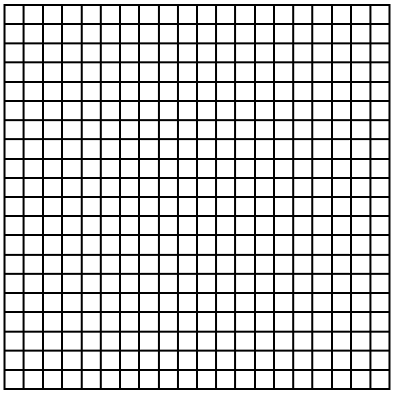
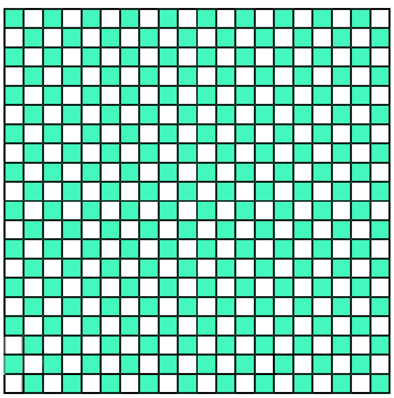
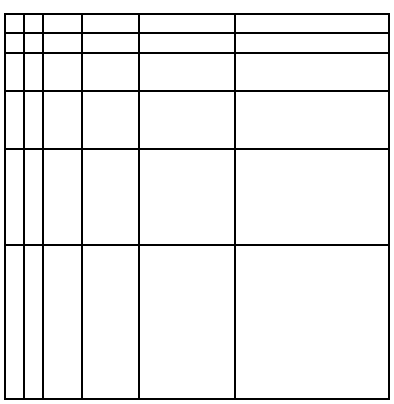
Nonlinear Grid Design, Part 1: Introduction

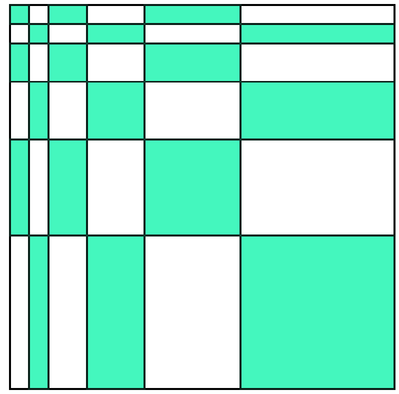
Many design techniques use a linear grid of square cells:



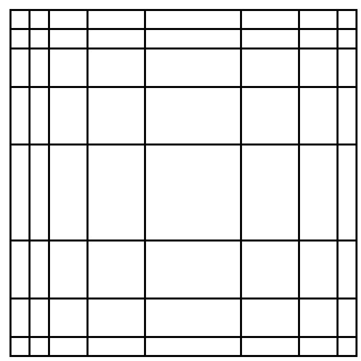


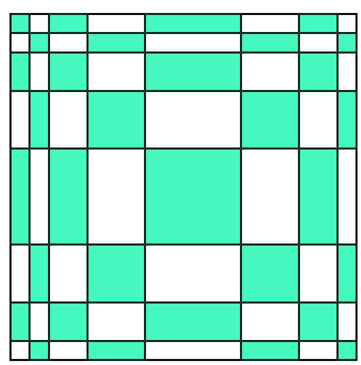
Interesting results can be obtained by using nonlinear grids in which not all cells are square. An example is the Fibonacci grid in which the widths in heights increase according to the Fibonacci sequence: 1, 1, 2, 3, 5, 8, 13, …



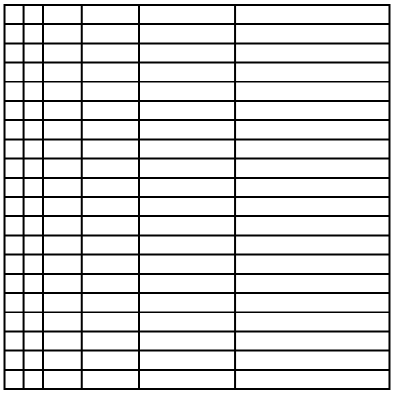


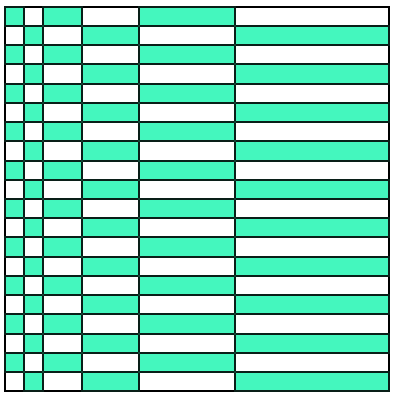
Since the values of the Fibonacci sequence increase rapidly, the cells quickly get too large for interesting designs. An alternative is to take the first few values and then reflect them to get a symmetric grid:





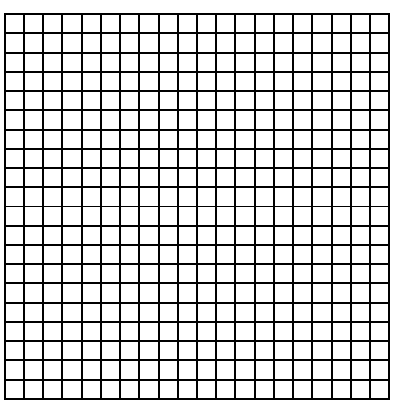
Grids can be characterized by two sequences, one for the widths and the other for the heights, and they need not be the same. For example, the Fibonacci sequence could be used for widths and a constant sequence for heights:



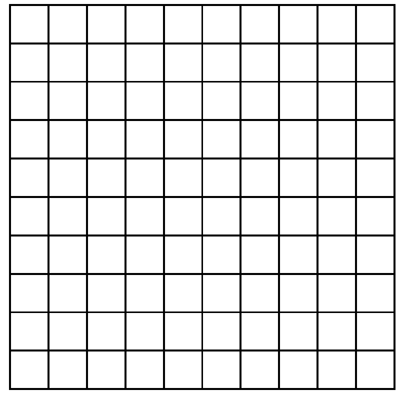


Other aspects of grids are the scaling and resolution: how large a cell actually is. In the grids in this article, the scaling factor is 10 and the resolution is 100 per inch an inch. For example, a width specification of 1 produces a width of 1/10th inch.

Here is a linear grid with a scaling factor of 10 and a resolution of 100:



Changing the scaling factor to 20 produces



The following pages contain grid plots for a variety of sequences and combinations of them. The sequences are labeled as follows:

C	constant	1, 1, 1, …
I	integer	1, 2, 3, …
M	multi-integer	1, 2, 2, 3, 3, 3, 4, 4, 4,4, …
F	Fibonacci	1, 1, 2, 3, 5, 8, …
P	prime	2, 3, 5, 7, 11, …

These are only a few of an unlimited number of possibilities. And it's easy to make your own. Start with linear grid paper and rule off widths and heights according to the sequences you want.

