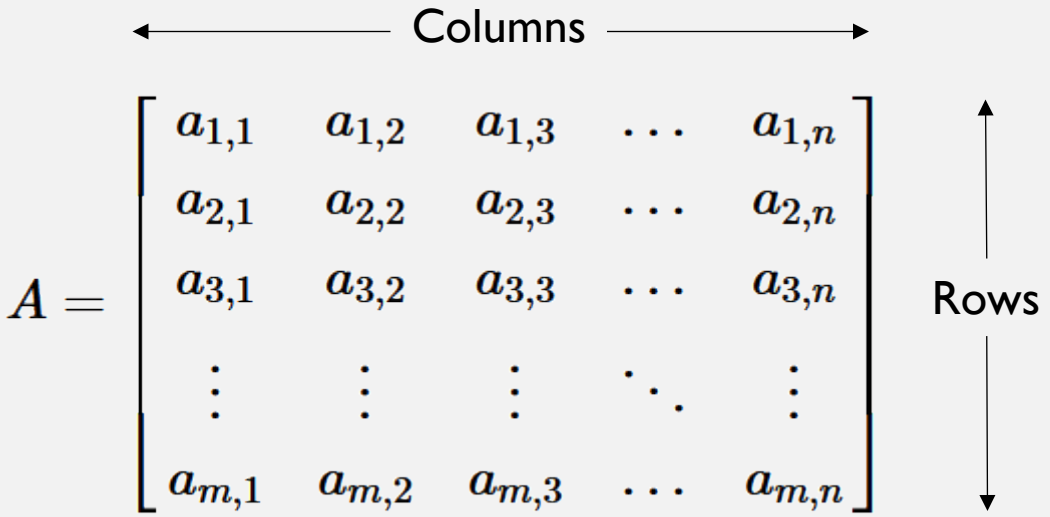
MULTIPLICATION TABLE

`multtab.cpp`

Delroy A. Brinkerhoff

MATRIX: TWO-DIMENSIONAL ARRAY

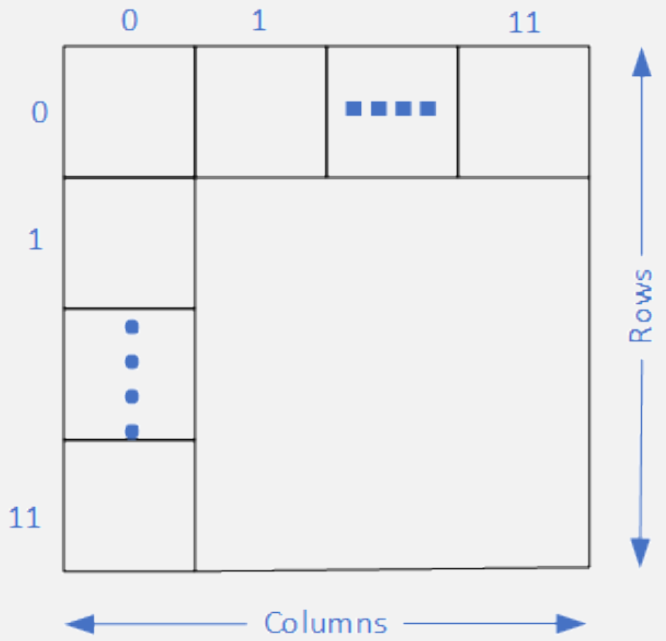


$$A = \begin{bmatrix} a_{1,1} & a_{1,2} & a_{1,3} & \cdots & a_{1,n} \\ a_{2,1} & a_{2,2} & a_{2,3} & \cdots & a_{2,n} \\ a_{3,1} & a_{3,2} & a_{3,3} & \cdots & a_{3,n} \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ a_{m,1} & a_{m,2} & a_{m,3} & \cdots & a_{m,n} \end{bmatrix}$$

$a_{i,j} = a_{row,col}$

TWO-DIMENSIONAL ARRAY

- `int table[12][12];`
- 0-indexed
  - $0 \leq i < 12$
  - $0 \leq j < 12$



FILLING THE TABLE

```
for (int row = 1; row <= 12; row++)
    for (int col = 1; col <= 12; col++)
        table[row - 1][col - 1] = row * col;
```

```
for (int row = 1; row <= 12; row++)
{
    for (int col = 1; col <= 12; col++)
    {
        table[row - 1][col - 1] = row * col;
    }
}
```

PRINTING THE TABLE

```
for (int row = 0; row < 12; row++)
{
    for (int col = 0; col < 12; col++)
        cout << setw(4) << table[row][col];
    cout << endl;
}
```

TWO-DIMENSIONAL ARRAY FUNCTION PARAMETERS

```
#include <iostream>
#include <iomanip>
using namespace std;

void fill_table(int tab[][12]);
void print_table(int tab[][12]);
```

```
int main()
{
    int    table[12][12];

    fill_table(table);
    print_table(table);

    return 0;
}
```

FILLING THE ARRAY WITH A FUNCTION

```
void fill_table(int tab[12][12])
{
    for (int row = 1; row <= 12; row++)
        for (int col = 1; col <= 12; col++)
            tab[row - 1][col - 1] = row * col;
}
```

```
void fill_table(int tab[][12], int nrows)
{
    for (int row = 1; row <= nrows; row++)
        for (int col = 1; col <= 12; col++)
            tab[row - 1][col - 1] = row * col;
}
```

PRINTING THE ARRAY WITH A FUNCTION

```
void print_tab(int tab[][12], int nrows)
{
    for (int row = 0; row < nrows; row++)
    {
        for (int col = 0; col < 12; col++)
            cout << setw(4) << tab[row][col];
        cout << endl;
    }
}
```