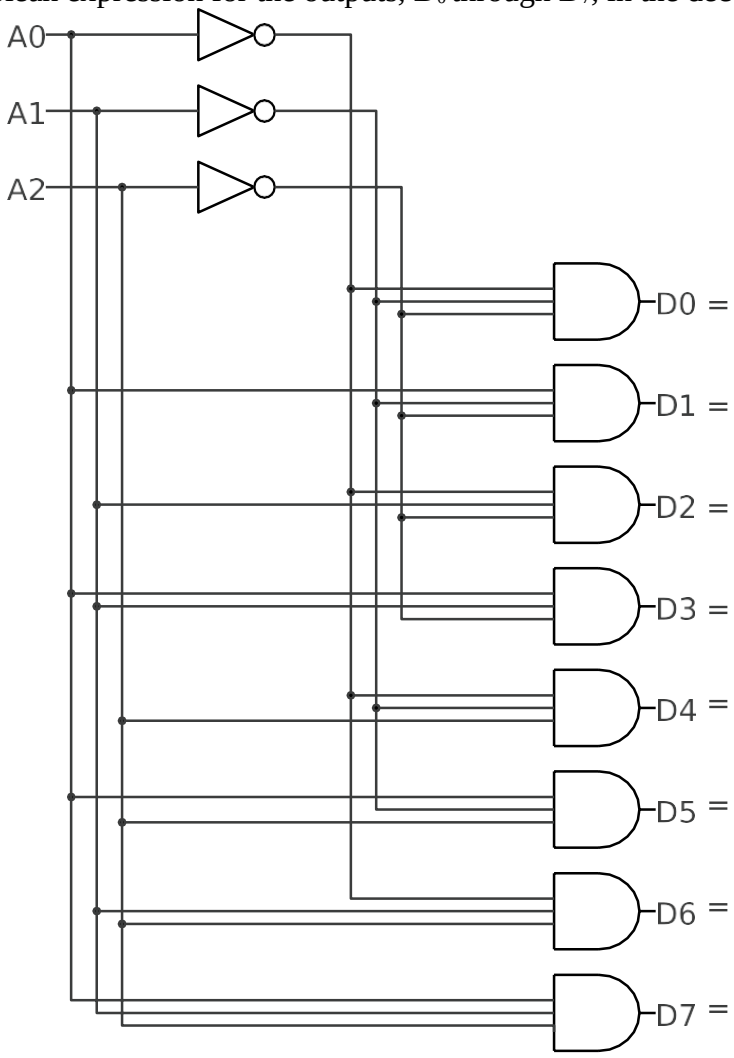
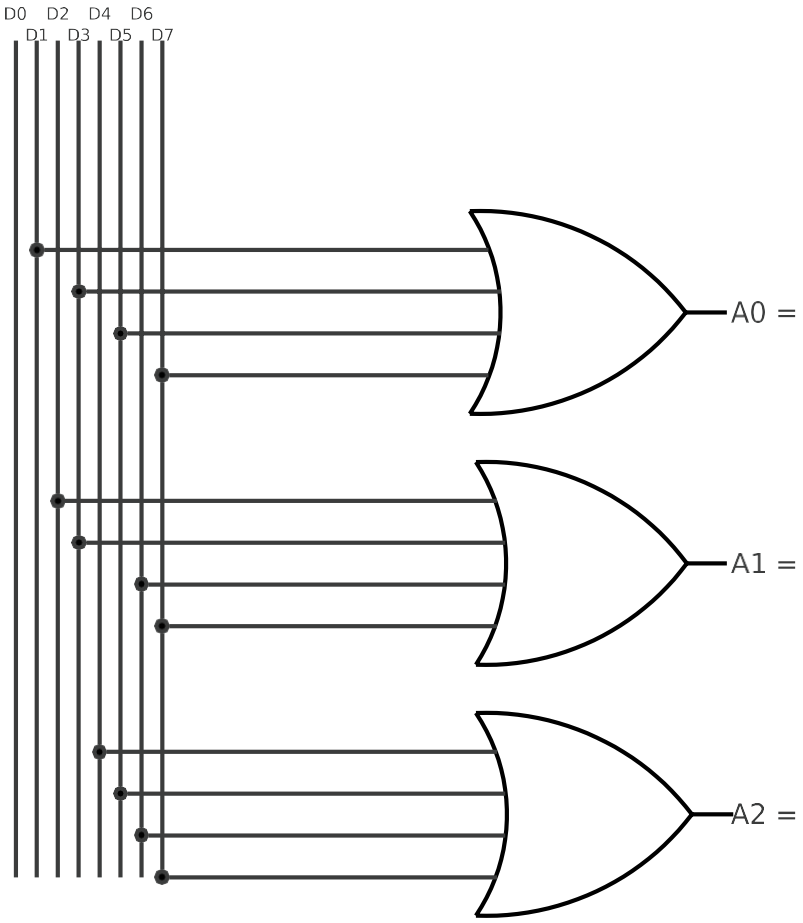
1. Provide the Boolean expression for the outputs, D_0 through D_7, in the decoder below.



