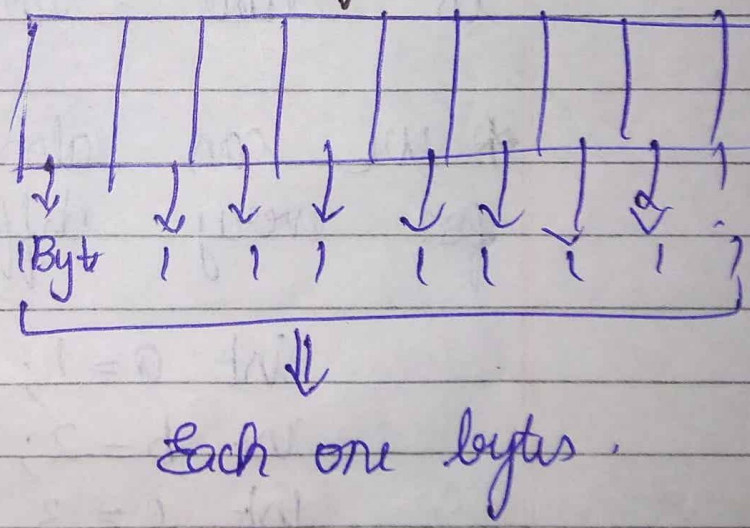
C_46 ⇒ Arrays in C – Part 1

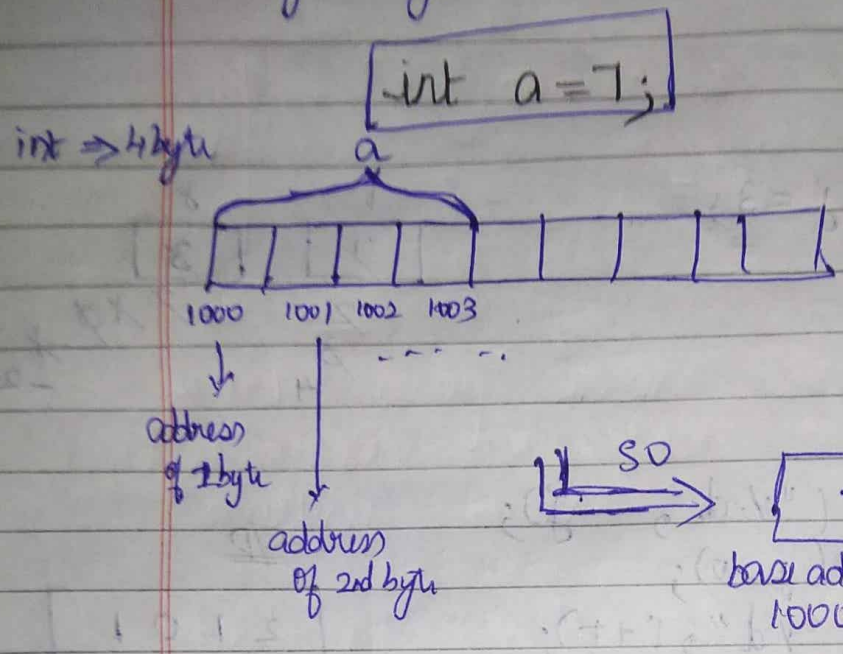
Introduction to Arrays

Computer Memory ⇒ 

Each one bytes.

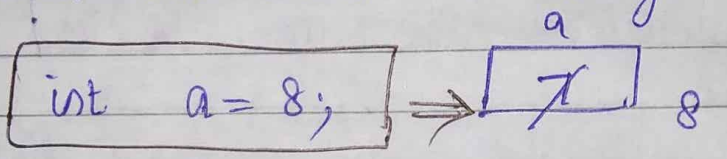
∴ So we have bytes of memory.

* Suppose we declare and initialize integer type variable. int a = 7



Byte of int depends upon machine
2 bytes ⇒ 16 bit
4 bytes ⇒ 32 bit

* when we want to assign 8 in a



→ Instead of 7, 8 is assigned.

* When I want to store 60 values in same variable, we use array.