Subsequent articles in this sequence will explore other kinds of nonlinear grids.

Ralph E. Griswold

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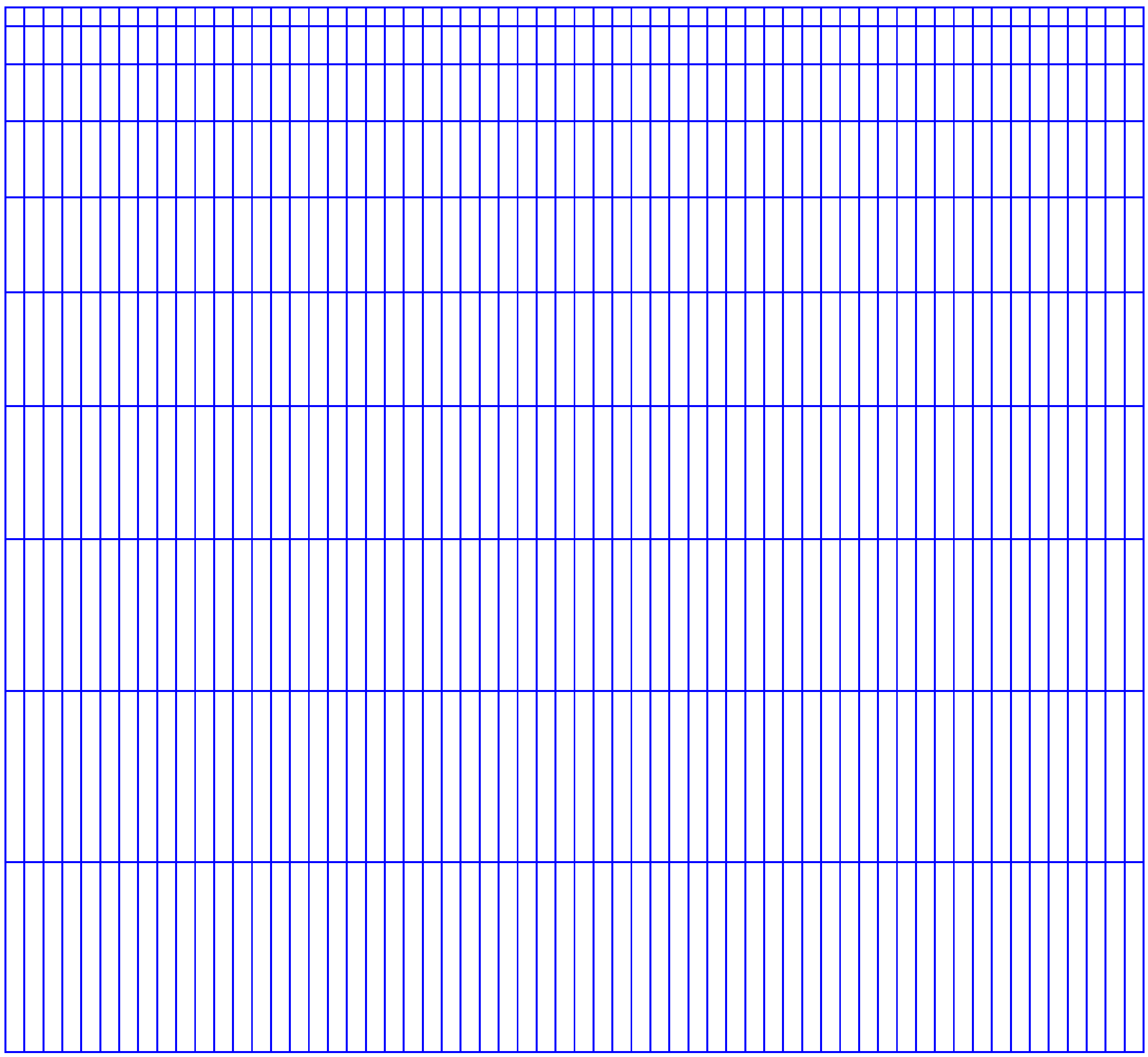
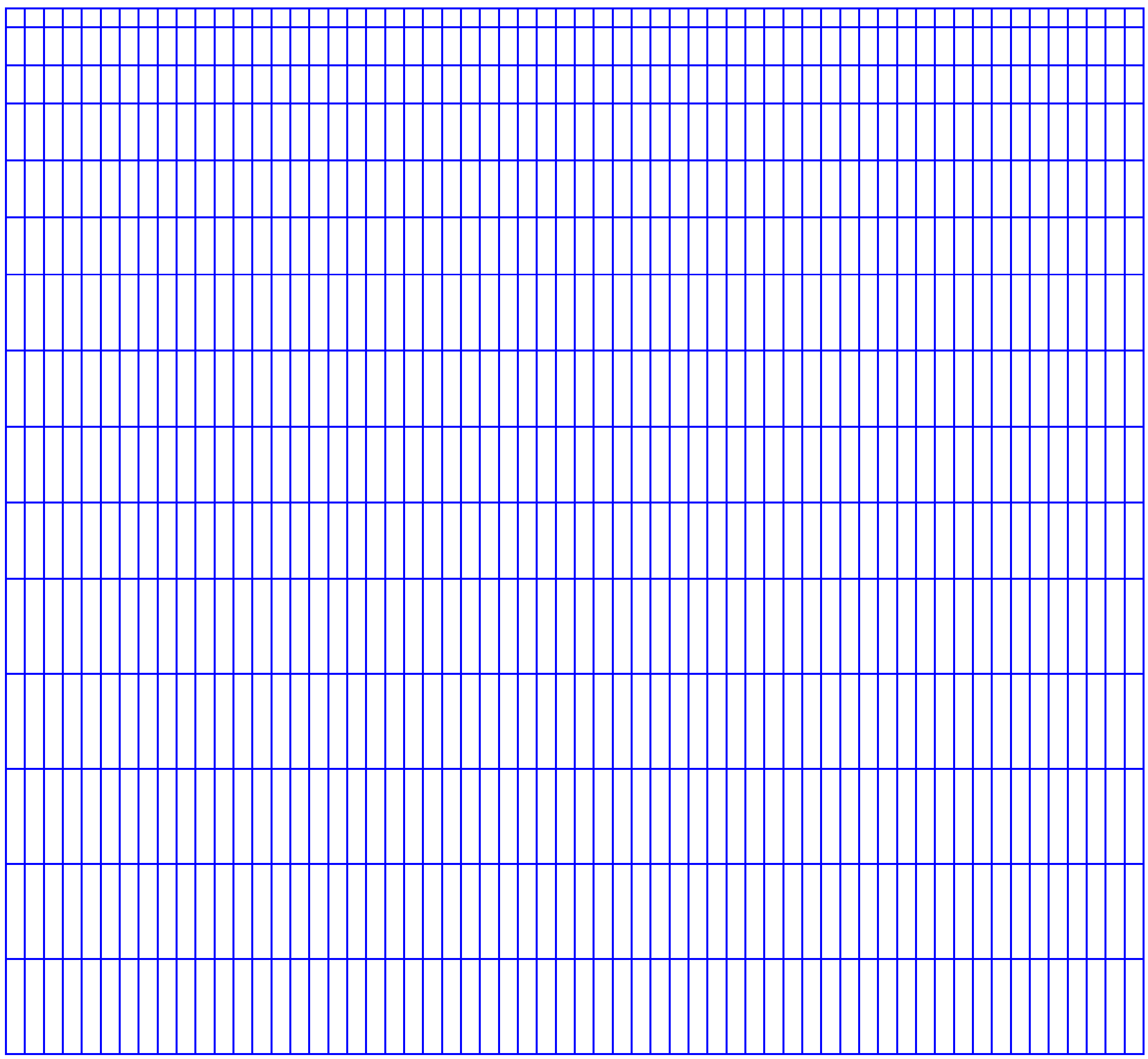
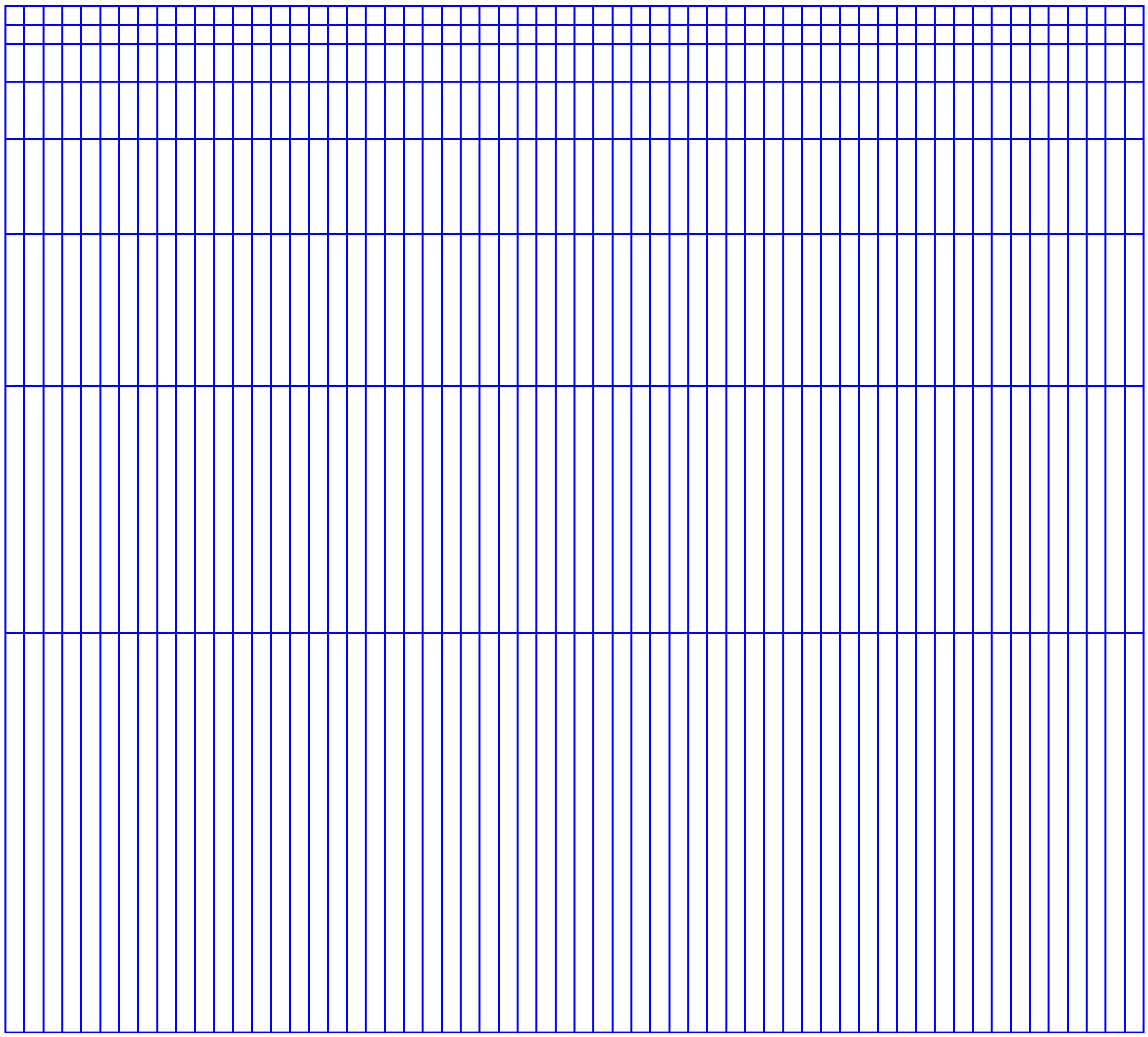


