3D - Array

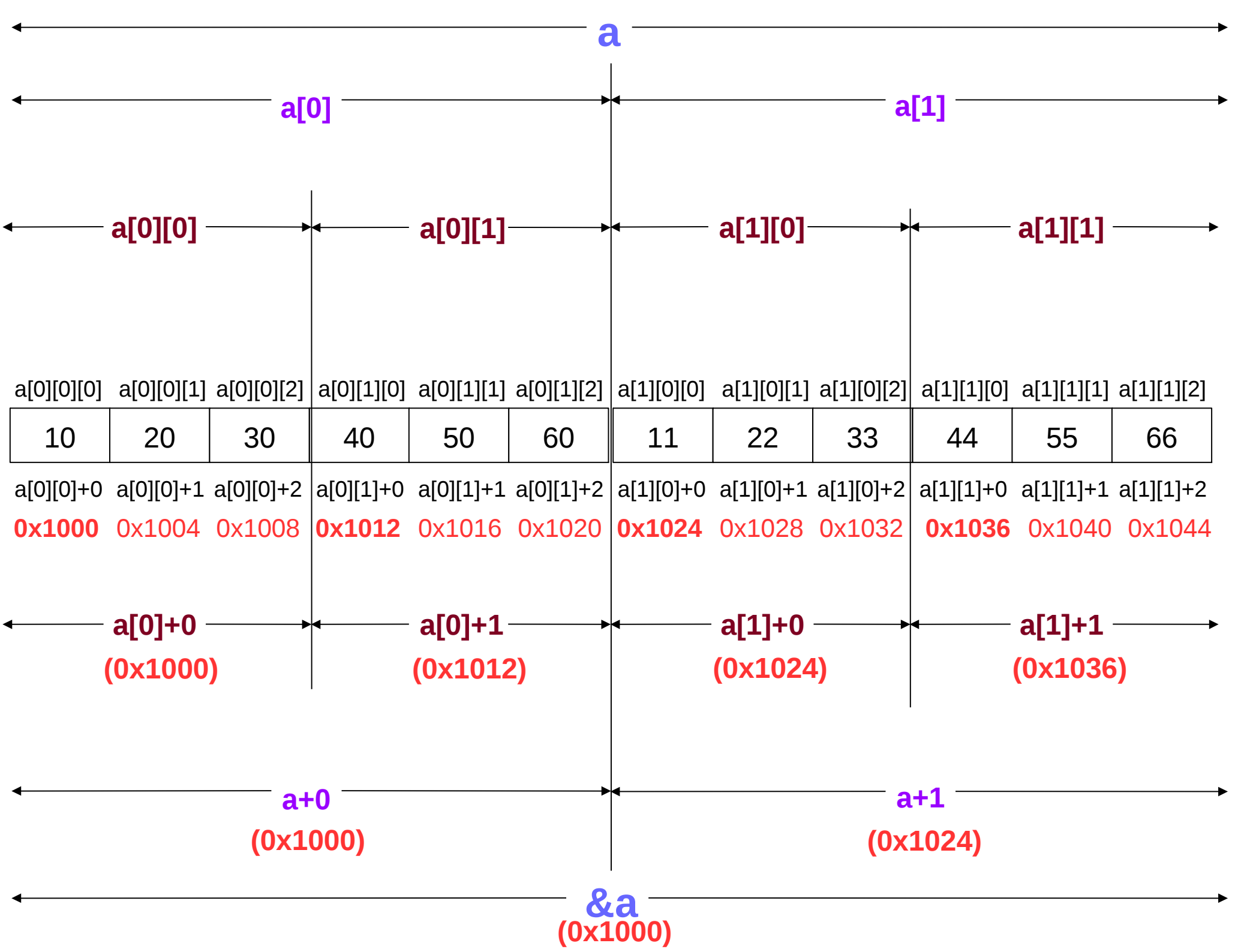
It's a collection of 2D-arrays.