* We can also use different variables for every different values like,

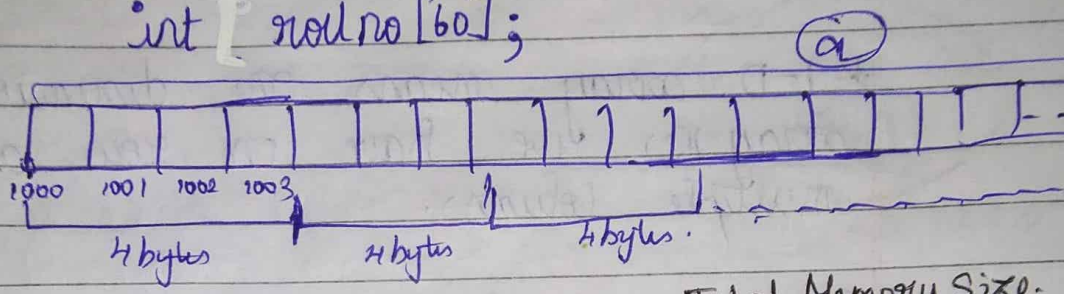
```
int a = 1;
int b = 2;
int c = 3
 :
 :
int abc = 60;
```

⇒ This is more time & more space and more complex.

* So, under one variable name we can store more than one values or datas then means we use arrays.

* Example: To store Roll numbers 1-60 is a single variable.

```
int rollno[60];
```

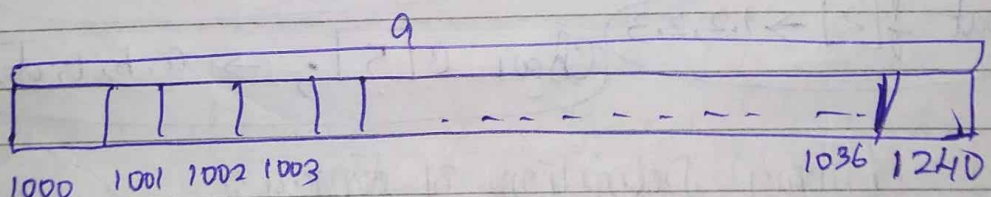


4byte = 1 value.
? = 60 values

Total Memory Size.
No. of elements X Size of (int)

60 values ⇒ 240 bytes

* Hence 60 values, are stored in 4 bytes each in a consecutive manner.



Base address ⇒ 1000
+240 bytes
End address ⇒ 1240

* First address is 1000 and last address is 1240.

syntax of array [1-D array]

```
Datatype  name of array [size of array];
int  a[5];
```

* 1-D array means one dimensional array (ie) we have one row and multiple columns.

Constraint of Arrays:

* All the values of array should be stored only in same type

Eg: integer means all values should be int

int a[5]; → 1, 2, 3, 4, 5

float f[2] → 1.2, 2.3

Char c[5]; → a, b, c, d, e

Proper Definition of Array:

Array is a collection of homogenious data items which are stored in continuous memory location.

Compiler Error:

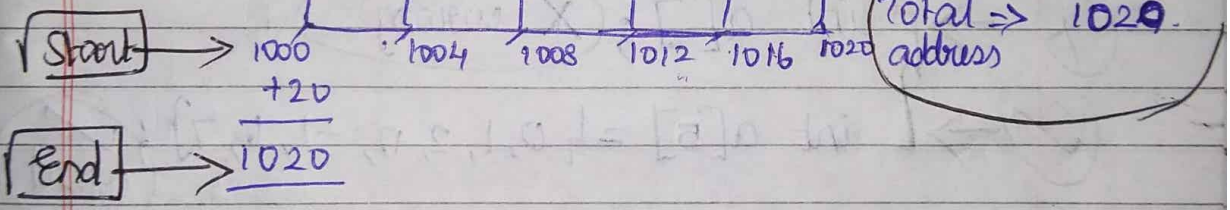
* int a[ ]; ✗ → (array size) should have size
* int a[-5]; ✗ → (array size) must only be +ve.

Array declaration Types:-

* int a[2+2];
* int a[3*2];
* int a[b = 10/2]; ✗

int n;
int a[n]; ✗
But use macro.

Eg:- int a[5]; [5×4 = 20 bytes]



Start → 1000
+20
End → 1020

Macro definition of arrays: (Program with MACRO)

```
# define A 5;
main();
{
int a[A];
}
```

(macro name, macro value, correct)