

Solution of all exercises of DW N° 8 : The recursion in c language :

```
#include <stdio.h>
```

//exo 02 the sum of n integer

```
int sumexo02(int n )
{   if (n==1 )
    return 1;
    else
    return n+sumexo02(n-1);
}
```

// exo 03 the sum of two numbers

```
int sumexo03(int n, int y )
{   if (n==0)
    return y;
    else
    return 1+sumexo03(n-1,y);
}
```

//exo 04 the sum of the digits

```
int sumch(int n )
{   if (n<10 )
    return n;
    else
    return n%10+sumch(n/10);
}
```

//exo 05 the position of digit

```
int sumchi(int n, int i )
{
    if (i==1 )
        return n%10;
    else
        return sumchi(n/10,i-1);
}
```

//exo 06 the GCD

```
int divexo06(int c,int d)
{   if (c<d) return 0;
    else
    return 1+ divexo06(c-d,d);
}

int GCD(int a,int b)
{   if (a==b) return a;
    else
    {if (a>b)
        return GCD(a-b,b);
    else
        return GCD(a,b-a);
    }
}
```

int main()

```
{int n,i,a,b,x;
printf(" give an integer number \n");
scanf("%d",&n);
printf(" exo 02 the sum of first n numbers started
from 1 to n is %d:\n",sumexo02(n));
```

```
printf(" give two integers number \n");
scanf("%d %d",&a,&b);
printf(" exo 03 the sum of two numbers is
%d:\n",sumexo03(a,b));
printf(" give an integer number \n");
scanf("%d",&x);
printf(" exo 04 the sum of all digits of n is %d
:\n",sumch(x));
printf(" give the position of the number do you want
\n");
scanf("%d",&i);
printf(" exo 05 the ith number of n is %d
:\n",sumchi(x,i));
printf(" exo 06 the division \n");
int c,d;
printf(" give two natural numbers \n");
scanf("%d %d ",&c,&d);
printf(" the result of the division of c by d is \n
%d",divexo06(c,d));
printf(" exo 07 the GCD \n");
int e,f;
printf(" give two natural numbers \n");
scanf("%d %d ",&e,&f);
printf(" the result of the GCD is \n
%d",GCD(e,f));
return 0;
}
```

// exo 07 the result of division

```
#include <stdio.h>
```

```
int divisexo06(int nbr1, int nbr2)
{
    if (nbr1<nbr2)
        return 0;
    else
        return 1+ divisexo06((nbr1-nbr2),nbr2);
}
```

int main()

```
{ int nbr1, nbr2;
printf("Give two integers: ");
scanf("%d %d", &nbr1, &nbr2);
printf("The result of the division %d and %d =
%d", nbr1, nbr2, divisexo06(nbr1,nbr2));
return 0;
}
```

Exercice 08 : Palindrom

```
#include <stdio.h>
```

```
#include <stdlib.h>
```

```
#include <string.h>
```

```
void inverse (char *debut, char *fin)
```

```
{   if (debut >=fin) return;
    char t= *debut;
    *debut=*fin;
    *fin=t;
    inverse(debut+1,fin-1);
```

```

}
void inverse02 (char *ch, int l)
{ if (l <1) return;
  char t= ch[0];
  ch[0]=ch[l-1];
  ch[l-1]=t;
  inverse02(ch+1,l-2);
}
int main()
{ char chaine[50],chaine2[50];
int l;
  printf("give a string !\n");
  gets(chaine);
  /* inverse(chaine, chaine+strlen(chaine)-1);
  printf(" %s \n ",chaine);*/
  strcpy(chaine2,chaine);
  printf("%s \n",chaine2);
  inverse02(chaine,strlen(chaine));
  printf(" %s \n",chaine);
  if(strcmp(chaine2,chaine)==0)
    printf("palindrom \n");
  else
    printf(" not palindrom \n");
  return 0;
}
//exo 09 the average of array
#include <stdio.h>
#include <stdlib.h>
float average(int tab[],int l,int lbegin)
{ if (l==0)
  return 0;
  else
    return (float)(tab[l-1]/(float)lbegin+average(tab,l-1,lbegin));
}
int main()
{int tab[100];
int i,n;
  printf("give the length of array \n ");
  scanf("%d",&n);
  printf("give the numbers!\n");
  for(i=0;i<n;i++)
  { printf("tab[%d]=",i);
    scanf("%d",&tab[i]);
  }
  printf(" the average of this array is
  %e",average(tab,n,n));
  return 0;
}
//exo 10 elements sorted in ascending order
#include <stdio.h>
#include <stdlib.h>
#include <stdbool.h>
bool tri(int tab[],int l)

```

```

{ if (l==1)
  return true;
  else
    {if(tab[l-1]>tab[l-2])
      return
      tri(tab,l-1);
      else
        return false;
    }
}
int main()
{int tab[100];
int i,n;
  printf("give the lenght of array \n ");
  scanf("%d",&n);
  printf("give the numbers!\n");
  for(i=0;i<n;i++)
  { printf("tab[%d]=",i);
    scanf("%d",&tab[i]);
  }
  printf(" the elements of this table elements are
  sorted in ascending order %d ",tri(tab,n));
  return 0;
}
//Exo 11 the position of an integer if it is exist
#include <stdio.h>
#include <stdbool.h>
int pos(int tab[],int l, int x)
{ if (l==0)
  return -1;
  else
    { if (tab[l-1]==x)
      return l;
      else return
      pos(tab,l-1,x);
    }
}
int main()
{int tab[100];
int i,n,x;
  printf("give the lenght of array \n ");
  scanf("%d",&n);
  printf("give the numbers!\n");
  for(i=0;i<n;i++)
  { printf("tab[%d]=",i);
    scanf("%d",&tab[i]);
  }
  printf(" give the number to check \n ");
  scanf("%d",&x);
  printf(" the number %d is in the %dth position
  ",x,pos(tab,n,x));
  return 0;
}

```