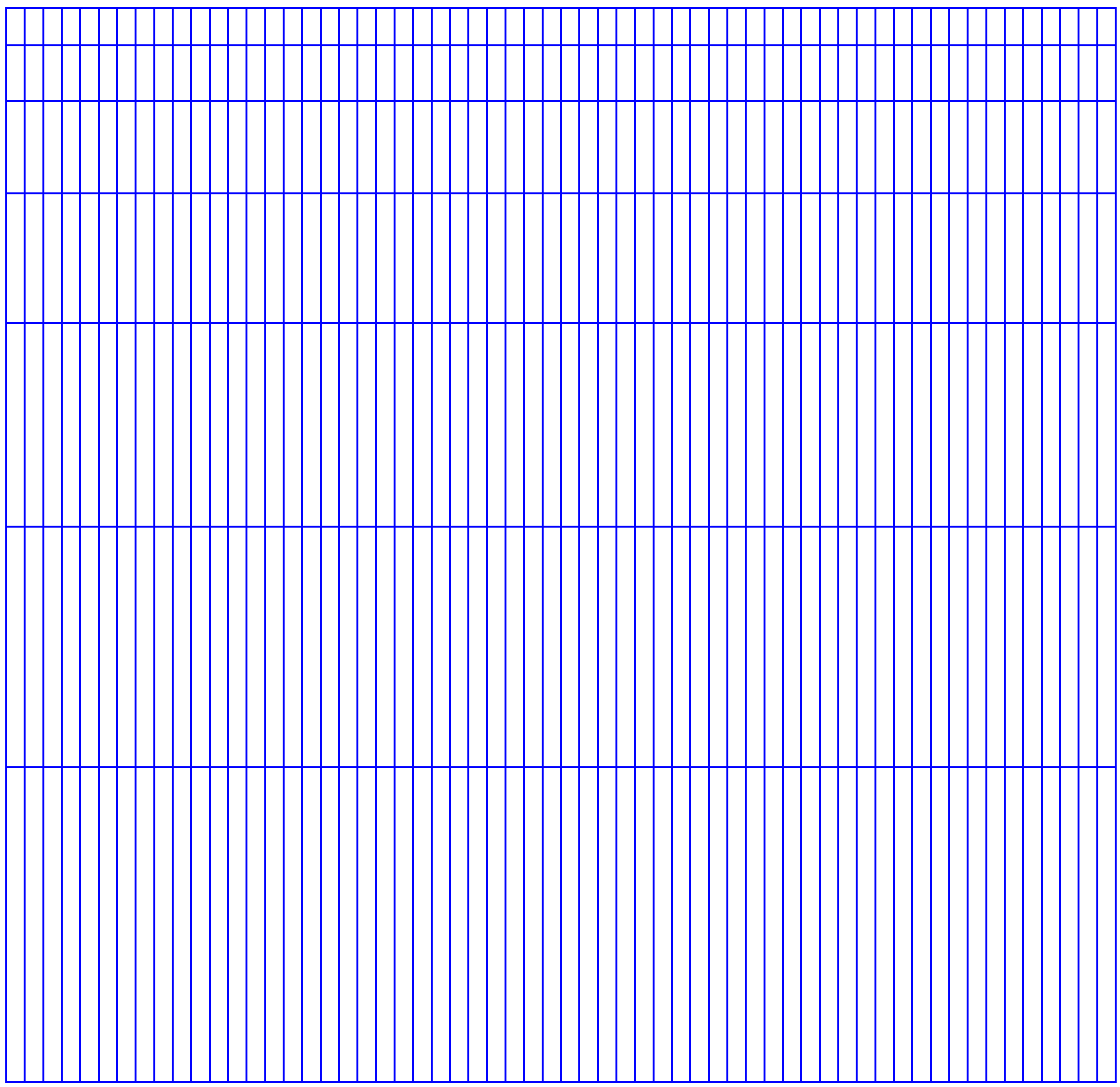
C x I



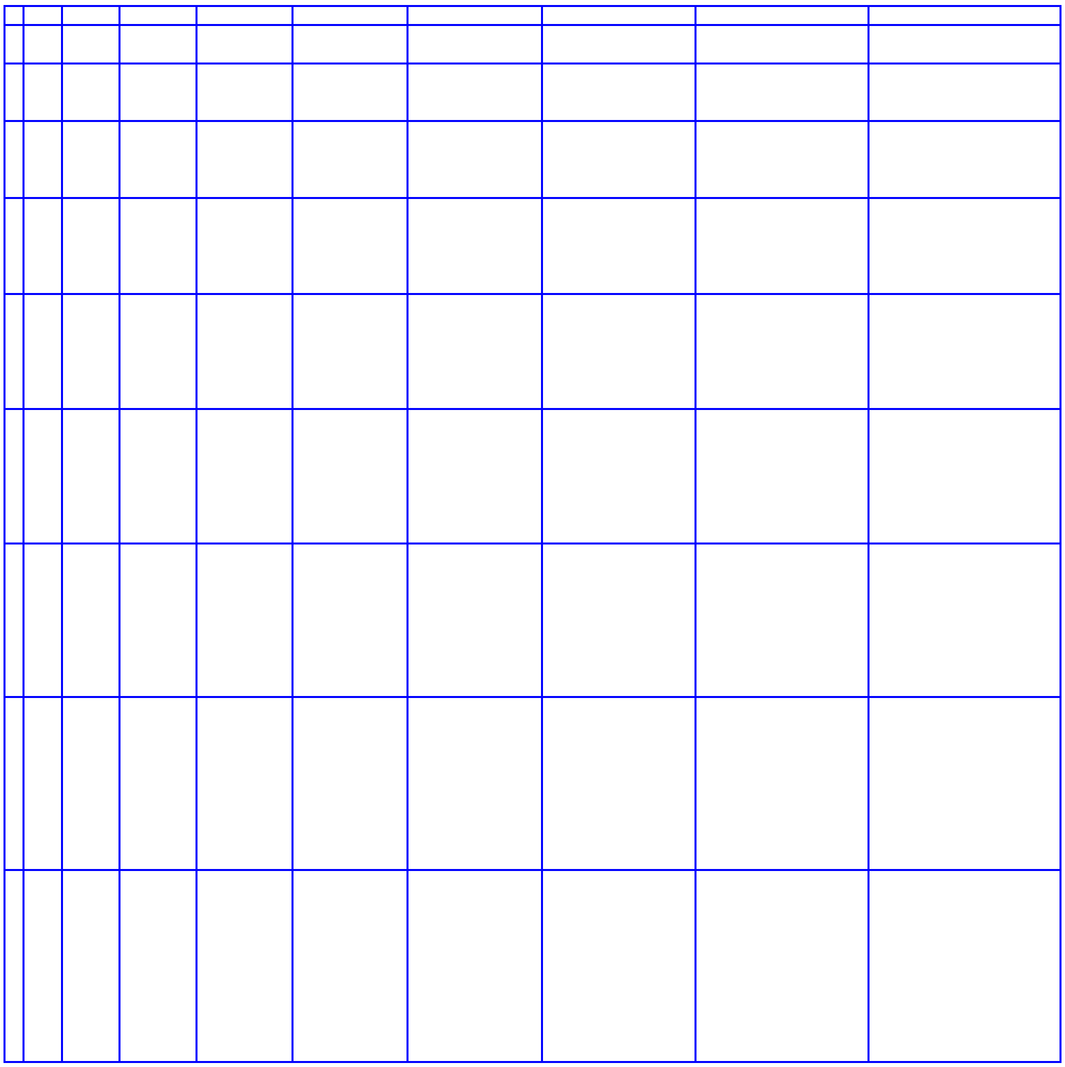
