Lesson 26 (Sparse Matrix) For the following problems, <mark>use 1-based indexing, i.e. the index starts with 1 not 0</mark>.

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(a) Convert the sparse matrix below to a dense matrix.

$$
\begin{array}{ll}
(1,3) & 5 \\
(2,1) & 3 \\
(4,4) & 1 \\
(5,3) & 2
\end{array}
\qquad
\begin{pmatrix}
0 & 0 & 5 & 0 \\
3 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 \\
0 & 0 & 0 & 1 \\
0 & 0 & 2 & 0
\end{pmatrix}
$$

1

(b) Convert the dense matrix below to a sparse matrix.

$$
\begin{pmatrix}
6 & 0 & 0 & 0 & 0 & 1 & 0 & 0 \\
0 & 0 & 0 & 4 & 0 & 0 & 0 & 0 \\
2 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 3 & 0 & 0 & 0
\end{pmatrix}
\qquad
\begin{array}{ll}
(1,1) & 6 \\
(1,6) & 1 \\
(2,4) & 4 \\
(3,1) & 2 \\
(3,2) & 1 \\
(4,5) & 3
\end{array}
$$