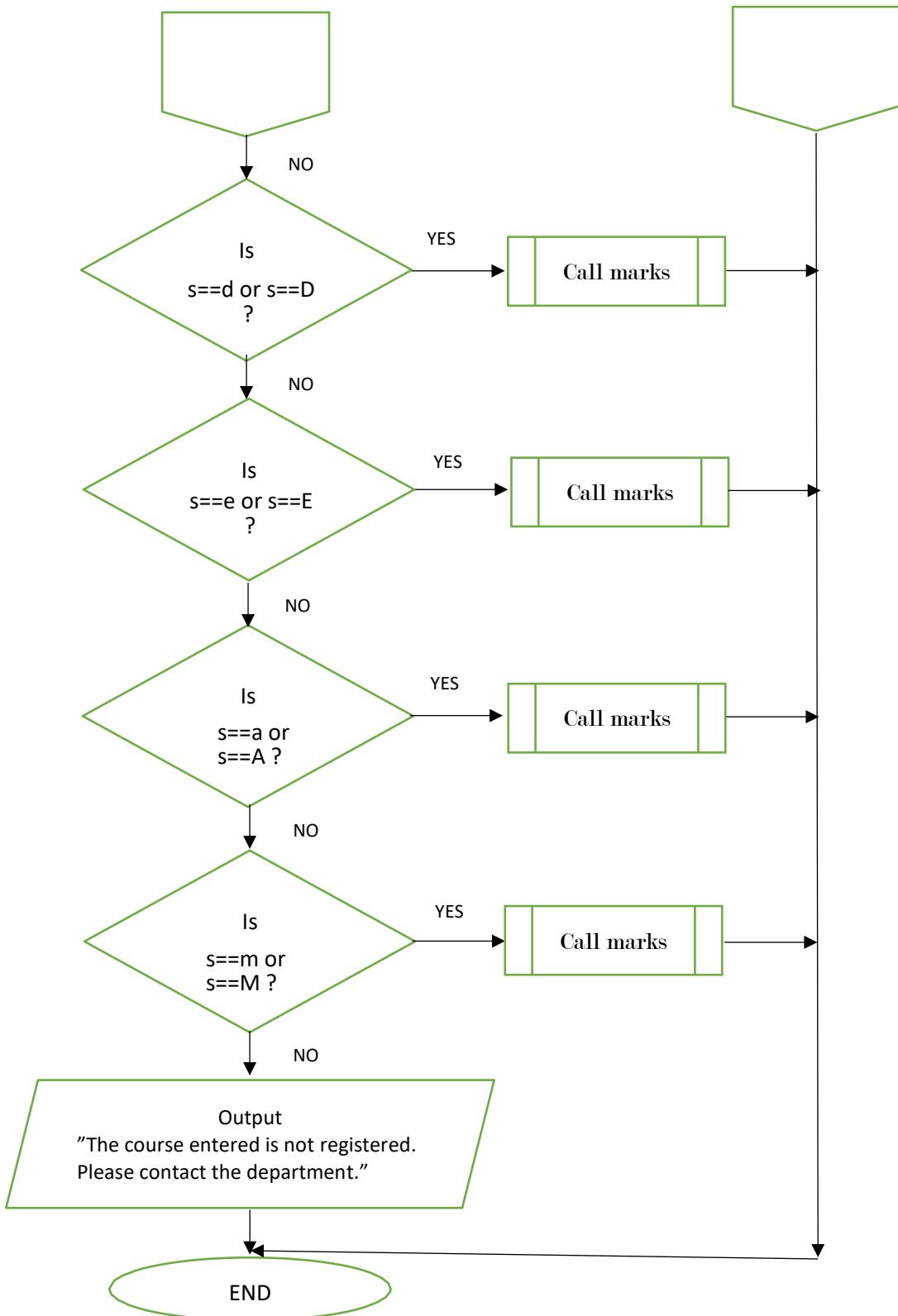
2)Pseudocode:

```
Assignment ol=0, il=0
Output " Enter the number of students"
Input in nos
For ol<nos
    Output "Enter CMS ID of student:" and
    "Enter name of student:"
    Input= stddata[ol,il]
    For ol<nos
        Input= stddata[ol,il]
    End for
End for
```

NOTE: Validation of CMD ID for being a 6 digit entry and no two CMS IDs are not included in flowchart as they are exceptional handling and do not really affect the flow of program.

3)subject FUNCTION:



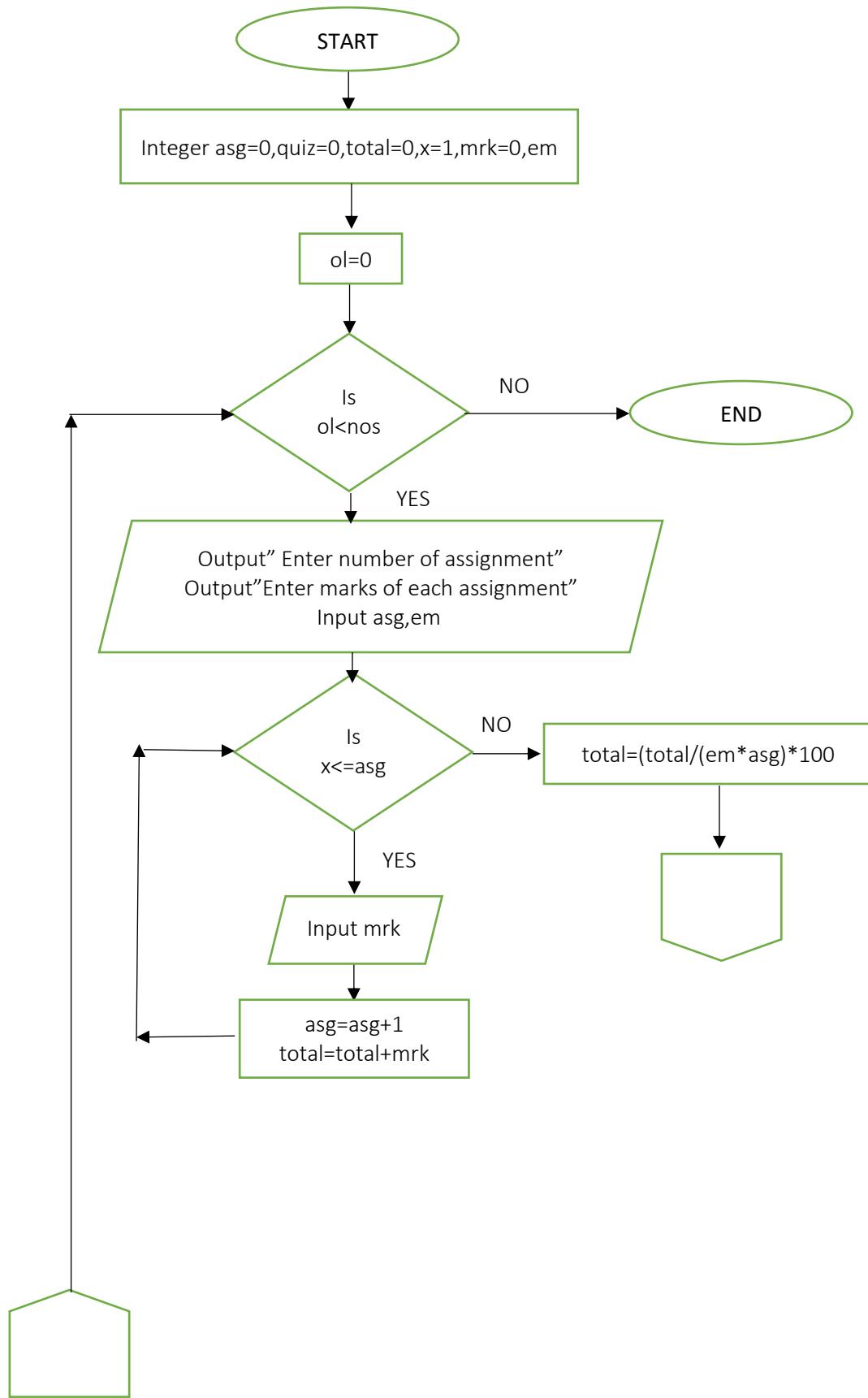


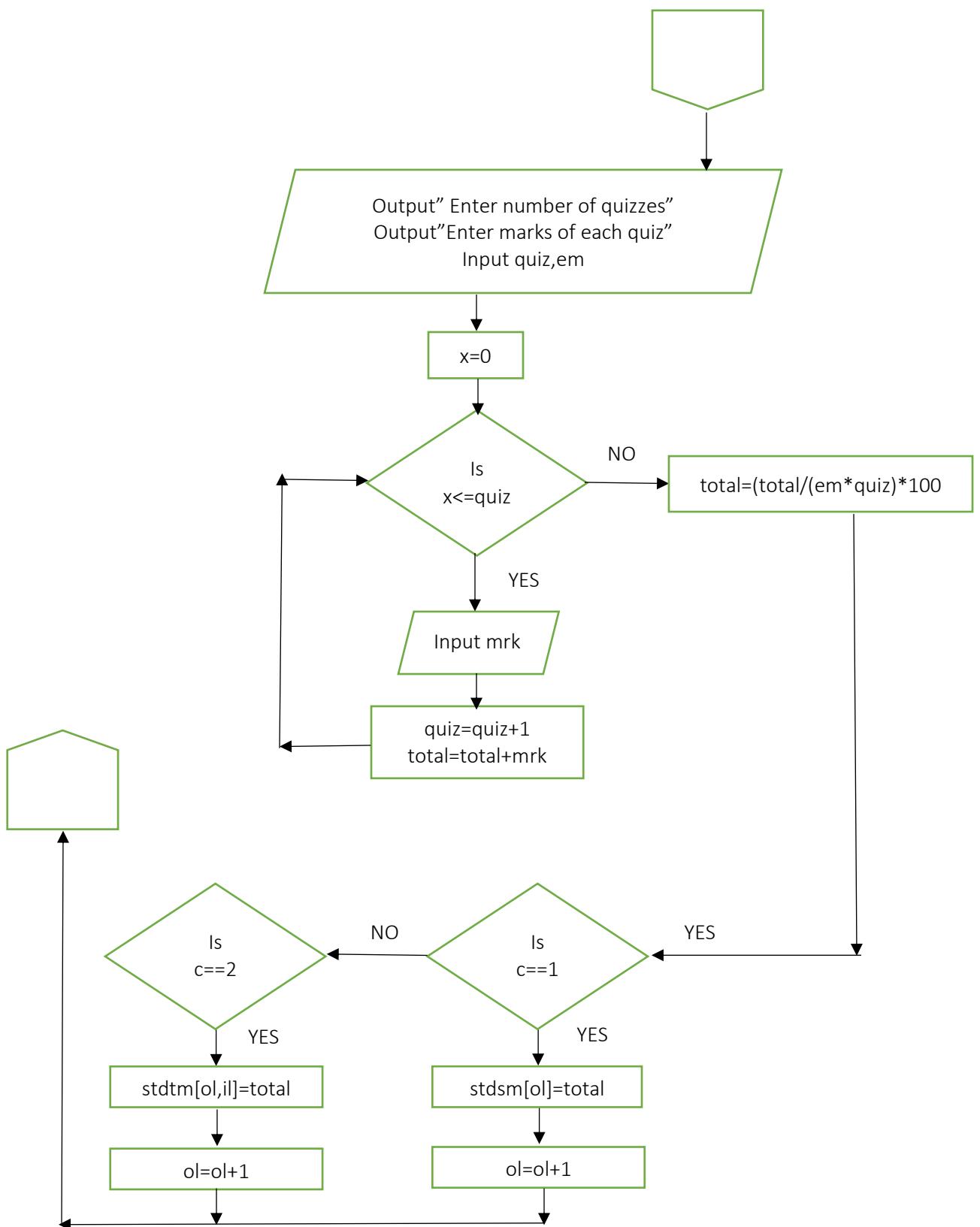
3)Pseudocode:

Output the menu of the subject codes
“Mathematics=m, Applied Physics=a, Fundamentals of programming=p, English=e,
Workshop=w, Pakistan Studies=k ,Discrete Maths=d”
Input s
If s==m then call marks
Else If s==a or s==A then call marks
Else If s==p or s==P then call marks
Else If s==e s==E then call marks
Else If s==w s==W then call marks
Else If s==k s==K then call marks
Else If s==d s==D then call marks
Else output “The course entered is not registered. Please contact the department.”
End if

4)marks FUNCTIONS:

Pass value of c as one of the perimeter .Using case pass by reference. One of the perimeter is il only useful when $c==2$.



