Practice Exercises N 2: Arrays in C

Exercise 1:

Write a C program that reads an array of 10 reals, and then prints:

- The array mean.
- The number of positive, negative and zero elements.

Exercise 2

Write a C program to determine the maximum and the minimum values in an array of ten integers, with their positions (index) in the array.

Exercise 3

Write a C program that searches for a user-input number in an array of 10 integers, and then displays its first index if it exists.

Exercise 4

Write a C program to determine the number of occurrences of a given element (entered by the user) in a matrix of integers (4*4)

Exercise 5

Write a C program that displays the transpose of a matrix of integers (3*3) entered by the user.

CORRECTION

Exercise 1 :

```
#include <stdio.h>
main()
{ float tab[10], som, M ;
int i, pos, neg, nul;
printf ("enter the elements of the table ");
for(i=0; i<10;i++)
    scanf("%f", &tab[i]);
// number of positive, negative and zero elements + the sum
for (i=0,pos=0, neg=0, nul=0,som=0;i<10;i++)
{ if (tab[i]>0) pos++ ;
  else
      if (tab[i]<0) neg++;
           else nul ++ ;
 som = som+tab[i];
}
M =som/10;
printf ("the number of positive elements =%d \n negative=%d \n zero=%d \n the
mean=%f", pos, neg, nul, M);
}
```

Exercise 2

```
#include <stdio.h>
main()
{ int tab[10], i, max, min, k, r;
printf ("enter the elements of the table ");
for(i=0; i<10;i++)
    scanf("%d", &tab[i]);
max=min=tab[0];
for (i=1;i<10;i++)
{     if (max<tab[i]) {max=tab[i]; k=i;}
     if (min>tab[i]) {min=tab[i]; r=i;}
```

```
}
printf ("the maximum = %d \t it exists in the index %d \n", max, k );
printf ("the minimum= %d \t it exists in the index %d \n", min, r );
}
```

Exercise 3

```
#include <stdio.h>
main()
{ int tab[10], n ,trouv, i ;
printf ("enter the elements of the table ");
for(i=0; i<10;i++)
    scanf("%d", &tab[i]);
printf("enter a number");
scanf("%d", &n);
i=0; trouv=0;
while ((trouv==0)&& (i<10))
{ if (tab[i]==n) trouv=1 ;
 else
    i++;
}
if (trouv==1)
printf ("the number exists at the index  %d ", i);
else
printf ("the number does not exist in the table ");
}
```

Exercise 4

```
#include <stdio.h>
main()
{ int M[4][4], i, j, n, k ;
```

```
printf ("enter the elements of the table ");
for(i=0; i<4;i++)
    for (j=0;j<4;j++)
    scanf("%d", &M[i][j]);
printf("enter a number");
scanf("%d", &n);
k=0;
for (i=0; i<4;i++)
    for (j=0;j<4;j++)
     if (M[i][j]==n) k++;
printf ("the input number appears %d times in the matrix ", k);
}
```

Exercise 5

```
#include <stdio.h>
main()
{ int M[3][3], i,j,n, x ;
printf ("enter the elements of the table ");
for(i=0; i<3;i++)
    for (j=0;j<3;j++)
    scanf("%d", &M[i][j]);
    printf("the original matrix :\n ");
    for (i=0; i<3;i++)
      for (j=0;j<3;j++)
        printf ("%d\t", M[i][j]);
    printf("\n");

   printf("the transposed matrix:\n ");

   for(i=0; i<3;i++)
      for (j=i+1;j<3;j++)
       {   x=M [i][j];
```

```
        M[i][j]=M[j][i];
        M[j][i]=x;
       }
for(i=0; i<3;i++)
  { for (j=0;j<3;j++)
       printf("%d\t", M[i][j]);
   printf("\n");
  }
}
```