For each of the following languages over the alphabet $\Sigma = \{\mathtt{0}, \mathtt{1}\}$, either prove the language is regular (by giving an equivalent regular expression, DFA, or NFA) or prove that the language is not regular (using a fooling set argument). Exactly half of these languages are regular.

1. $\{\mathtt{0}^n\mathtt{1}\mathtt{0}^n \mid n \geq 0\}$

2. $\{\mathtt{0}^n\mathtt{1}\mathtt{0}^n w \mid n \geq 0 \text{ and } w \in \Sigma^*\}$

3. $\{w\mathtt{0}^n\mathtt{1}\mathtt{0}^n x \mid w \in \Sigma^* \text{ and } n \geq 0 \text{ and } x \in \Sigma^*\}$

4. Strings in which the number of 0s and the number of 1s differ by at most 2.

5. Strings such that *in every prefix*, the number of 0s and the number of 1s differ by at most 2.

6. Strings such that *in every substring*, the number of 0s and the number of 1s differ by at most 2.