Built in and User defined data structures

Built in or primitive Data structure :-

primitive Data structures are those data types which cannot be further divided eg

A Date which is composed of DD, MM, YY so it cannot be a primitive Data types.

Integer, Real(Float), Booleans, Characters

They are our built in and primitive data types.

Operations which can be applied on them

Int = Addition, Substraction and other Mathematical operation.

$+, -, *, /, \%$

→ Elementary Data structure

A variable is the most fundamental data structure available to a programmer.

$$A = B+8;$$

A → New value

= → assignment operator

B+8 → old value

It can be used as a basic building block to construct more complex data structure.

Computer Science Lectures By ER. Deepak Garg

ARRAYs.

In C language if user want to store marks of 100 students so he has to declare 100 variable individually but this process is more tedious and impracticable.

This kind of problem can be handled in C with arrays.

Array is a collection of data of same type of variable which is referenced by a common name.

Arrays are of 2 types

→ One dimension Arrays
→ Multi dimensional Arrays

Declaration of One dimensional Array
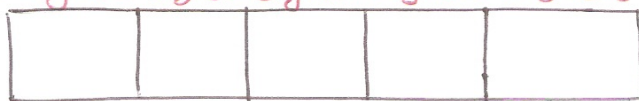
data_type array_name[array_size];

for example
int age[5];

In this Name of the array is age and size of the array is 5 i·e there are 5 items (elements) of array age. And all elements in an array are of the same size and same type.
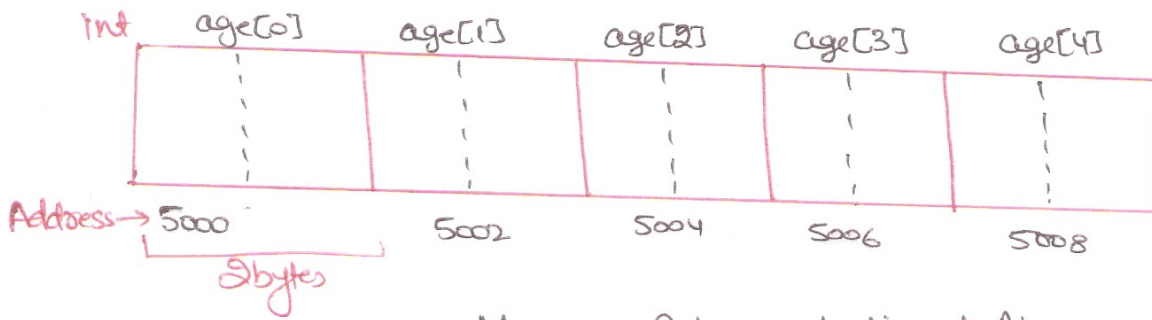
Array elements

Size of array defines the number of elements in an array. and each element can be accessed according to requirement.

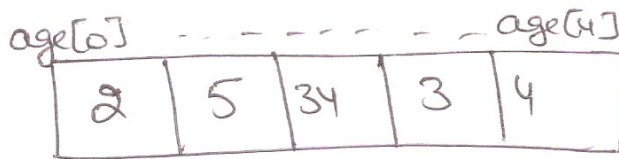int age [5] age[0] age[1] age[2] age[3] age[4]

Array Element

Note that, the first element is numbered 0 and so on.

int | age[0] | age[1] | age[2] | age[3] | age[4]

Address → 5000   5002   5004   5006   5008

2 bytes

Memory Representation of Array

Initialization of one-dimensional Array :-

$$int\ age[5] = \{2,5,34,3,4\};$$

age[0] - - - - - - - - - - age[4]

2	5	34	3	4

Program

```c
#include<stdio.h>
void main()
{ int marks[10],i,n,Sum=0;
  printf(" Enter number of Students: ");
  scanf("%d",&n);
  for( i=0; i<n; ++i)
    { printf( "Enter the marks of Students %d:", i+1);
      scanf("%d, & marks[i]);
      Sum= Sum+ marks[i];
    }
  printf ("Sum =%d",Sum);
}
```

Enter the no. of Students: 3
Enter the marks of Student#1: 15
Enter the marks of student 2: 20
Enter the marks of Student 3: 10
    Sum = 45