2D Array : It's a collection of 1D arrays, which are in contigious memory locations.

Syntax : Datatype arry[row][col] ;

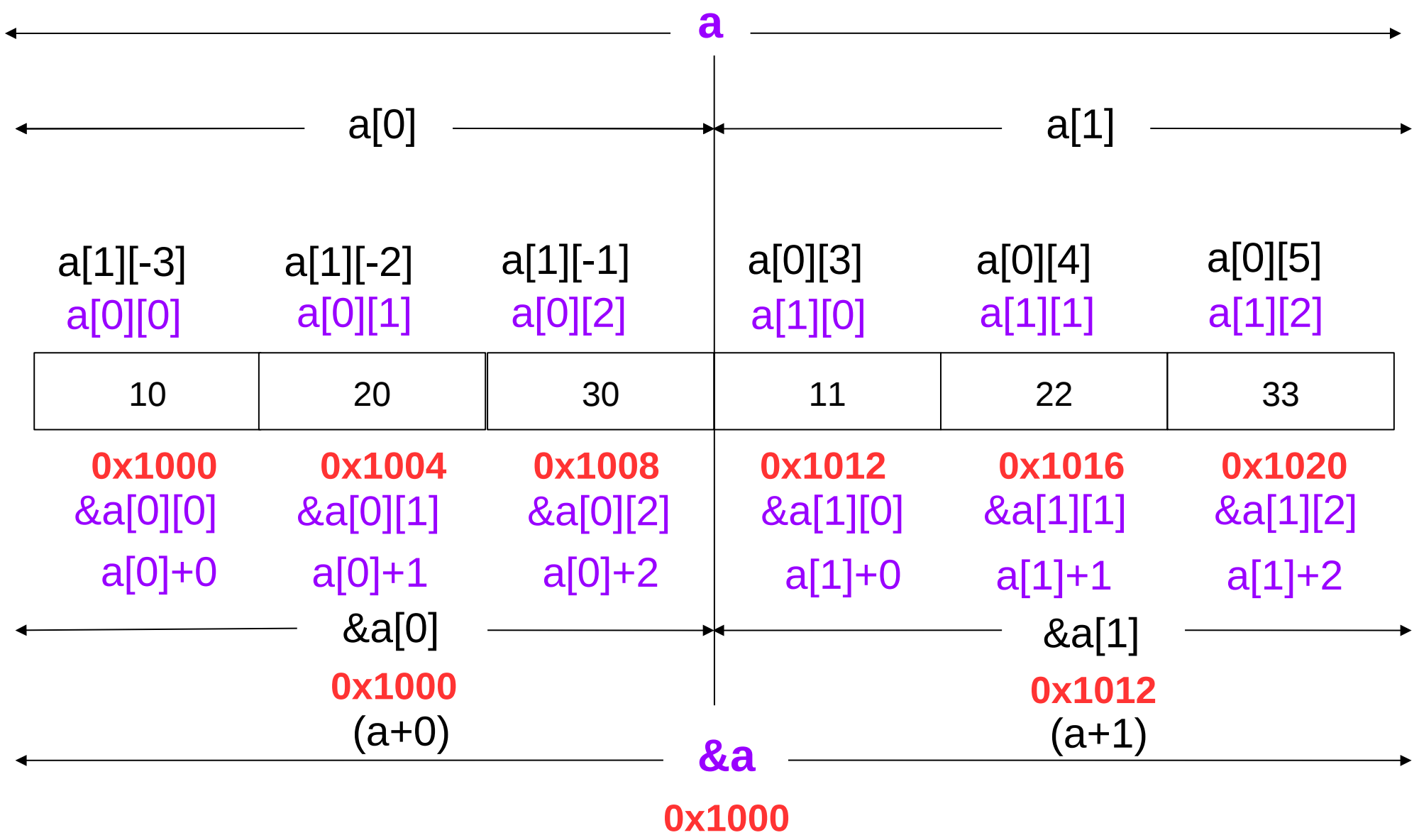
row ⟶ no.of 1D arrays

col ⟶ no.of elements in each 1D array

Ex : int a[2][3]; ⟶ 2 – 1D arrays

3 elements in each 1D array

int a[2][3] = { {10,20,30}, {11,22,33} };



```
1 #include<stdio.h>
2 int main()
3 {
4         int i,j;
5         //int a[2][3] = { {10,20,30}, {11,22,33} };
6         //int a[2][3] = {10,20,30,11,22,33};
7         //int a[2][3] = {10,20,30,11,22};
8         int a[2][3] = { {10,20},{11,22}};
9
10         for(i=0;i<2;i++)
11         {
12                 for(j=0;j<3;j++)
13                 printf("%d ",a[i][j]);
14                 printf("\n");
15         }
16 }
```

```
1 #include<stdio.h>
 2 int main()
 3 {
 4         int i,j,r,c;
 5         //int a[][3] = { {10,20,30}, {11,22,33} };
 6         int a[][3] = { 10,20,30,11,22,33 };
 7         //int a[2][] = { {10,20,30}, {11,22,33} }; //error
 8
 9          r = sizeof a/sizeof a[0];
10          c = sizeof a[0]/sizeof a[0][0];
11          for(i=0;i<r;i++)
12          {
13                  for(j=0;j<c;j++)
14                  printf("%d ",a[i][j]);
15                  printf("\n");
16          }
17 }
```

a[0] --> *(a+0) --> *a

&a[0] --> &*(a+0) --> a+0 --> a

&a[1] --> &*(a+1) --> a+1

a[0][0] --> *(a[0]+0) --> *a[0] --> *(*(a+0)) --> **a

&a[0][0] --> &*(a[0]+0) --> a[0]+0 --> a[0]

a[1][2] --> *(a[1]+2) --> *((*(a+1)) +2)

&a --> Base addr;

&a+1--> Base addr + sizeof a;

a --> Base addr

a+1 --> Base addr + sizeof a[0];

a[0] --> Base addr;

a[0]+1--> Base addr + sizeof a[0][0];

a[0][0] --> 1st value of 1st 1D-array

a[0][0]+1 --> value + 1;

```
1 #include<stdio.h>
2 int main()
3 {
4         int a[2][3] = { {10,20,30},{11,22,33} };
5         int r,c,ele;
6         printf("sizeof a : %d\n",sizeof a);
7         printf("sizeof a[0] : %d\n",sizeof a[0]);
8         printf("sizeof a[0][0] : %d\n",sizeof a[0][0]);
9         r = sizeof a/sizeof a[0];
10         c = sizeof a[0]/sizeof a[0][0];
11         ele = r*c;
12         printf("r = %d c = %d ele = %d\n",r,c,ele);
13 }
```

```
1 #include<stdio.h>
2 int main()
3 {
4         int a[2][3] = { {10,20,30},{11,22,33} };
5         printf("&a   = %u\n",(unsigned)&a);
6         printf("&a+1 = %u\n",(unsigned)(&a+1));
7
8         printf("a   = %u\n",(unsigned)a);
9         printf("a+1 = %u\n",(unsigned)(a+1));
10
11         printf("a[0] = %u\n",(unsigned)a[0]);
12         printf("a[0]+1 = %u\n",(unsigned)(a[0]+1));
13
14         printf("a[0][0] = %d\n",a[0][0]);
15         printf("a[0][0]+1 = %d\n",a[0][0]+1);
16 }
```