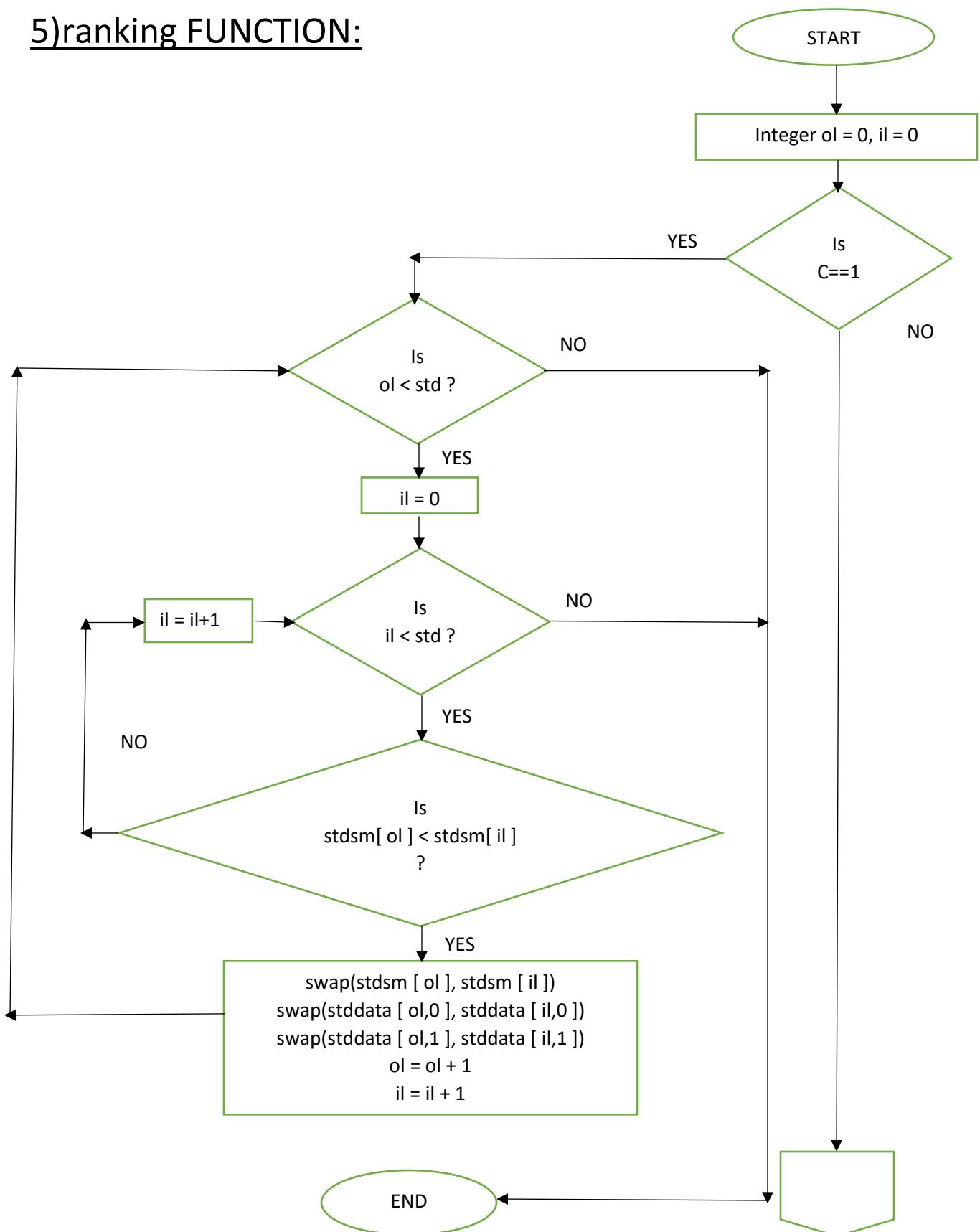


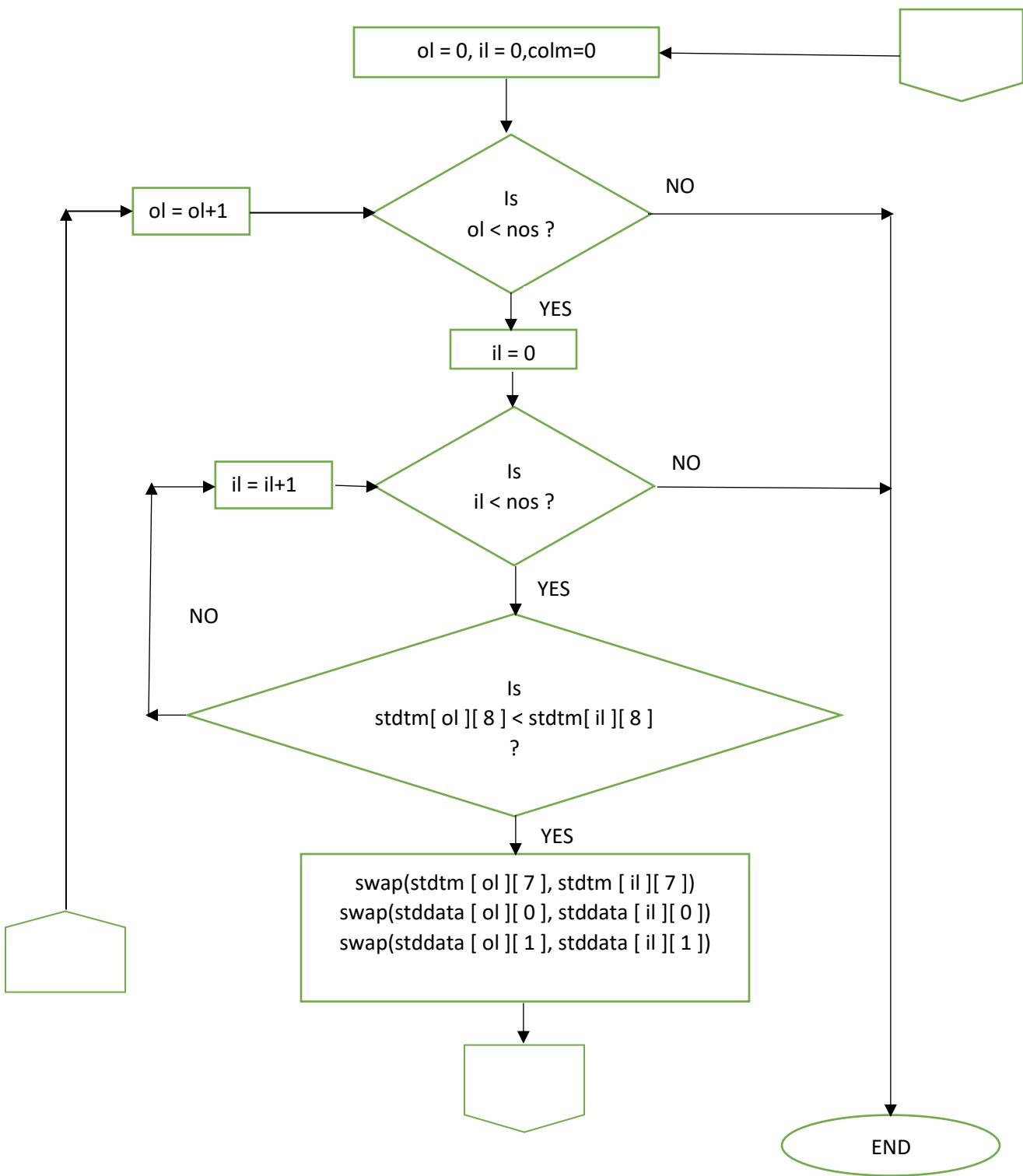
4)Pseudocode:

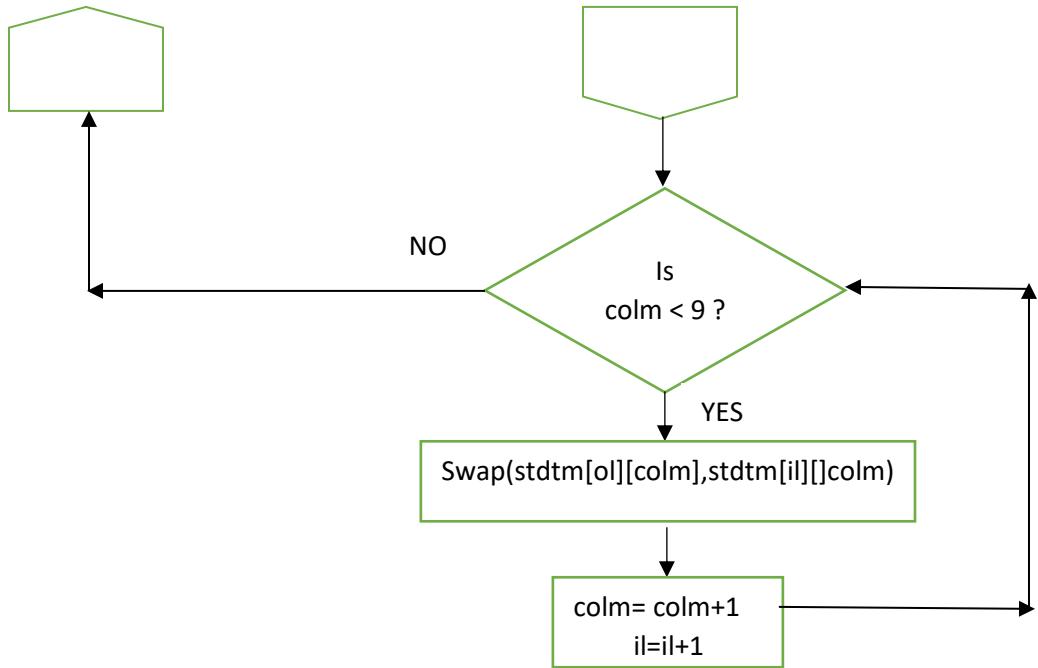
```
Integer asg=0,quiz=0,total=0,x=1,mrk=0,em  
ol=0  
for ol<nos  
Output " Enter number of assignments"  
Input asg  
Output"Enter each assignment marks"  
Input em  
while x<=asg then  
    Input mrk  
    Total = total+mrk  
    x=x+1  
end while  
total=(total/(em*asg)*100  
Output " Enter number of quizzes"  
Input quiz  
Output"Enter each quiz marks"  
Input em  
while x<=quiz then  
    x=0  
    Input mrk  
    Total = total+mrk  
    x=x+1  
end while  
total=(total/(em*quiz)*100  
check for value of c using case  
If c==1  
    input marks it in array stdsm[ol] using PASS BY REFERENCE. (stdsm[ol]=total)  
ol=ol+1  
If c==2  
    input marks it in array stdtm[ol,il] using PASS BY REFERENCE. (stdtm[ol,il]=total)  
ol=ol+1  
end for (ol => nos end the loop.)  
end for
```

NOTE: The validation check is put in MARKS function so that the obtained marks are not greater than total marks in every subject and for each assignment and quiz. This check is not included in flowcharts and pseudocode as it is not defining the flow of program.

5)ranking FUNCTION:





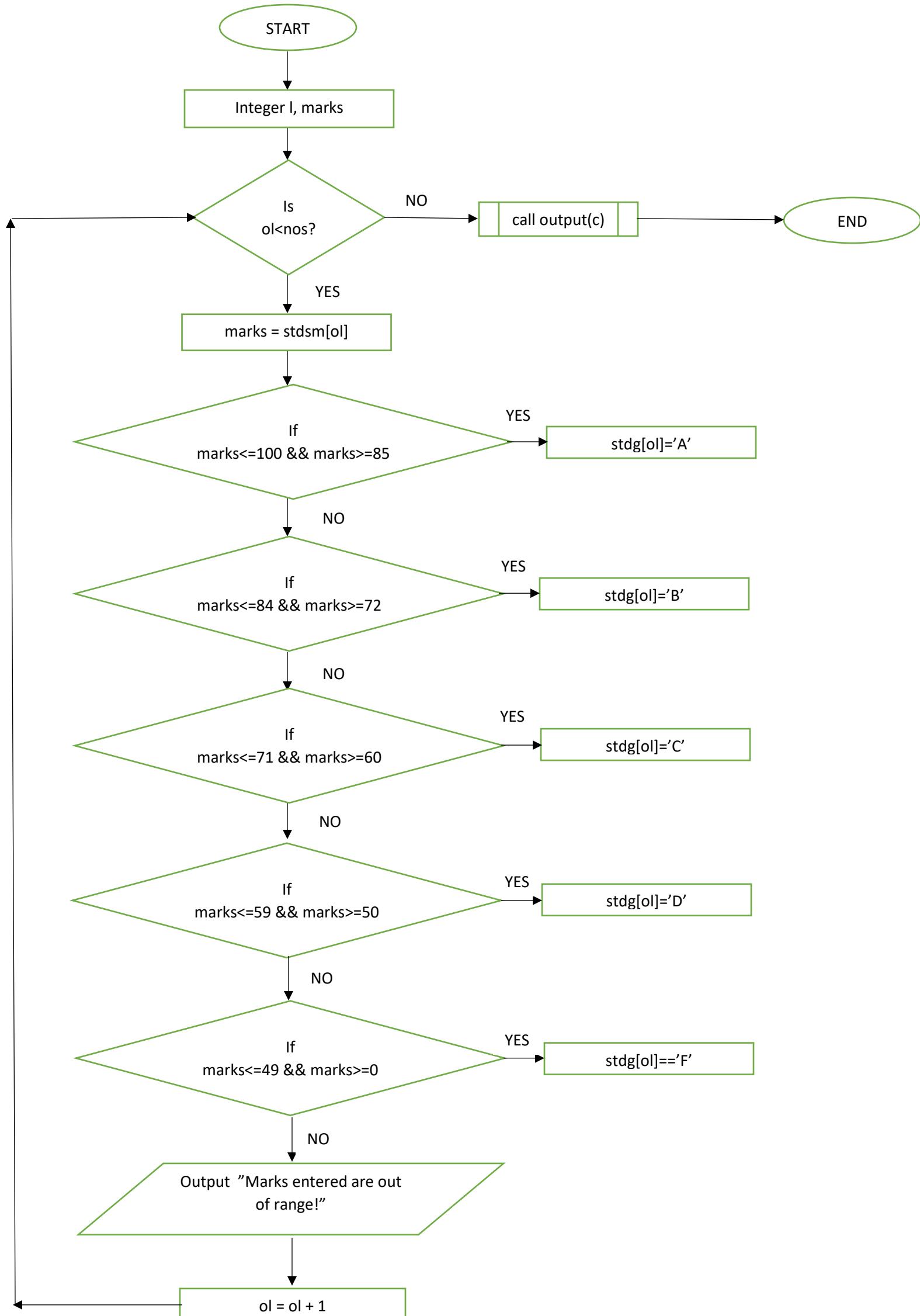


5)PSEUDOCODE:

```
If c==1 then run the below code
int ol = 0, il = 0
for ol is less than std then
    for il is less than std then
        if next stdsm [ ol ] is less than stdsm [ il ]then
            swap(stdsm [ ol ], stdsm [ il ])
            swap(stddata [ ol,0 ], stddata [ il,0 ])
            swap(stddata [ ol,1 ], stddata [ il,1 ])
            ol = ol + 1
            il = il + 1
        end if
        else
            il = il + 1 and jump back to inner loop condition
        else
            endif
    else
        endif
```

```
c cannot be other than 2 (c=2), run the below code
Int ol = 0, il = 0, colm=0
for ol is less than nos then
    il = 0
    for il is less than nos then
        if stdsm[ ol ][ 8 ] is less than stdtm[ il ][ 8 ] then
            call swap(stdtm[ol][8],stdtm[il][8])
            call swap(stddata[ol][0],stddata[il][0])
            call swap(stddata [ ol ][ 1 ], stddata [ il ][ 1 ])
            for(colm<7)
                swap(stdtm[ol][colm],stdtm[il][colm])
                colm=colm+1
                il=il+1
        else
            il = il + 1
        end if
    ol=ol+1
endfor
```

6)grade FUNCTION:



6)PSEUDOCODE:

```
integer l, marks
for ol<nos then
    marks = stdsm[ol]

if marks <= 100 && marks >= 85 then
    stdg[ol]= 'A'

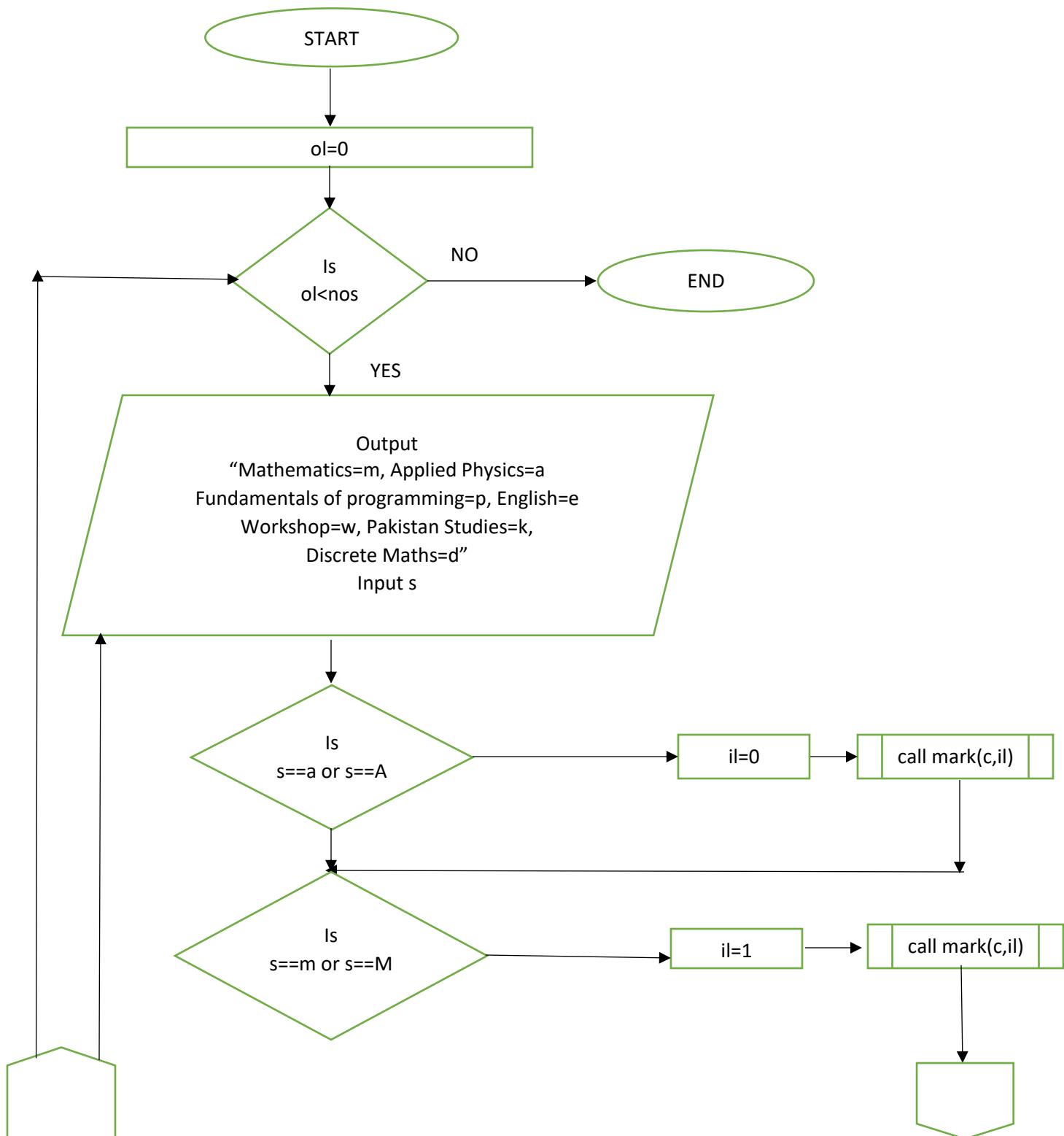
if marks <= 84 && marks >= 72 then
    stdg[ol]= = 'B'

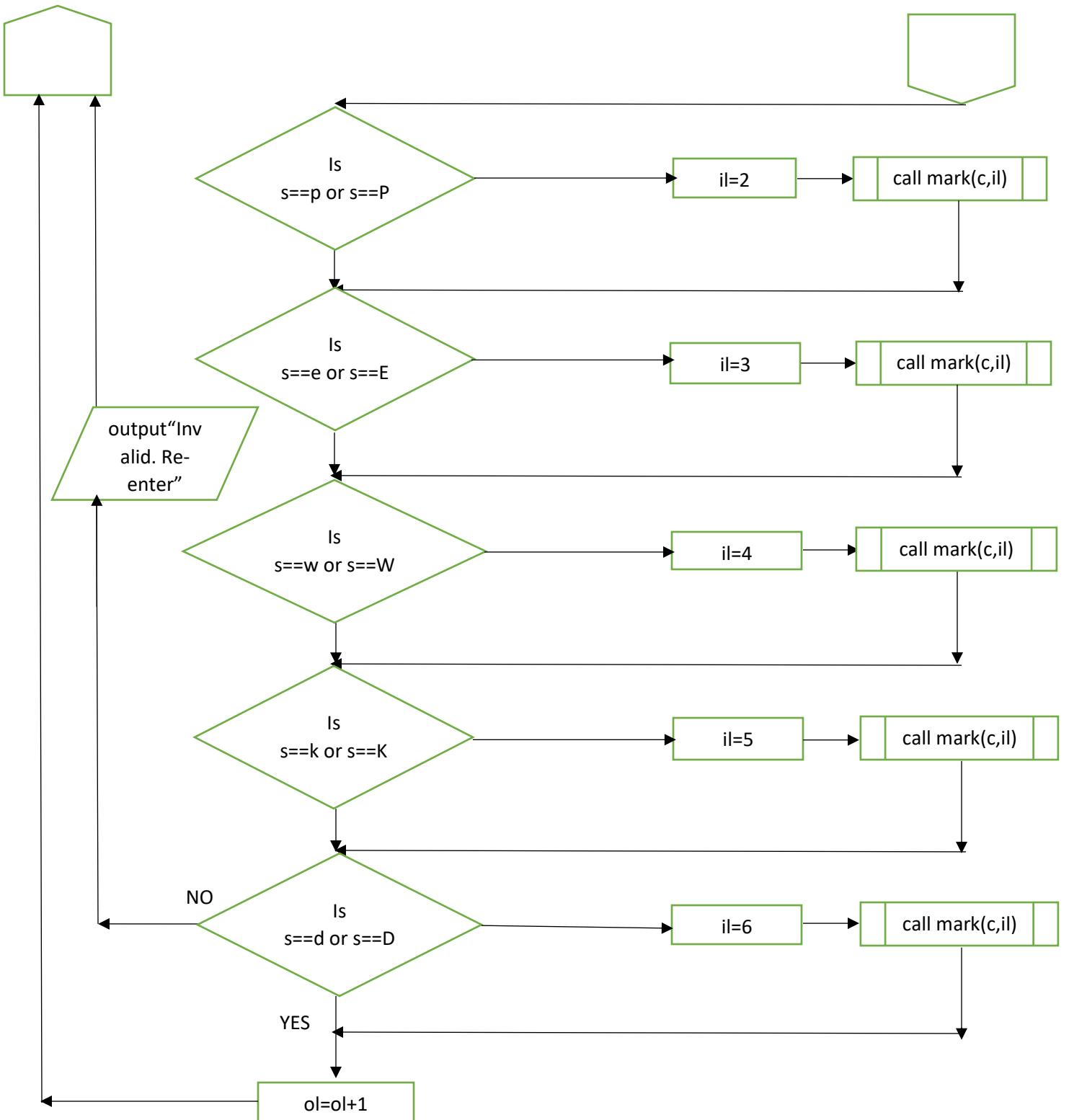
if marks <= 71 && marks >= 60 then
    stdg[ol]= = 'C'

if marks <= 59 && marks >= 50 then
    stdg[ol]= = 'D'

if marks <= 49 && marks >= 0 then
    stdg[ol]= = 'F'
else
    output "Marks entered are out of range!"
ol = ol +1
endif
call output(1)
End
```

