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Practise programs

① matrix multiplication?

```
input r1, c1
input r2, c2
if c1 ≠ c2 then
    print "Matrix multiplication not possible"
    stop
end if
create matrix A[r1][c1]
create matrix B[r2][c2]
create matrix C[r1][c2]
input elements of matrix A
input elements of matrix B
for i=0 to r1-1
for j=0 to c2-1
    C[i][j] = 0
  for k=0 to c1-1
    C[i][j] = C[i][j] + (A[i][k] * B[k][j])
    End for
  End for
End for
print matrix C
```

② Inverted pyramid pattern.

```
for i = n to 1
print (n-i) spaces
print i stars
move to next line
```

③ find the square root of a perfect square number?

```
input n
if n<0 then
  print "Square root not possible for negative numbers"
  stop
end if
for i=1 to n
if (i*i) = n then
    print "Square root not possible for negative
                numbers"
    stop
end if
for i=1 to n
  if (i * i) = n then
   print "positive square root = ", i
   print "Negative square root = ", -i
    stop
  end if
end for
print "not a perfect square".
```

⑤ hollow square Dollar pattern?

Sol:-

```
start
  Input n
for i=1 to n
 for j=1 to n
   if i=1 or i=n or j=1 or j=n then
      print "$"
   else
     print " "
   end if
   end for
  print new line
End for
```

⑥ accepts a string from user and desplays the same string after removing vowels

Sol:- Start

Input string str

create empty string result

for each character ch in str

if ch is not 'a', 'e', 'i', 'o', 'u', and

not 'A', 'E', 'I', 'O', 'U'

Add ch to result

End if

End for

print result

stop

7) arrange the letters of the word alphabetically in reverse order.

Sol:- Start

input word

convert word into character array arr[]

n = length of arr

for i = 0 to n-2

for j = i+1 to n-1

if arr[i] < arr[j] then

Swap arr[i] and arr[j]

End if

End for

End for

print characters of arr

stop

8) Armstrong number or not.

Sol:- Start

input num

```
Set temp = num
Set Sum = 0
while temp > 0
  digit = temp % 10
    Sum = Sum + (digit * digit * digit)
    temp = temp / 10
  End while
  if Sum == num
  print "Armstrong number"
  else
    print "Not an Armstrong number"
  end if
  Stop
```

(9) Given character is present in a string or not

Sol :-

```
Start
input string str
input character ch
set found = false
for i = 0 to length (str) - 1
  if str[i] == ch then
    print "character found at index"; i
    set found = true
  End if
End for
if found == false Then
    print ("character not present in the string"
  End if
  Stop
```

(10) find the no. of composite numbers in an array of elements:

```
Start
Input n
create array A[n]
Input elements into array
count = 0
for i=0 to n-1
  num = A[i]
  if num > 1 then
  factorCount = 0
  for j=1 to num
  if num%j==0 then
  factorcount = factorCount +1
  End if
  End for
  if factorcount >2 then
    count = count +1
  End if
  End if
  Print count
```

(11) find the mth maximum number and Nth minimum

Solve

```
Start
Input size n
Create array A[n]
Input elements into array A
Input M
Input N
for i=0 to n-2
  for j=0 to n-2-i
    if A[j]> A[j+1] then
    Swap A[j] and A[j+1]
    End if
  End for
End for
  Nth_min = A[N-1]
  Mth_max = A[n-M]
  Sum = Mth_max + Nth_min
  Difference = Mth_max -
               Nth_min
  Print Nth_min
  Print Mth_max
  Print Sum
  Print Difference
```

(12) To print the total available in the ATM machine

Total denominations are 2000, 500, 200, 100

Sol:- Start

Declare array denomination[4] = {2000, 500, 200, 100}

Declare array notes[4]

print "Enter denomination priority (any order of 2000, 500, 200, 100)"

for i = 0 to 3

input denomination[i]

End for

for i = 0 to 3

print "Enter number of notes for", denomination[i]

Input notes[i]

