Let $L_1$ and $L_2$ be the languages defined by:

\[ L_1 = \{ 10^n 10^n : n \in \mathbb{N} \} \]
\[ L_2 = \{ 10^n 10^n : m, n \in \mathbb{N} \} \]

One of these languages is regular and the other is not.

1. Which language is regular? Give a regular expression for the language.

2. Which language is not regular? Give a proof that it is not regular.