C x M



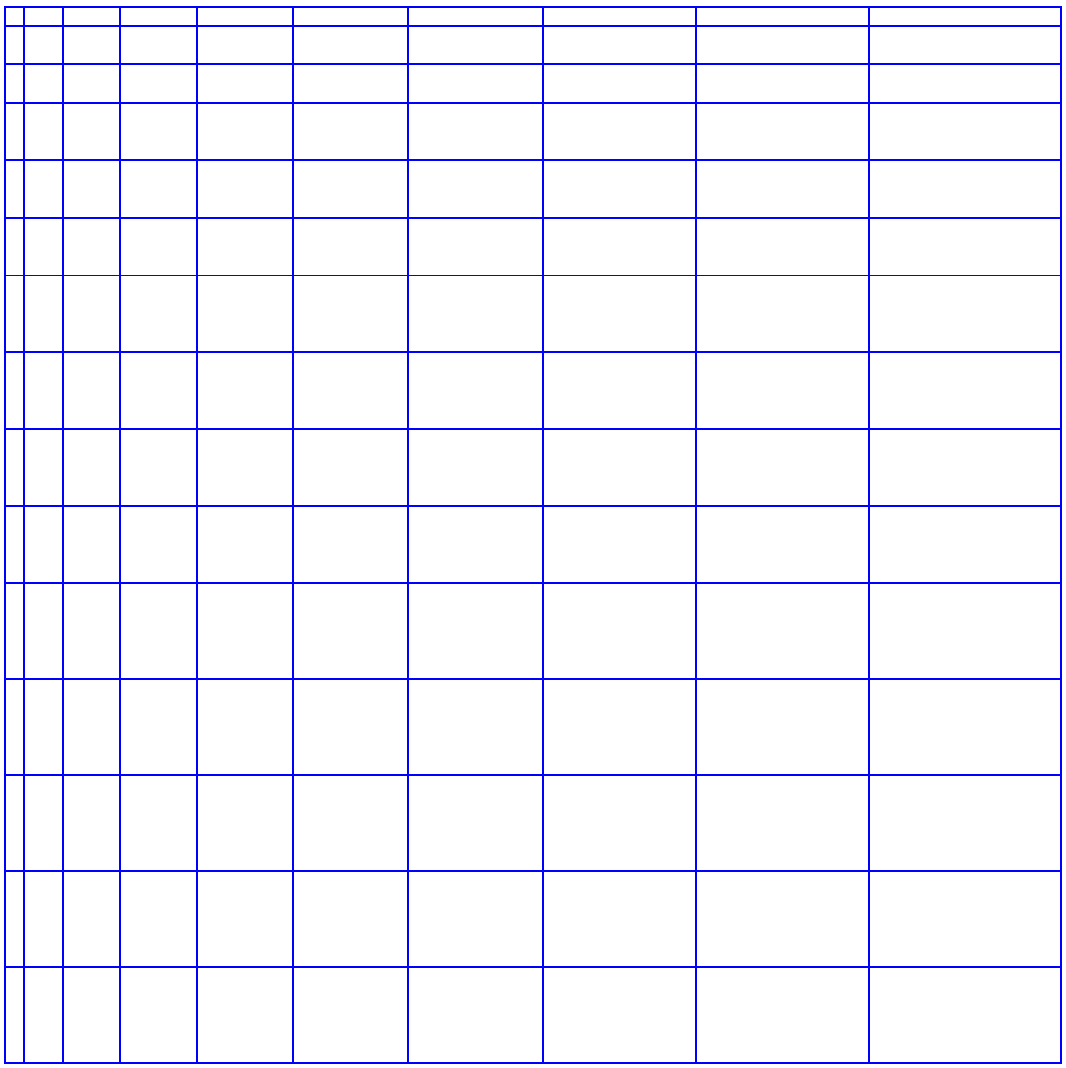
C x F



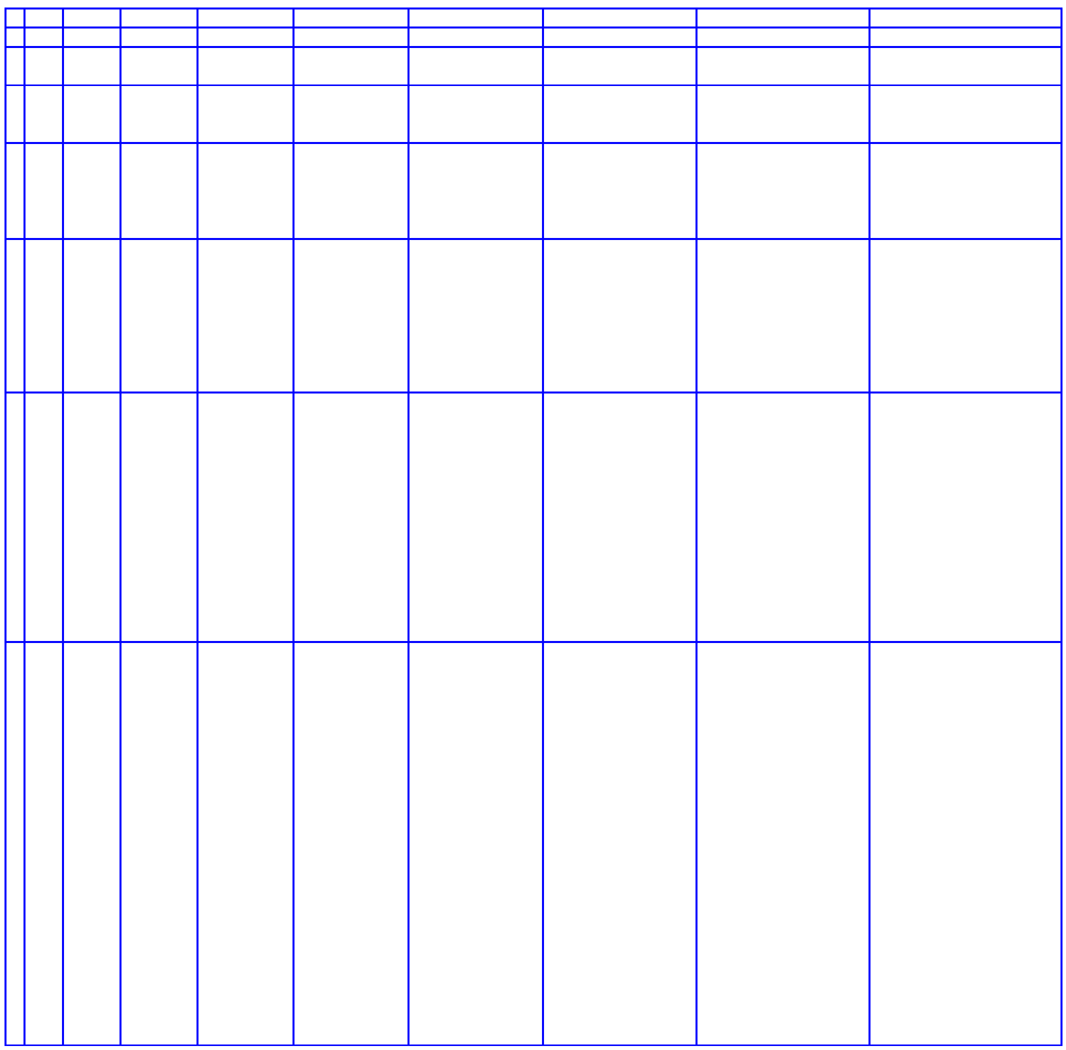