7)tmark FUNCTION:





7)Pseudocode:

```
ol=0
For ol<nos
    Output
    "Mathematics=m, Applied Physics=a
    Fundamentals of programming=p, English=e
    Workshop=w, Pakistan Studies=k, Discrete Maths=d"
    Input s
    If (s==a or s==A)
        il=0
        call mark(c,il)
    End if

    If (s==m or s==M)
        il=1
        call mark(c,il)
    End if

    If (s==p or s==P)
        il=2
        call mark(c,il)
    End if

    If (s==e or s==E)
        il=3
        call mark(c,il)
    End if

    If (s==w or s==W)
        il=4
        call mark(c,il)
    End if

    If (s==k or s==K)
        il=5
        call mark(c,il)
    End if

    If (s==d or s==D)
        il=6
        call mark(c,il)
    End if
```

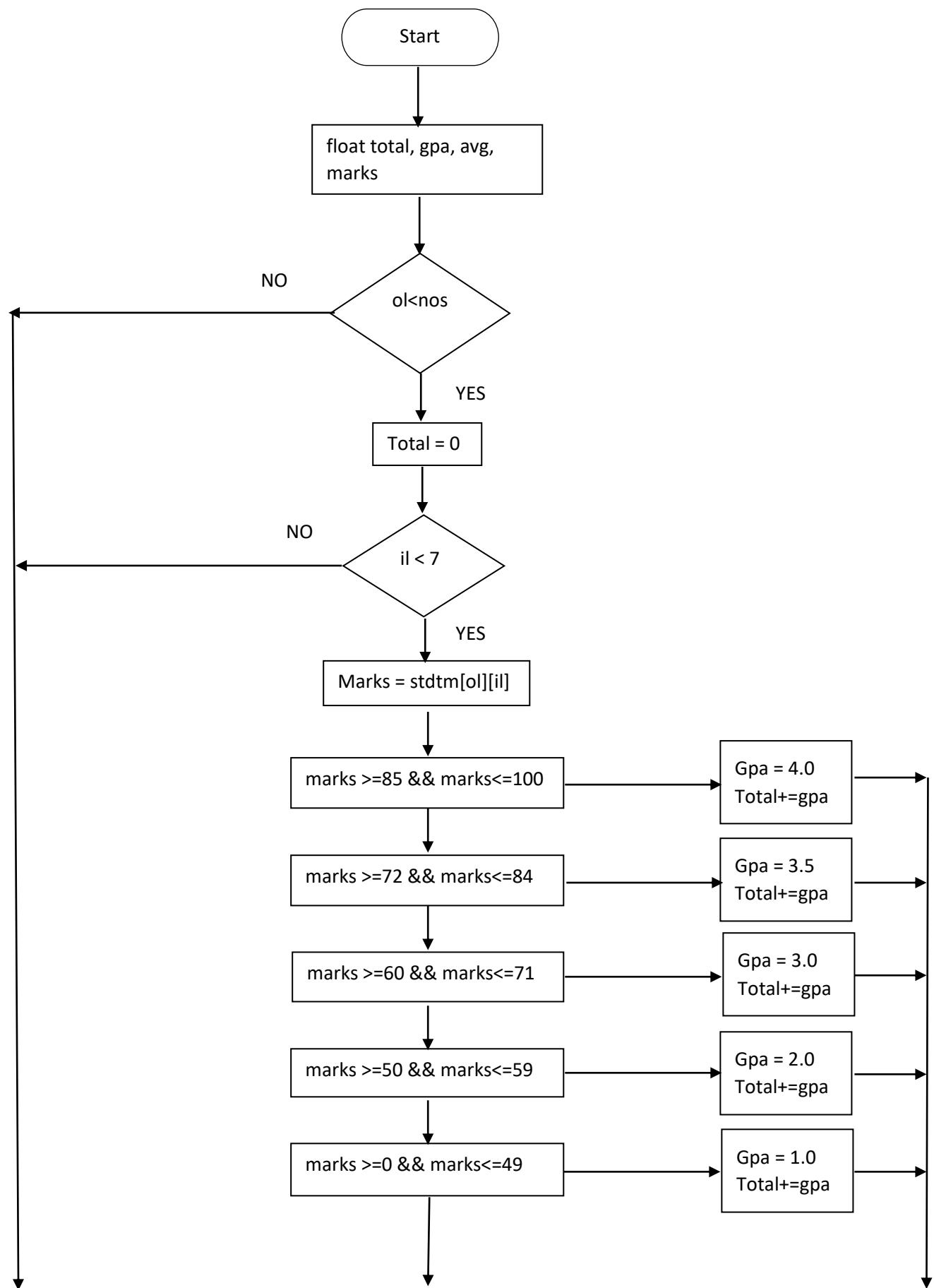
Else

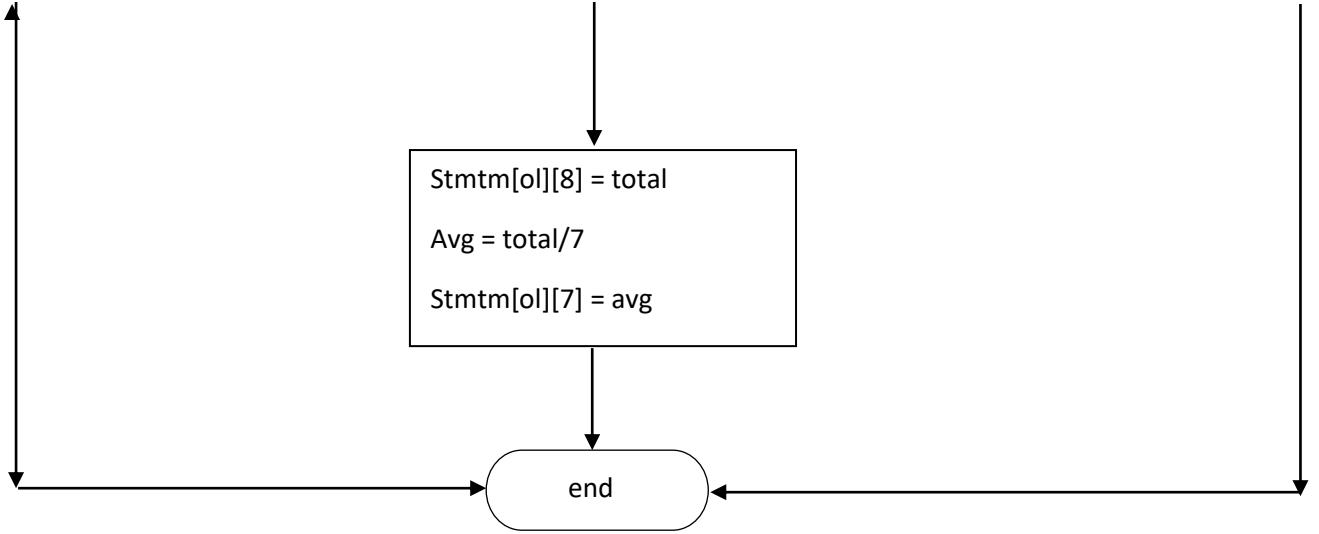
Output "Invalid.Pleas Re-Enter." And return to the menu and ask user to make a valid input

ol=ol+1 and return to the condition of outer loop

End for

9) GPA :

