Pointers and 2D array

2D array (static)

Memory view

1D array A[0]

1D array A[1]

0,0	0,1	0,2	1,0	1,1	1,2
007CFE5C	007CFE60	007CFE64	007CFE68	007CFE6C	007CFE70
1	***2***	***3***	***4***	***5***	***6***

horizontal view

1D array A[0]

0,0	0,1	0,2
007CFE5C	007CFE60	007CFE64
1	***2***	***3***

Verticle view

1,0	1,1	1,2
007CFE68	007CFE6C	007CFE70
4	***5***	***6***

1D array A[1]

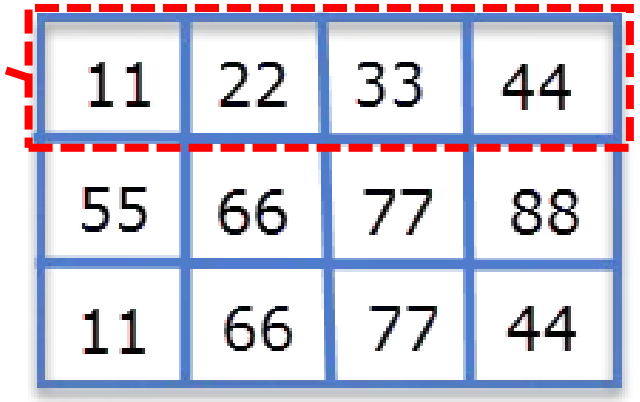
arr →	11	22	33	44
arr + 1 →	55	66	77	88
arr + 2 →	11	66	77	44

2D array (static)

Assigning a pointer to an array

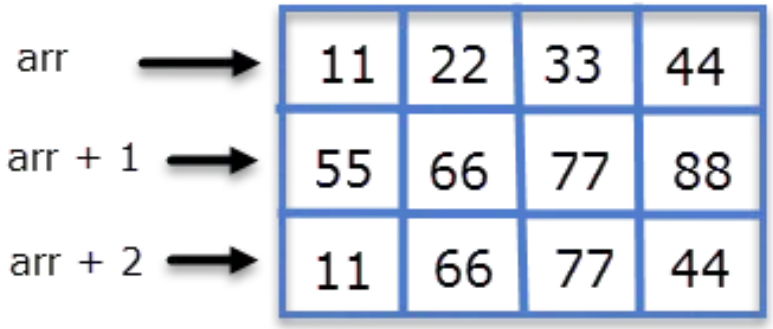
```
int main()
{
    int arr[3][4] = {
    {11,22,33,44},
    {55,66,77,88},
    {11,66,77,44}
    };

    int i, j;
    int(*p)[4];

    p = arr;
    return 0;
}
```

***p[4] : pointer to an array of 4 integers**



2D array (static)

(access content)



Array notation

`arr[i][i]`

`arr[0][2]`

0,0	0,1	0,2
007CFE5C	007CFE60	007CFE64
1	***2***	***3***
1,0	1,1	1,2
007CFE68	007CFE6C	007CFE70
4	***5***	***6***

Pointer notation

((p+i) + j)

((p+0) + 2)

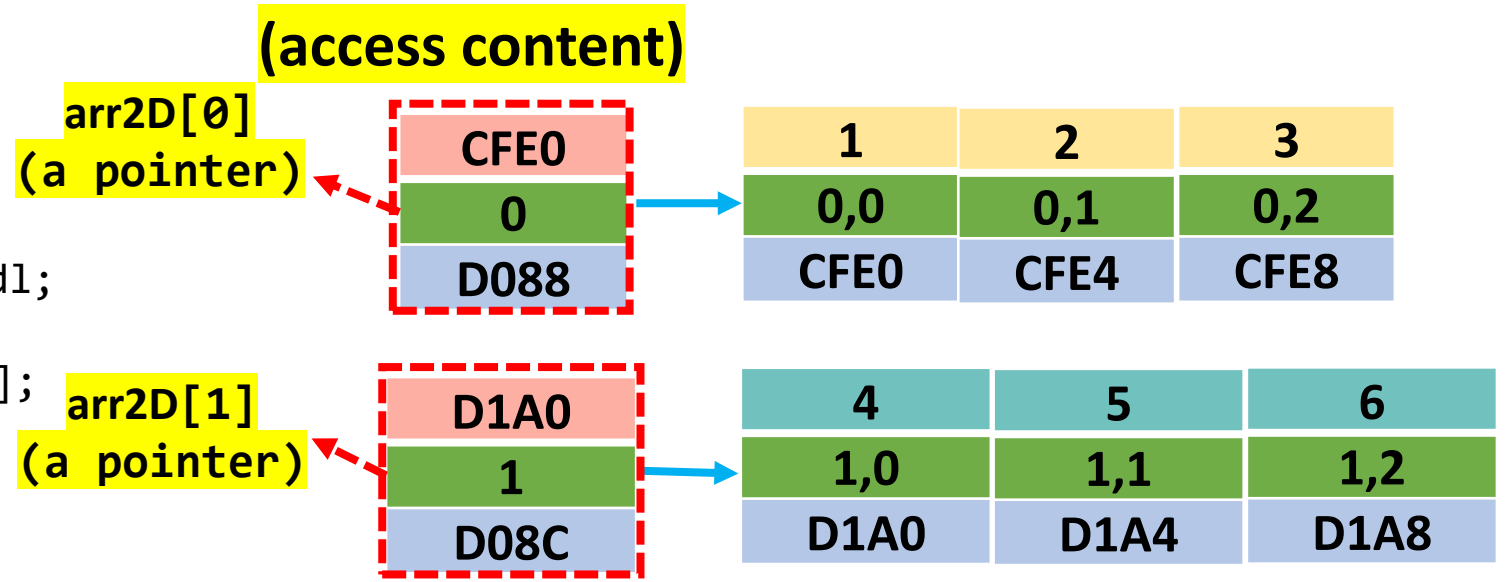
((arr+i) + j)

((arr+0) + 2)

0,0	0,1	0,2
007CFE5C	007CFE60	007CFE64
1	***2***	***3***
1,0	1,1	1,2
007CFE68	007CFE6C	007CFE70
4	***5***	***6***

2D array (dynamic)

```
int **arr2D;
arr2D = new int*[row];
cout << "Enter values: " << endl;
for (int i = 0; i < row; i++)
        arr2D[i] = new int[col];
```



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Array notation

```
arr[i][i]
arr[0][2]
```

Pointer notation

```
*(*(arr+i) + j)
*(*(arr+0) + 2)
```