C x P



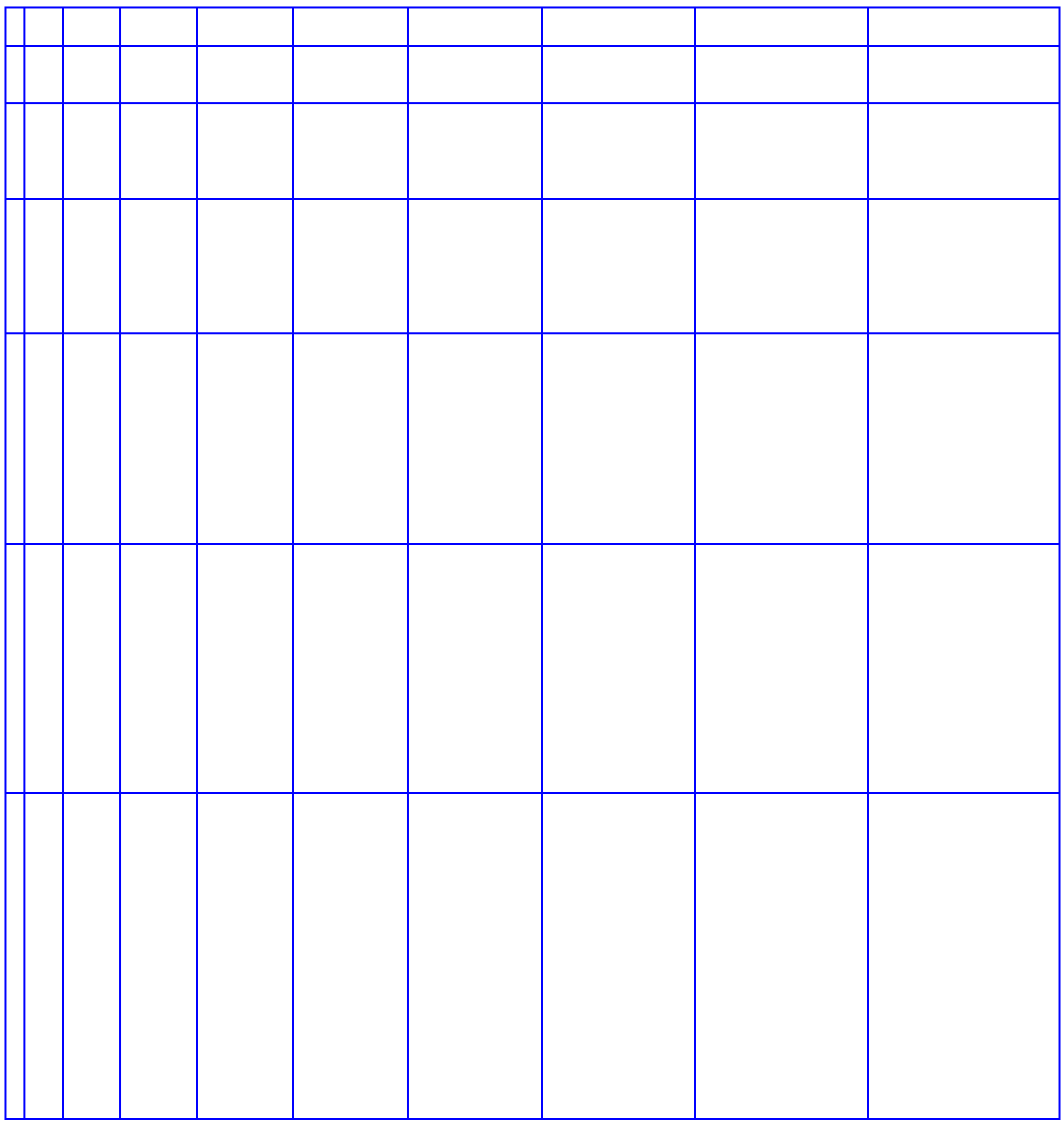
l x l



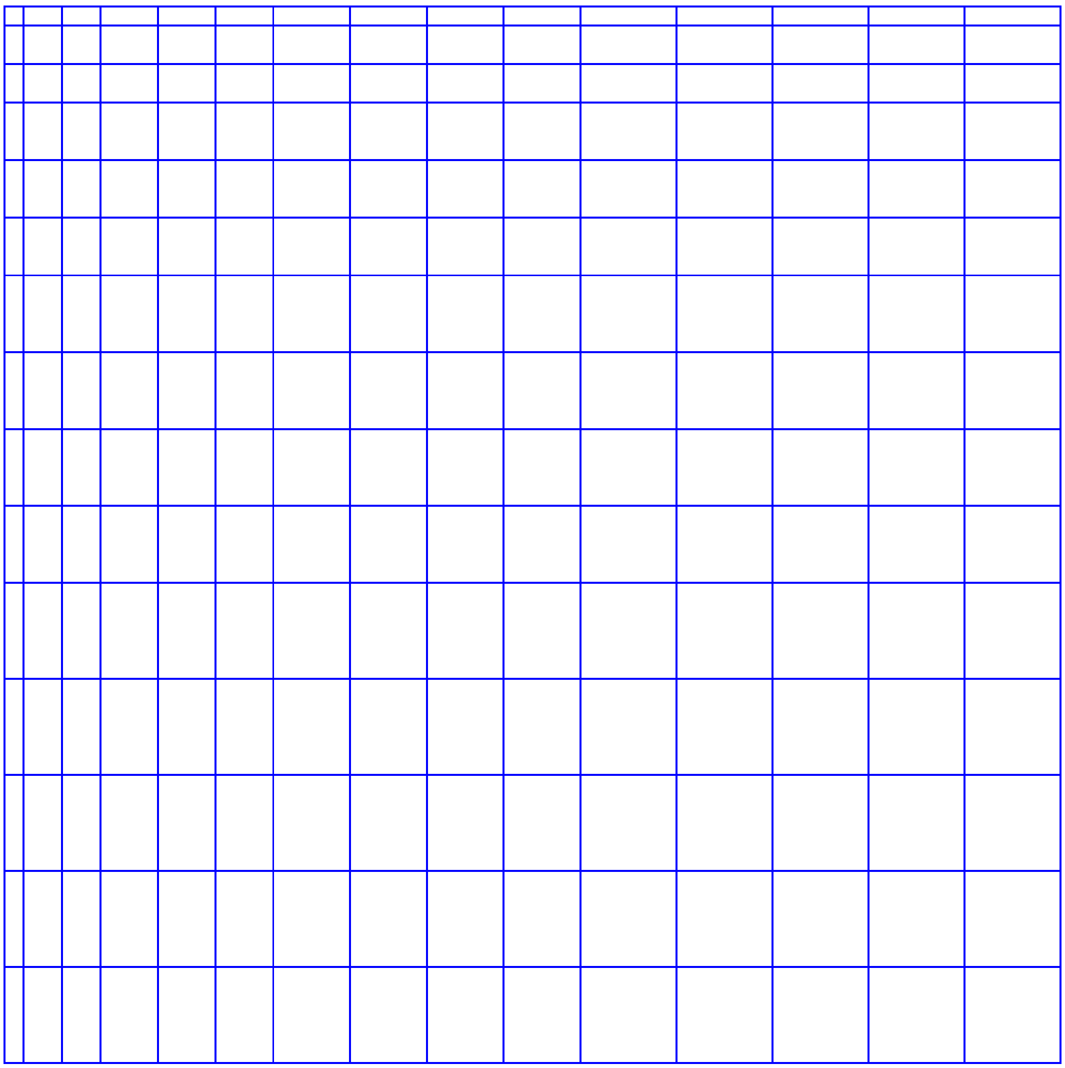
