Arrays :-

• How to Define An Array :-

int A[5] = { 3,2,7,5,4 };

3	2	7	5	4
0	1	2	3	4

If you say : int A[5]={2,3};

2	3	0	0	0

• How to define An Array that a user enters it's elements :-

int grades [4];
int i;
for (i=0; i<4; i++)
{
    printf("Enter ⎯⎯⎯ ");
    scanf ("%d", & grade [i]);
}

Note :-
• You can't say
    A[2] = { 1, 2, 3}; ✗

Note :-
• You have to define The size of an Array by a variable
    Ex #include <stdio.h>
        #define S 4
        int A[S];

• How to sum the elements of an Array :-

for (i=0; i<5; i++)
    sum += A[i]

- **How to know the Max of the elements**

```
for (i=0; i<S; i++)
{
    if (A[i] > max)
        max = A[i];
}
```

- ## How to Use Arrays With functions

When passing An Array to a function

↳ int max(int [ ] , int);
                    فراغ

```
int main ()
{

    m = max (A, S)          ← size
           ↑
         Name

}
    int max ( int X[ ] , int n )          ← size
```

- ## Using Arrays in a linear search

To search for an element :-

- let's say we have a 5 elements Array

$A[5] = \{1, 2, 4, 5, 6\}$

- If I want to search for a specific element

let's say 5 here Then :-

```
#include <stdio.h>
#define S 5
int linSearch(int [], int, int);
.
.
{
    int key, A[s] = {1,2,4,5,6};
    printf("Enter key\n");        ──→  Here the user
    scanf("%d", &key);                      Enters 5 :-
    Pos = linSearch (A, S, key);  ── The key
                      ↑   ↑
                    Name Size   used to stop
    if (Pos == -1)                searching
        printf("No such key");
    else
        printf("%d is at position %d", key, pos);

    .
    .
}
int lnSearch (int B[], int n, int k)
{
    int i;
    for (i=0; i<n; i++)
        if (B[i] == k)
            return i;
    return -1;
}
```

Bubble sort :-

To order elements of an Array :-

You will need two loops

1	2	3	7
0	1	2	3

```
void sort (int A[], int n)
  for (i=0; i<n-1; i++)
    if (A[J] > A[j+1])
    {
        temp = A[J]
        A[J] = A[J+1]
        A[J+1] = temp
    }
```

Arrays with Charachters :-

```
char letter [6] = { 'a', 'u', 'i'.... }
    printf ("Enter a Word")
    for (i=0; i<n; i++)
        scanf ("%c", &letter[i]).
```
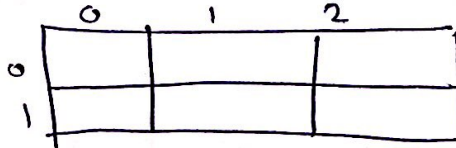
• Multi dimensional Arrays :-

→ 2 dimensional Arrays :-

int B[ ][ ];

Rows   Columns

Exp: B[2] [3];

⟿ How to enter elements

1- you have to define number of Rows and Columns

2- you have to use two loops (one for the rows and one for the columns)

```
#include <stdio.h>
#define R   2
#define C   3
int main ( )
{
int A[R][C];
int i , j ;
for (i=0; i<R; i++)
   for (j=0; j<c; j++)
      {
Printf("Enter value");
Scanf ("%d", &A[i][j]);
```

How to Sum Columns or Rows of An Array:-

i

```
int sum[C] = {0};
for (i = 0; i < R; i++)
   for (j = 0; j < C; j++)
      sum[j] += A[i][j];
```

```
int sum[R] = {0};
for (i = 0; i < R; i++)
   for (j = 0; j < C; j++)
      sum[i] += A[i][j];
```

or Avg :-

$$Avg[i] = Sum[i] / (number\ of\ elements)$$