Lesson 12: Making Block Matrices in \LaTeX

Putting vertical lines all the way down the columns is as easy as pie. Just \texttt{array} to make the matrix and insert a vertical bar between the columns where you want a vertical bar. Note that this is exactly like if you were using a tabular environment. For example

\begin{verbatim}
\begin{array}{c|c|c|c}
A & Ab & \cdots & A^{n-1}b
\end{array}
\end{verbatim}

Putting in a horizontal line that spans the whole matrix is no harder. In fact it is exactly the same as it is for a tabular – just insert an \texttt{\hline} after the \texttt{double backslash}.

\begin{verbatim}
\begin{array}{cc}
A & B \\
\hline
C & D
\end{array}
\end{verbatim}

But suppose you only want to span a few columns. The you need to learn \texttt{\cline{\(n-m\)}} which puts a horizontal line from column \(n\) to \(m\) In this example I have also introduced the use of \texttt{\texttt{\multicolumn}} to just put a vertical bar between two columns in one row. This is the hardest thing.

\begin{verbatim}
\begin{array}{ccc}
\multicolumn{1}{|c|}{B} & \\
\cline{1-2}
C & D
\end{array}
\end{verbatim}

\begin{verbatim}
\renewcommand*{\temp}{\multicolumn{1}{r|}{}}
\begin{array}{cccc}
1 & 2 & 3 & \temp & 7 & 6 \\
\cline{1-6}
2 & 4 & 6 & \temp & 5 & 4
\end{array}
\end{verbatim}
\textbf{PROBLEM:}

Give \LaTeX syntax to build the matrix
\[
F = \begin{bmatrix}
A & B \\
C & D
\end{bmatrix}
\]