I x M



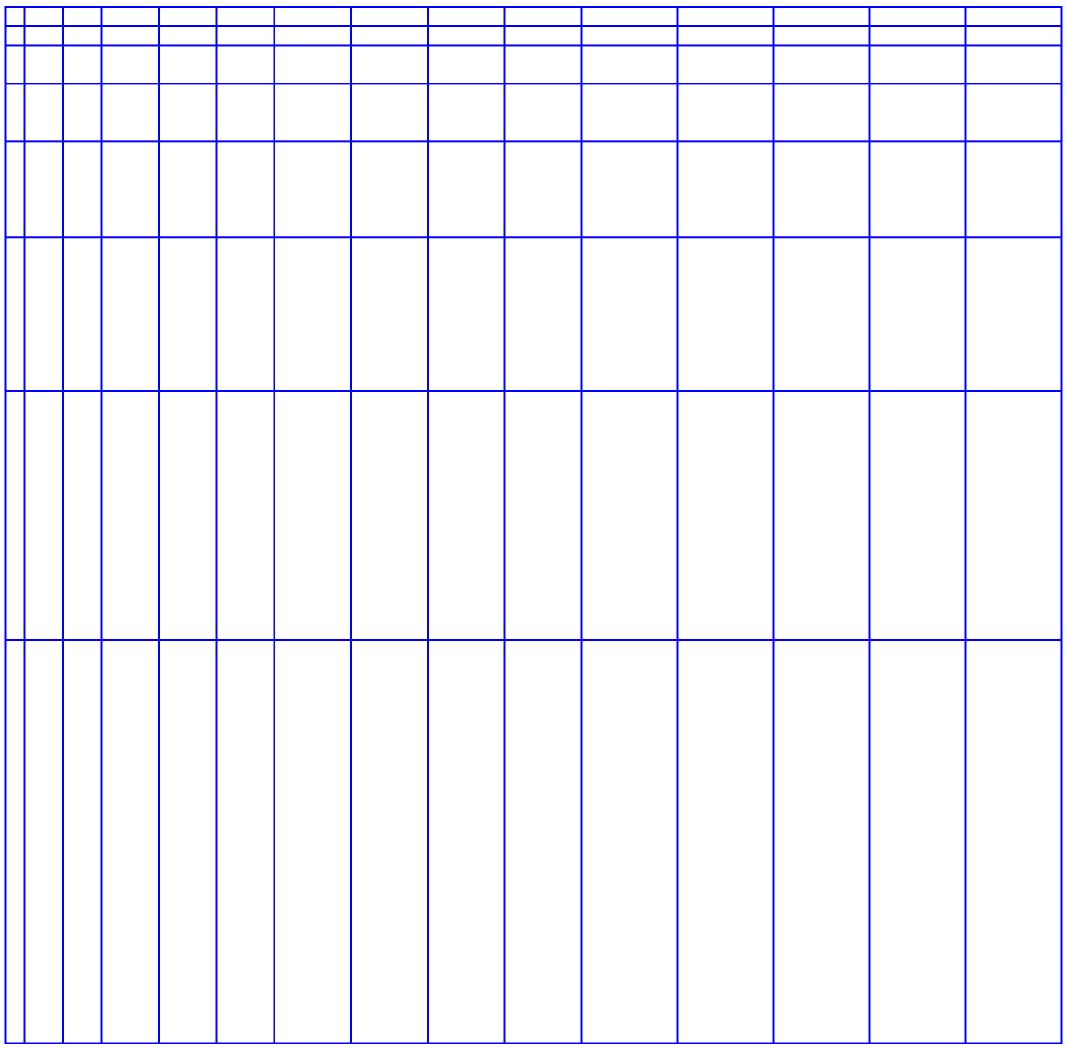
I x F



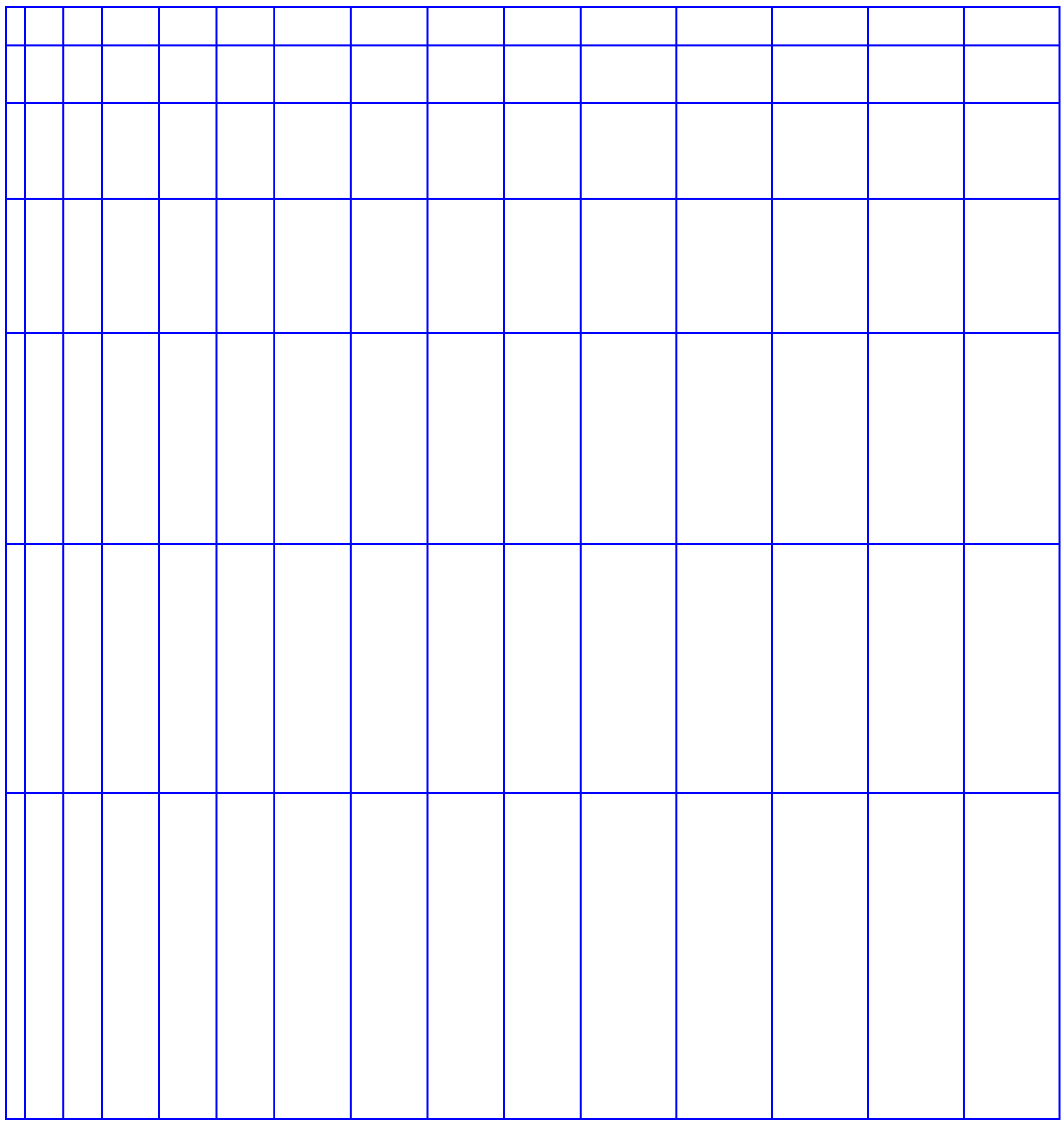
