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Corrigé de la série de TP N°1 – Exercices supplémentaires sur les matrices

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**Exercice N°1**

```
1 program exo1;
2 var
3 A,B,C: array [1..100,1..100] of real;
4 N,M,i,j : integer;
5 begin
6   writeln ('Donner les dimensions de la matrice A et B :');
7   read(N,M);
8
9   writeln ('Donner les composantes de la matrice A :');
10  for i := 1 to N do
11    for j := 1 to M do
12      read (A[i,j]);
13
14  writeln ('Donner les composantes de la matrice B :');
15  for i := 1 to N do
16    for j := 1 to M do
17      read (B[i,j]);
18
19  for i := 1 to N do
20    for j := 1 to M do
21      C[i,j] := A[i,j] + B[i,j];
22
23  for i := 1 to N do
24    begin
25      for j := 1 to M do
26        write (C[i,j] :8:0);
27        writeln();
28      end;
29
30 end.
```

**Exercice N°2**

**Question 1 :**

```
1 program exo1;
2 var
3 A: array [1..100,1..100] of real;
4 N,M,i,j : integer;
5 S,moyenne : real;
6 begin
7   writeln ('Donner les dimensions de la matrice A :');
8   read(N,M);
9
10  writeln ('Donner les composantes de la matrice A :');
11  for i := 1 to N do
12    for j := 1 to M do
13      read (A[i,j]);
14
15  S:= 0;
16  for i := 1 to N do
17    for j := 1 to M do
18      S:= S + A[i,j];
19
20  moyenne := S / (n*m);
21
22  writeln ('La somme = ', s:8:0);
23  writeln('la moyenne = ',moyenne:8:0);
24
25 end.
```

## Question 2:

```
1 program exo2_2;
2 var
3 A: array [1..100,1..100] of real;
4 N,M,i,j : integer;
5 S,p : real;
6 begin
7   writeln ('Donner les dimensions de la matrice A:');
8   read(N,M);
9
10  writeln ('Donner les composantes de la matrice A :');
11  for i := 1 to N do
12  for j := 1 to M do
13  read (A[i,j]);
14
15  writeln('-----');
16  for i := 1 to N do
17  begin
18  S:=0;
19  for j := 1 to M do
20  S:= S + A[i,j];
21
22  writeln ('la somme de la ligne numero ',i, 'est :',s:8:0 );
23  end;
24  writeln('-----');
25  for i := 1 to M do
26  begin
27  p:= 1;
28  for j := 1 to N do
29  P:= P * A[j,i];
30  writeln ('le produit de la colonne numero ',i, 'est :',p:8:0 );
31  end;
32 end.
```

## Exercice N°3

```
1 program exo3;
2 var
3 A,B,result: array [1..100,1..100] of real;
4 N,M,L,i,j,k : integer;
5
6 begin
7   writeln ('Donner les dimensions de la matrice A et B:');
8   read(N,M,L);
9
10  writeln ('Donner les composantes de la matrice A :');
11  for i := 1 to N do
12  for j := 1 to M do
13  read (A[i,j]);
14
15
16  writeln ('Donner les composantes de la matrice B :');
17  for i := 1 to M do
18  for j := 1 to L do
19  read (B[i,j]);
20
21  for i:=1 to N do
22  for j:=1 to L do
23  begin
24  result[i, j] := 0;
25  for k:=1 to M do
26  result[i,j] := result[i,j]+ A[i,k]*B[k,j];
27  end;
28  writeln ('-----');
29  for i:=1 to N do
30  for j:=1 to L do
31  write (result[i, j]:8:0);
32 end.
```

## Exercice N°4

```
1 program exo4;
2 var
3 A: array [1..100,1..100] of real;
4 N,M,i,j,x,posi,posj : integer;
5 test: boolean;
6 begin
7   writeln ('Donner les dimensions de la matrice A:');
8   read(N,M);
9
10  writeln ('Donner les composantes de la matrice A :');
11  for i := 1 to N do
12    for j := 1 to M do
13      read (A[i,j]);
14
15  writeln ('Donner la valeur recherchée X :');
16  read (x);
17  test := false;
18
19  for i := 1 to N do
20    for j := 1 to M do
21      if ( A[i,j] = X) then
22        begin
23          test := true;
24          posi := i;
25          posj := j;
26        end;
27
28    if (test = true) then
29      writeln ('X se trouve dans la position (ligne : ',posi,' colonne :',posj , ')')
30    else
31      writeln ('X n appartient pas a la matrice 1');
32 end.
```

## Exercice N°5

```
1 program exo5;
2 var
3 A: array [1..100,1..100] of real;
4 N,M,i,j, posi,posj: integer;
5 max : real;
6 begin
7   writeln ('Donner les dimensions de la matrice A:');
8   read(N,M);
9
10  writeln ('Donner les composantes de la matrice A :');
11  for i := 1 to N do
12    for j := 1 to M do
13      read (A[i,j]);
14
15  max := A[1,1];
16  posi := 1; posj :=1;
17
18  for i := 1 to N do
19    for j := 1 to M do
20      if ( A[i,j] > max) then
21        begin
22          max := A[i,j];
23          posi := i;
24          posj := j;
25        end;
26
27  writeln ('Le max = ',max:8:0,' il se trouve dans la position (ligne : ',posi,' colonne :',posj , ')')
28 end.
```