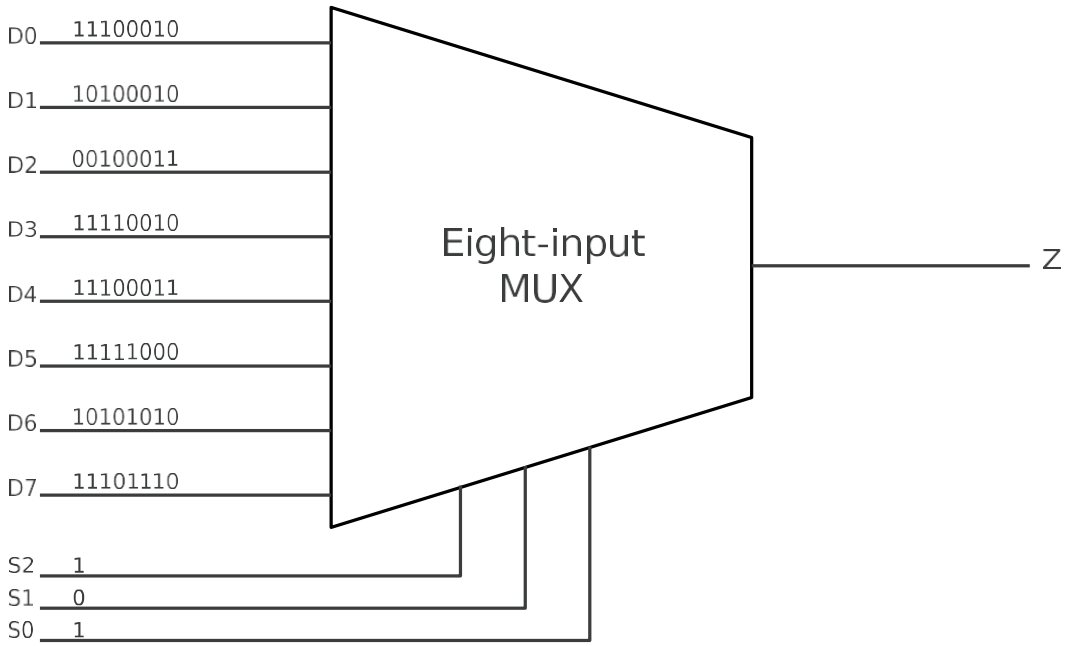
Which output would produce a HIGH for an input pattern 110 (A_2. A_1, A_0)?

