Two Coupled Oscillators
First Normal Mode Excited

System parameters
\[ k = 1 \quad k' = 1 \quad m := 1 \]

Initial conditions
\[ q_{1\text{in}} := 1 \quad q_{2\text{in}} := 1 \quad q_{\dot{1}\text{in}} := 0 \quad q_{\dot{2}\text{in}} := 0 \]
Two Coupled Oscillators
Second Normal Mode Excited

System parameters
\[ k = 1 \quad k' = 1 \quad m := 1 \]

Initial conditions
\[ q_{1\text{in}} := 1 \quad q_{2\text{in}} := -1 \quad q_{\dot{1}\text{in}} := 0 \quad q_{\dot{2}\text{in}} := 0 \]

Graphs showing the displacement and normal coordinate over time.
Two Coupled Oscillators
Strong Coupling ($k' \approx k$)

System parameters

\[
\begin{align*}
  k &= 1 \\
  k' &= 1 \\
  m &= 1 \\
\end{align*}
\]

Initial conditions

\[
\begin{align*}
  q_{1\text{in}} &= 1 \\
  q_{2\text{in}} &= 0 \\
  q_{1\text{in}} &= 0 \\
  q_{2\text{in}} &= 0 \\
\end{align*}
\]

Graphs showing the displacement and normal coordinate over time.
Two Coupled Oscillators
Weak Coupling ($k' \ll k$)

System parameters
\[ k = 1 \quad k' = 0.08 \quad m := 1 \]

Initial conditions
\[ q_{1\text{in}} := 1 \quad q_{2\text{in}} := 0 \quad q\dot{1}_{\text{in}} := 0 \quad q\dot{2}_{\text{in}} := 0 \]