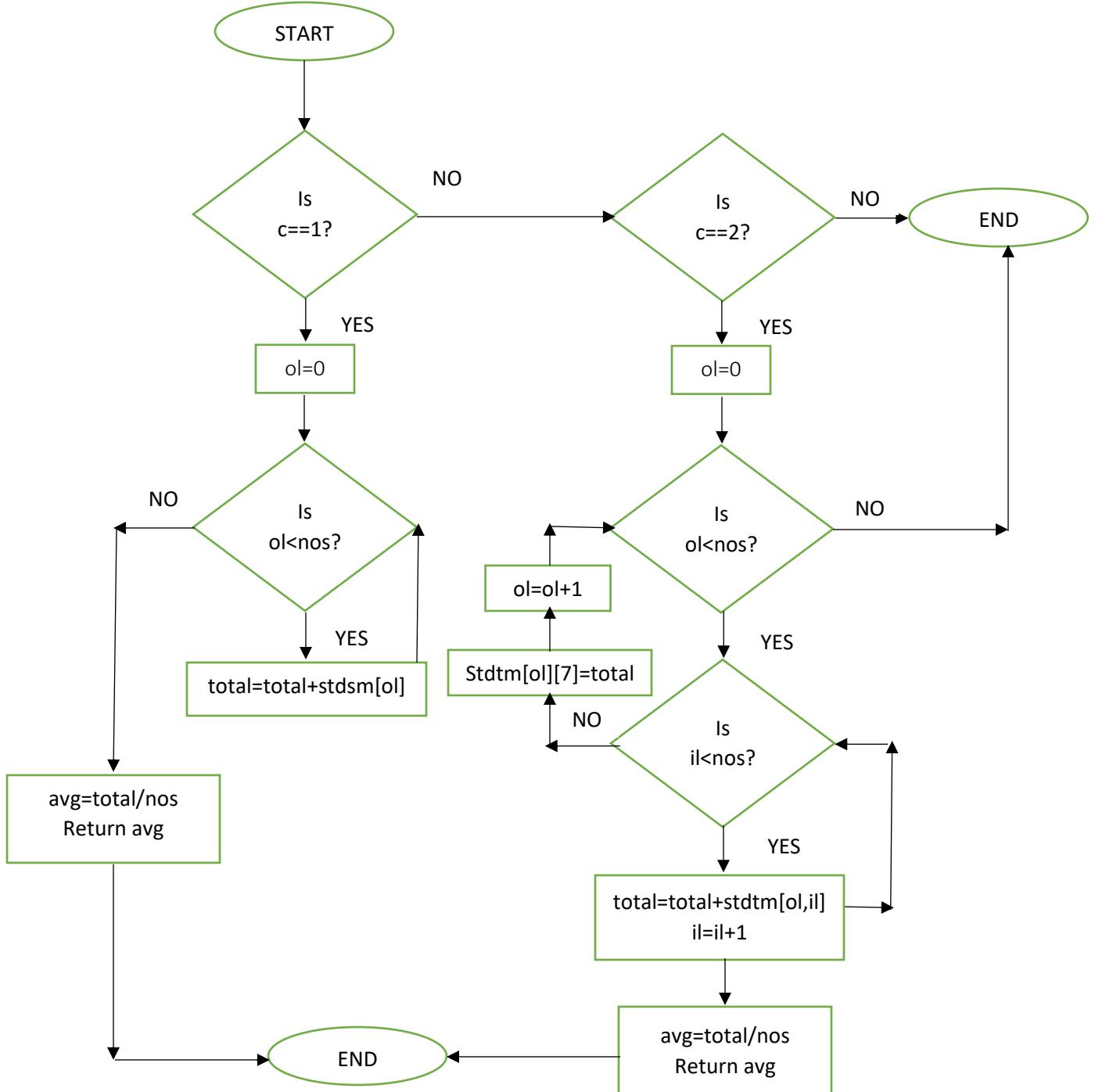




PSEUDOCODE:

```
Float total, gpa, avg, marks
If ol < nos then
    Total = 0
    If il < 7 then
        marks = stdtm[ol][il]
        if marks >=85 && marks<=100 then
            Gpa = 4.0
            Total+=gpa
        Else if marks >=72 && marks<=84 then
            Gpa = 3.5
            Total+=gpa
        Else if marks >=60 && marks<=71 then
            Gpa = 3.0
            Total+=gpa
        Else if marks >=50 && marks<=59 then
            Gpa = 2.0
            Total+=gpa
        else marks >=0 && marks<=49 then
            Gpa = 1.0
            Total+=gpa
        Stmtm[ol][8] = total
        Avg = total/7
        Stmtm[ol][7] = avg
    Else
        Endfor
    Else
        Endfor
```