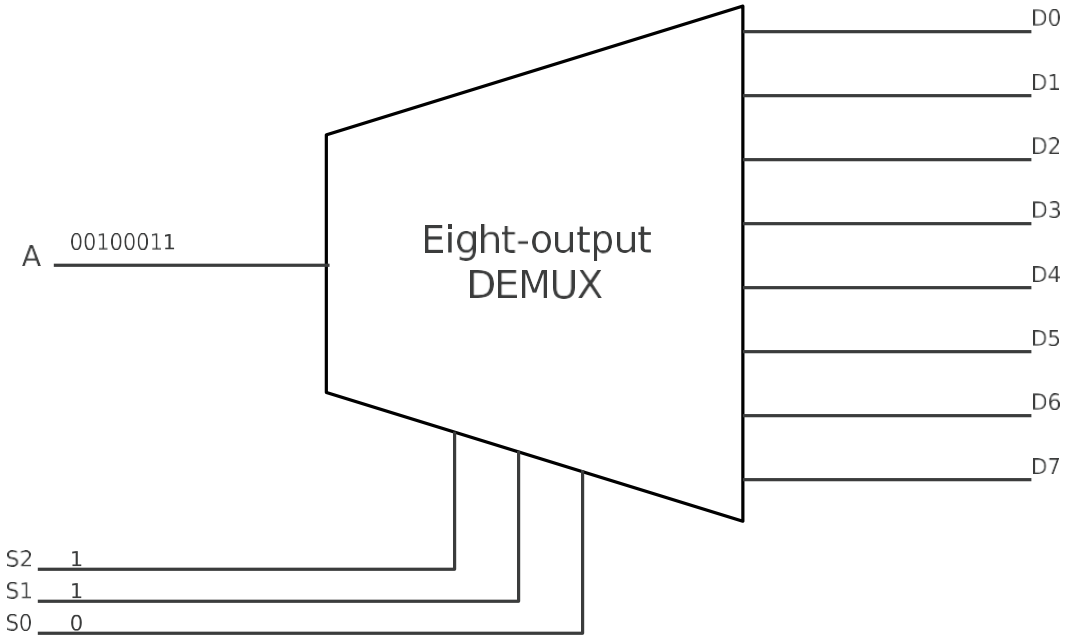
2. Provide the Boolean expression for the outputs, A_0 through A_2, in the encoder below.



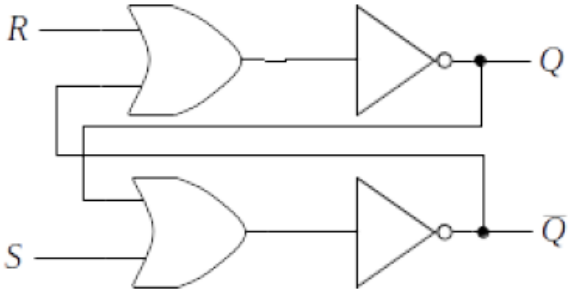
Which output would be produced if only D_6 was HIGH, and all the other inputs were LOW?

3. Show the appropriate outputs for the circuits below:



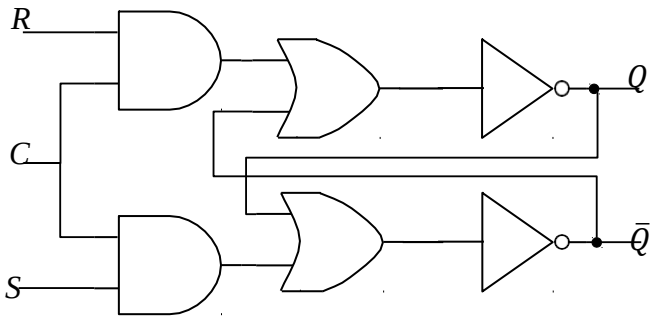


4. Fill in the truth table for R-S flip-flop.



R	***S***	***Q***	$\overline{\boldsymbol{Q}}$

5. Fill in the truth table for the clocked R-S flip-flop below. For the initial state of the circuit, assume that Q is 0 and $\overline{Q}$ is 1. Then, apply the various inputs.



C	***R***	***S***	***Q***	$\overline{\boldsymbol{Q}}$

6. List three special-purpose registers that are important to the operations of the CPU and describe their purpose.

7. A computer simply performs the instruction cycle, over and over. Succinctly describe the instruction cycle, making sure to include appropriate register names and related terms.