Syntax : Datatype arr[row1][row2][col];

row1 ---> no.of 2D arrays.
row2 ---> no.of 1D arrays in each 2D array.
col ---> no.of elements in each 1D array.

Ex : int a[2][2][3] = { { {10,20,30},{40,50,60} }, { {11,22,33}, {44,55,66} } };

2 - 2D arrays
2 - 1D arrays in each 2D array
3 - elements in each 1D array


a
a[0]
a[1]
a[0][0]
a[0][1]
a[1][0]
a[1][1]
a[0][0][0] a[0][0][1] a[0][0][2] a[0][1][0] a[0][1][1] a[0][1][2] a[1][0][0] a[1][0][1] a[1][0][2] a[1][1][0] a[1][1][1] a[1][1][2]
10 20 30 40 50 60 11 22 33 44 55 66
a[0][0]+0 a[0][0]+1 a[0][0]+2 a[0][1]+0 a[0][1]+1 a[0][1]+2 a[1][0]+0 a[1][0]+1 a[1][0]+2 a[1][1]+0 a[1][1]+1 a[1][1]+2
0x1000 0x1004 0x1008 0x1012 0x1016 0x1020 0x1024 0x1028 0x1032 0x1036 0x1040 0x1044
a[0]+0
(0x1000)
a[0]+1
(0x1012)
a[1]+0
(0x1024)
a[1]+1
(0x1036)
a+0
(0x1000)
a+1
(0x1024)
&a
(0x1000)

a[i][j][k] ---> *(a[i][j] + k)

---> *(*(a[i]+j) + k)

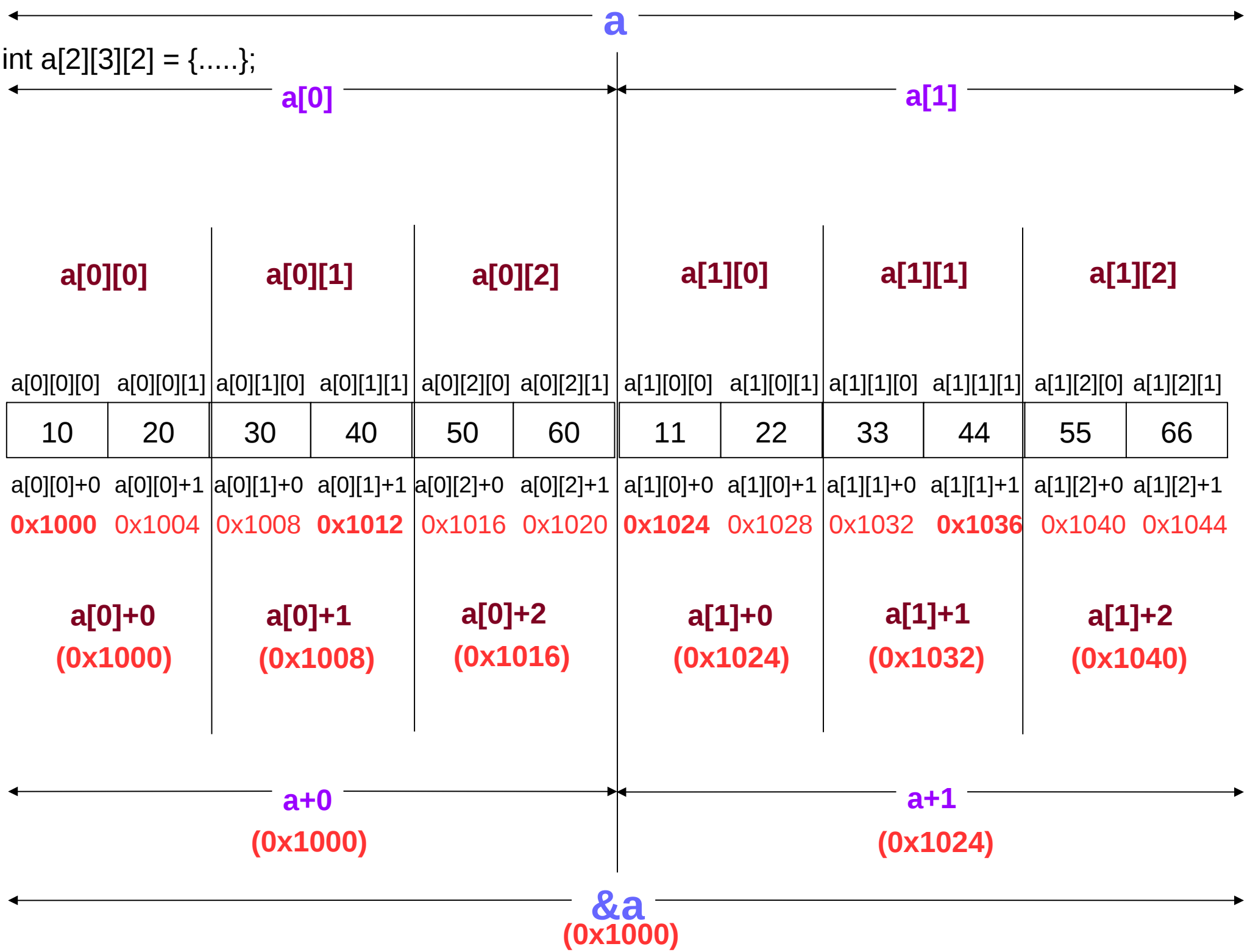
---> *(*(*(a+i) + j) + k)