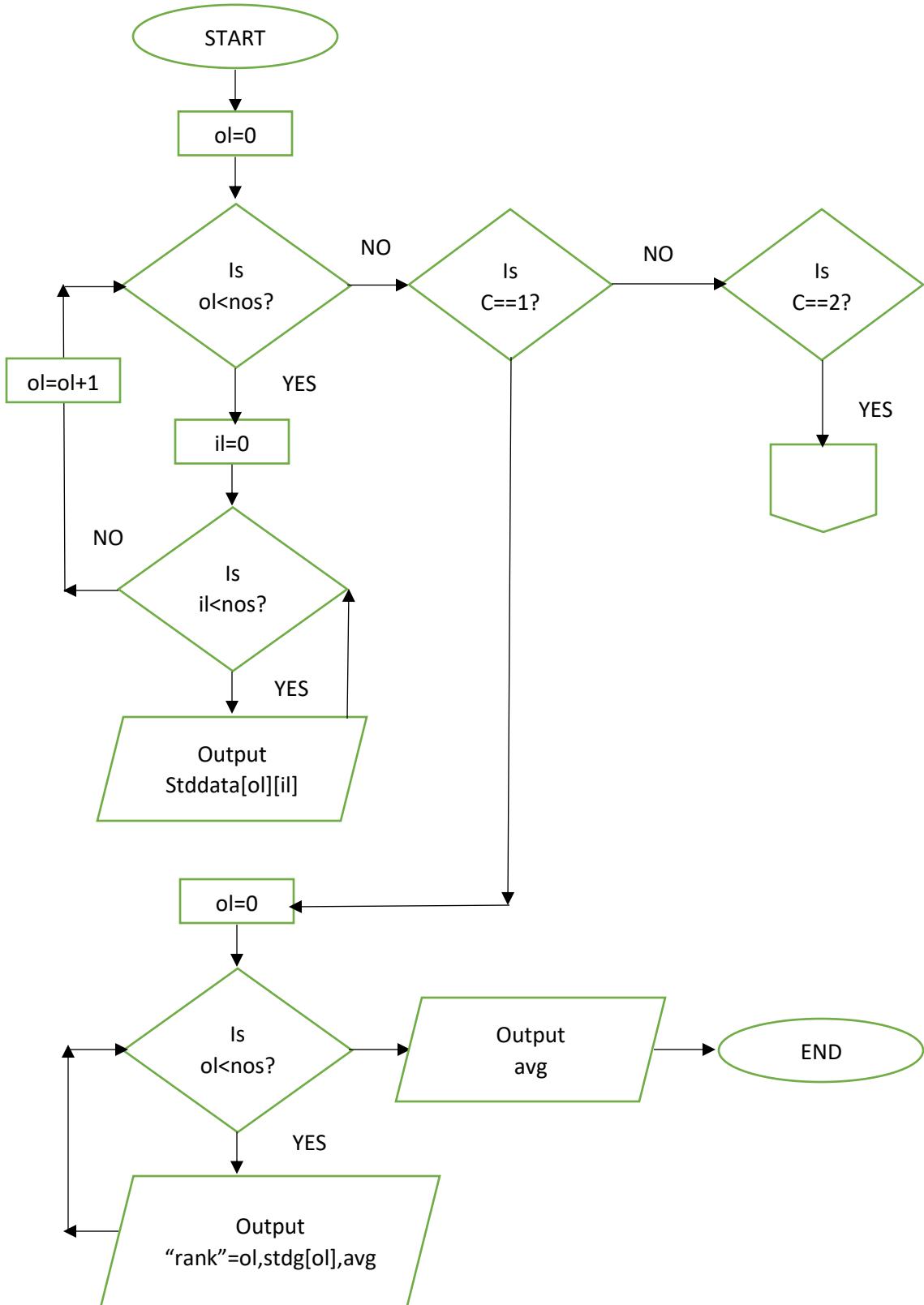
AVERAGE FUNCTION:

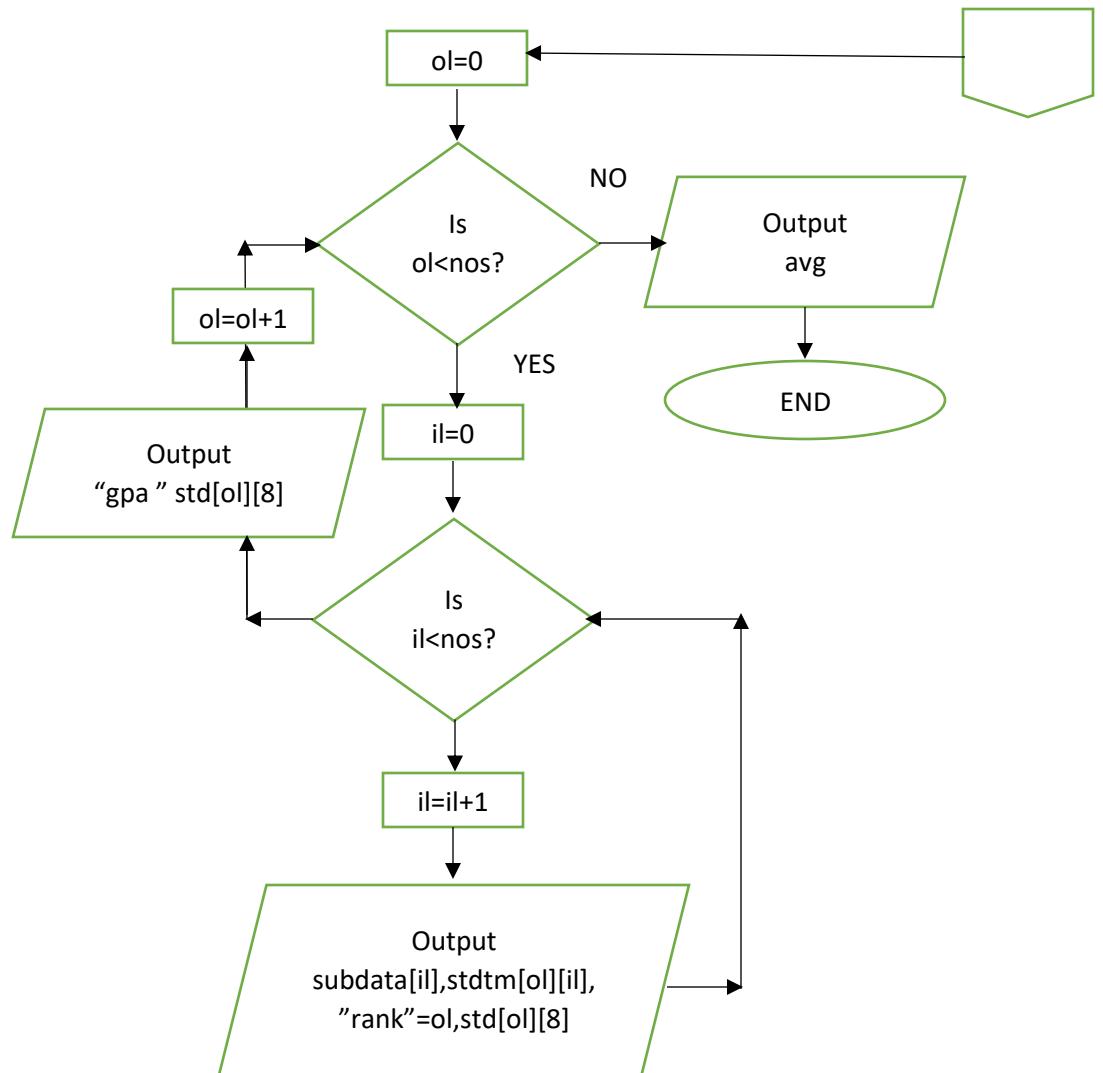


PSEUDOCODE:

```
If c==1 then
ol=0
    If ol is less than nos then
        Total=total+stdsm[ol]
    Else
        avg=total/nos
        Return avg
    Endfor
Else
if c==2 then
ol=0
    If ol is less than nos then
        If il is than nos then
            total=total+stdtm[ol,il]
            il=il+1
        avg=total/nos
        Return avg
    Endfor
    Else
        Stdsm[ol][7]=total
        ol=ol+1
    else
        endfor
else
endfor
```

output FUNCTION:





PSEUDOCODE:

```
ol=0
if ol<nos then
    il = 0
    if il<nos then
        output stddata[ol][il]
    else
        ol=ol+1
elseif
if c==1 then
    ol=0
    if ol<nos then
        output "rank"= ol, stdg[ol], avg
    else
        output avg
    endfor
else
if c==2 then
    ol=0
    if ol<nos then
        il=0
        if il<nos then
            il=il+1
            output subdata[il], stdtm[ol][il], "rank"=ol
        else
            stdtm[ol][8]
            ol= ol + 1
    else
        output avg
    endfor
```

THE END