End for

for i = 0 to 3

totalAmount = totalAmount + (denomination[i] * notes[i])

End for

print "Total Available Balance =", totalAmount

Stop

(13) Given string is palindrome or not

" number " " "

Sol:- start

Print "Enter your choice"

Print "1. check string palindrome"

Print "2. check Number palindrome"

input choice

if choice = 1 then

input String

set reverse = " "

```
for i = length(string)-1 down to 0
reverse += string[i]
end for
if string = reverse Then
Print "String is palindrome"
Else
print "String is not palindrome"
end if
else if choice = 2 then
Input number
set temp = number
set revers = 0
while n > 0
deget = n %.10
reverse = reverse * 10 +deget
n /= 10
End while
if temp = reverse then
Print "Number is palindro
me"
Else
Print "Number is not
palendrome"
End if
Else
print "Invalid choice"
End if
```

(14) Convert Decimal number equivalent to Binary number and octal numbers?

Sol:-

```
Start
Input n
Create empty stack or array
while n>0
remainder = n%.2
Store remainder
n = n/2
End while
Print Stored remainders in reverse order
Stop
```

15) In an organization they decide to give bonus to all the employees on New year. A 5% bonus

Sol:-

```
Start
Input Salary
Input grade
if grade = 'A' then
    bonus = 0.05 * salary
else if grade = 'B' then
    bonus = 0.10 * Salary
End if
if Salary < 10000 then
extra_bonus = 0.02 * Salary
bonus = bonus + extra_bonus
End if
final_Salary = Salary + bonus
Print "Bonus =", bonus
print "Final Salary =", final_
      Salary
```

16) To print first n perfect numbers.

```
Start
Input n
count = 0
num = 1
while count < n
    sum = 0
for i = 1 to num/2
if num % i == 0 then
    sum = sum + i
End if
End for
if sum == num and num != 0 then
    print num
    count = count + 1
End if
num += 1
End while
stop
```

17) Convert Decimal number Equivalent to Gray code number?

Sol:-

```
Start
Input decimal number
    binary = convert decimal to binary
```

```
gray[0] = binary[0]
for i = 1 to length(binary) - 1
    if binary[i] == binary[i-1]
        gray[i] = 0
    else
        gray[i] = 1
    End if
End for
print gray code
stop
```

18) Write a program to calculate tax given the

a) income is less than or equal to 1,50,000

b) taxable income is 1,50,000 - 3,00,000 the charge 10% tax

a)

```
START
input income
if income <= 150000 then
    tax = 0
else if income <= 300000 then
    tax = income * 10/100
else if income <= 500000 then
    tax = income * 20/100
else
    tax = income * 30/100
End if
print "Tax amount =", tax
stop
```

19) To read the numbers until -1 is encountered average of positive.

Sol:-

```
Start
Initialize:
    posSum = 0
    negSum = 0
    posCount = 0
    negCount = 0
Loop
  Input number
if number = -1 then
    Exit loop
  End if
  if number > 0 then
  posSum = posSum + number
  posCount = posCount + 1
Else if number < 0 then
  negSum = negSum + number
  negCount += 1
End if
End loop
  if posCount > 0 then
  posAverage = posSum / posCount
  Print "Average of +ve numbers=",
    posAverage
  Else
    Print "No +ve numbers
          entered"
  end if
  If negCount > 0 then
  negAverage = negSum / negCount
Print " Avg of -ve numbers = ", negAvg
  else
    Print "No -ve numbers Entered"
End if
  Stop
```

20) Start

```
Declare character ch
Declare uppercase = 0
Declare lowercase = 0
Declare number = 0
Print ("Enter Characters (* to stop): "
    Read ch
    while ch ≠ '*'
      if ch is between 'A' and 'Z' then
```

```
        uppercase = uppercase + 1
    else if ch is b/w 'a' and 'z' then
        lowercase = lowercase + 1
    else if ch is b/w '0' and '9' then
        number = number + 1
    End if
    Read ch
End while
```