&a[i][j][k] ---> &*(a[i][j] + k)

---> a[i][j] + k

&a[i][j] ----> &*(a[i] + j) ---> a[i] + j;

1. sizeof a	----	row1*row2*col*sizeof(a[0][0][0]);
2. sizeof a[0]	----	row2*col*sizeof(a[0][0][0]);
3. sizeof a[0][0]	----	col*sizeof(a[0][0][0]);
4. sizeof a[0][0][0]	----	sizeof(datatype);
5. row1	----	sizeof a/sizeof a[0];
6. row2	----	sizeof a[0]/sizeof a[0][0];
7. col	----	sizeof a[0][0]/sizeof a[0][0][0];
8. a	----	Base addr (0x1000)
9. a+1	----	Base addr + sizeof a[0]; (0x1024)
10. &a	----	Base addr; (0x1000)
11. &a+1	----	Base addr + sizeof a; (0x1048)
12. a[0]	----	Base addr (0x1000)
13. a[0]+1	----	Base addr + sizeof a[0][0]; (0x1012)
14. a[0][0]	----	Base addr (0x1000)
15. a[0][0]+1	----	Base addr + sizeof a[0][0][0]; (0x1004)
16. a[0][0][0]	----	value of 1st 1D array of 1st 2D array(10);
17. a[0][0][0]+1	----	value+1;


a
int a[2][3][2] = {.....};
a[0]
a[1]
a[0][0]
a[0][1]
a[0][2]
a[1][0]
a[1][1]
a[1][2]
a[0][0][0] a[0][0][1] a[0][1][0] a[0][1][1] a[0][2][0] a[0][2][1] a[1][0][0] a[1][0][1] a[1][1][0] a[1][1][1] a[1][2][0] a[1][2][1]
10 20 30 40 50 60 11 22 33 44 55 66
a[0][0]+0 a[0][0]+1 a[0][1]+0 a[0][1]+1 a[0][2]+0 a[0][2]+1 a[1][0]+0 a[1][0]+1 a[1][1]+0 a[1][1]+1 a[1][2]+0 a[1][2]+1
0x1000 0x1004 0x1008 0x1012 0x1016 0x1020 0x1024 0x1028 0x1032 0x1036 0x1040 0x1044
a[0]+0 (0x1000)
a[0]+1 (0x1008)
a[0]+2 (0x1016)
a[1]+0 (0x1024)
a[1]+1 (0x1032)
a[1]+2 (0x1040)
a+0 (0x1000)
a+1 (0x1024)
&a (0x1000)