10. For a string $x \in \{0,1\}^*$, let $N_1(x)$ denote the number of 1s in $x$. The majority function $\text{MAJ}_n : \{0,1\}^n \rightarrow \{0,1\}$ is defined as follows:

$$\text{MAJ}_n(x) = \begin{cases} 
1, & \text{if } N_1(x) \geq n/2, \\
0, & \text{otherwise}.
\end{cases}$$

Show that $\text{MAJ}_n$ can be computed using $O(n)$-sized circuits. [This is essentially Sipser's Problem 9.26 — if you use the approach suggested in the book, you need to first solve (in sufficient detail) any subproblems that come up, such as Sipser's Problem 9.24.]

(Just one problem this time. Maybe more after we've seen more of circuit complexity.)