I x P



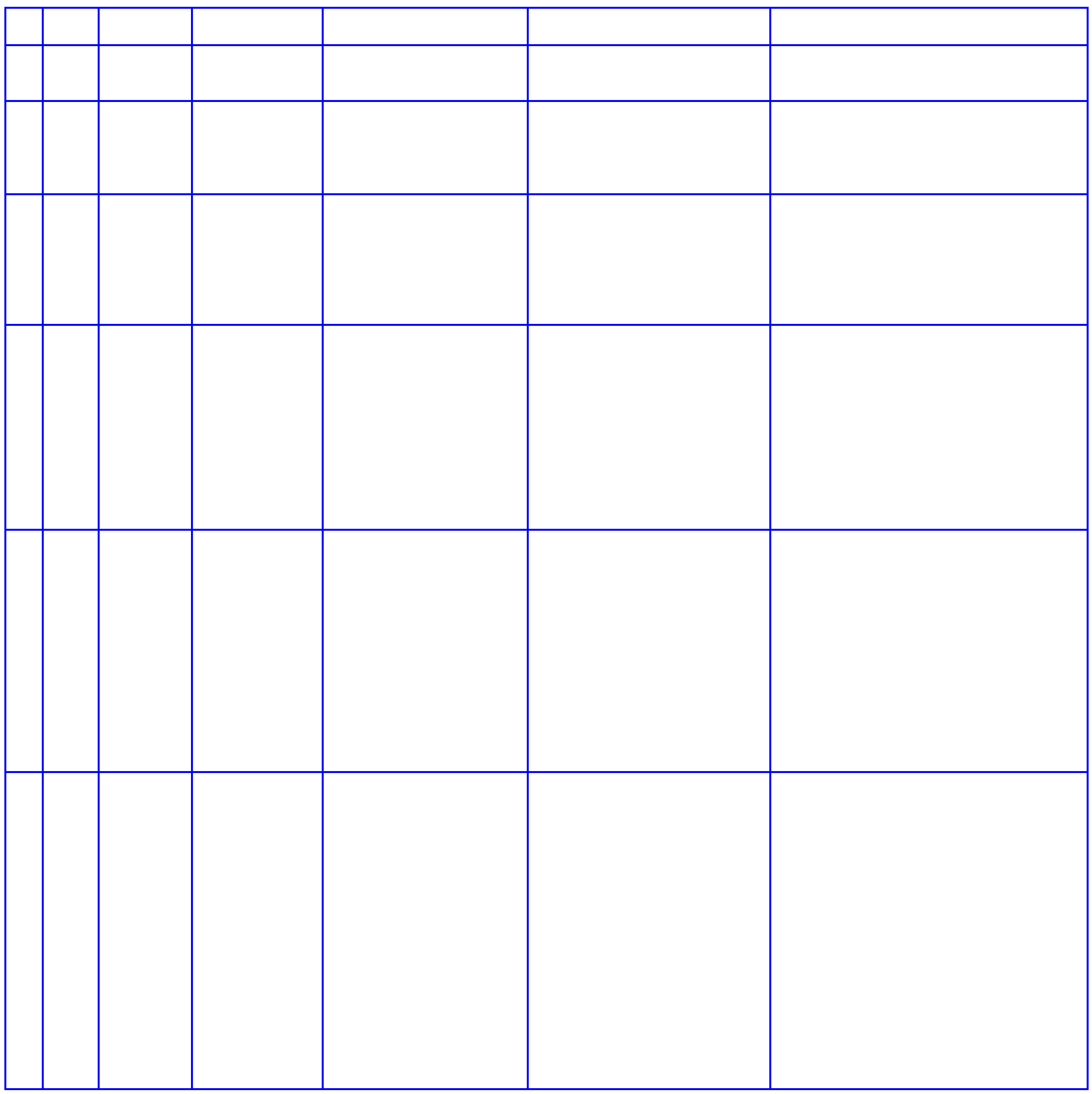
M x M



M x F



M x P



P x P