Unit-4
Part-2

Course Name: BCA

Subject Code : 1CS1010101

Subject Name: FUNDAMENTALS OF COMPUTER PROGRAMMING

Created By: Dr. Ronak Patel, I/C Principal, Shri C J Patel College of Computer Studies, Sankalchand Patel University,Visnagar.

Array

- Array is a group of variables that share a common name, common type and common size.
- E.g. Rollno[100], matrix[3][3]
- There are three types of Array
  1. **One dimensional arrays**
  2. **Two dimensional arrays**
  3. **Multidimensional arrays**

Program to calculate average of given numbers using Array

```
#include<stdio.h>
#include<conio.h>
void main(void)
{
  int x[100],sum=0,i,limit,avg;
   clrscr();
   printf(“Enter the limit\n");
   scanf("%d",&limit);
  printf("Enter the values\n");
  for(i=0;i<limit;i++)
  {
   scanf("%d",&x[i]);
   sum=sum+x[i];
   }
  avg=sum/limit;
  printf("Sum=%d\n",sum);
  printf("Avg=%d\n",avg);
  getch();
}
```

Output:

```
Enter the limit
5
Enter the values
10
20
30
40
50
Sum=150
Avg=30
```

One Dimensional Array

- An array name is using only one subscript is called a single subscripted or a one dimensional array.
- E.g

  ```
  int x[5];
  ```

  Here, there are total five variables are declared.

  They are x[0], x[1], x[2], x[3], x[4]
- a subscript is always begin with number 0.
- The values to the array elements can assigned as follows.

  ```
  x[0]=35;
  x[1]=40;
  x[2]=20;
  x[3]=57;
  x[4]=19;
  ```

Initialization of one dimensional Array

- When array is declared and at the time of declaration it get values its called initialization array.
- The following program implement the concept of initialization of two dimensional array.

```
#include<stdio.h>
#include<conio.h>
void main(void)
{
  int i;
  int x[5]={10,20,30,40,50};
  clrscr();

  for(i=0;i<5;i++)
  {
     printf("x[%d]=%d\n",i,x[i]);
  }
  getch();

}
```

Output:

```
x[0]=10
x[1]=20
x[2]=30
x[3]=40
x[4]=50
```

Two Dimensional Array

- An array name is using two subscript is called a two subscripted or a two dimensional array.
- E.g

```
int x[3][3];
```

Here, there are total 9 variables are declared.

They are

```
x[0][0]    x[0][1]    x[0][2]
x[1][0]    x[1][1]    x[1][2]
x[2][0]    x[2][1]    x[2][2]
```

Initialization of two dimensional Array

- When array is declared and at the time of declaration it get values its called one dimensional array.
- The following program implement the concept of initialization of two dimensional array.

```
#include<stdio.h>
#include<conio.h>
void main(void)
{
   int i,j;
   int x[3][3]={10,20,30,40,50,60,70,80,90};
   clrscr();

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

}
```

Output:

```
x[0][0]=10
x[0][1]=20
X[0][2]=30
x[1][0]=40
x[1][1]=50
x[1][2]=60
x[2][0]=70
x[2][1]=80
x[2][2]=90
```

Multi Dimensional Array

- An array name is using more than two subscript is called a multi subscripted or a multi dimensional array.
- E.g

int x[2][2][2];

Here, there are total 8 variables are declared.

They are

```
 x[0][0][0]      x[0][0][1]
 x[0][1][0]      x[0][1][1]
x[1][0][0]      x[1][0][1]
 x[1][1][0]      x[1][1][1]
```

Program to convert decimal number to binary number

```
#include<stdio.h>
#include<conio.h>
void main(void)
{
  int number, rem, bin[100], i=0, j;
  clrscr();
  printf("Enter any decimal no\n");
  scanf("%d",&number);
  while(number!=0)
  {
    rem=number%2;
    bin[i]=rem;
    i++;
    number=number/2;
  }
printf("Binary no=\n");

for(j=i-1;j>=0;j--)
{
  printf("%d\t",bin[j]);
}

getch();
}
```

Output:

```
Enter any decimal no
12
Binary no=
1  1  0  0
```

Program to convert decimal number to octal number

```
#include<stdio.h>
#include<conio.h>
void main(void)
{
  int number, rem, octal[100], i=0, j;
  clrscr();
  printf("Enter any decimal no\n");
  scanf("%d",&number);
  while(number!=0)
  {
    rem=number%8;
    octal[i]=rem;
    i++;
    number=number/8;
  }
printf("Octal no=\n");

for(j=i-1;j>=0;j--)
{
  printf("%d\t",octal[j]);
}
getch();
}
```

Output:

```
Enter any decimal no
100
Octal no=
1  4   4
```

Program to convert decimal number to hexa decimal number

```
#include<stdio.h>
#include<conio.h>
void main(void)
{
 int number,rem,hexa[100],i=0,j;
 clrscr();
 printf("Enter any decimal no\n");
 scanf("%d",&number);
 while(number!=0)
 {
  rem=number%16;
  hexa[i]=rem;
  i++;
  number=number/16;
 }
printf(“Hexa decimal no=\n");

for(j=i-1;j>=0;j--)
{
    if(hexa[j]==10)
     {
      printf("A\t");
     }
    else if(hexa[j]==11)
     {
     printf("B\t");
     }
    else if(hexa[j]==12)
     {
      printf("C\t");
     }
    else if(hexa[j]==13)
     {
      printf("D\t");
      }
    else if(hexa[j]==14)
     {
      printf("E\t");
      }
    else if(hexa[j]==15)
     {
      printf("F\t");
      }
    else
    {
     printf("%d\t",hexa[j]);
    }
}
getch();
}
```

Output:

```
Enter any decimal no
125
Hexa decimal no=
7   D
```

Program to arrange numbers in ascending and descending oreder(Sorting)

```
#include<stdio.h>
#include<conio.h>
void main(void)
{
   int x[100],limit,i,temp,pass;
   clrscr();
   printf("Enter the limit\n");
   scanf("%d",&limit);
   printf("Enter the values\n");
   for(i=0;i<limit;i++)
   {
   scanf("%d",&x[i]);
   }
  for(pass=1;pass<limit;pass++)
     {
     for(i=0;i<limit-1;i++)
       {
          if(x[i]>=x[i+1])
            {
                    temp=x[i];
                    x[i]=x[i+1];
                    x[i+1]=temp;
                  }
        }
     }
```

```
printf("Ascending order=\n");

    for(i=0;i<limit;i++)
    {
    printf("%d\t",x[i]);
    }

    printf("\nDescending order=\n");

    for(i=limit-1;i>=0;i--)
    {
    printf("%d\t",x[i]);
    }
```

Output:

```
Enter the  limit
5
Enter the values
34
55
75
6
3
Ascending order
3   6   34   55   75
Descending order
75  55   34  6  3
```

End of part-2