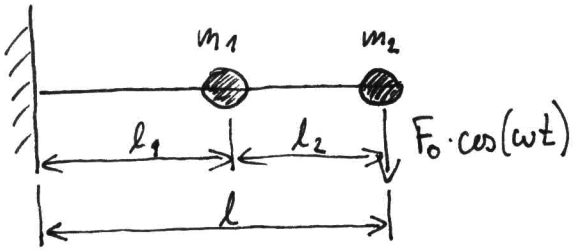
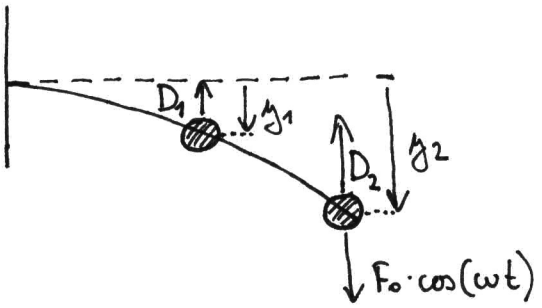


$m_1, m_2, l_1, l_2, F_0, \omega$

$P = \begin{bmatrix} \alpha_{11} & \alpha_{12} \\ \alpha_{21} & \alpha_{22} \end{bmatrix}$ ... matice příčinkových činitelů

Řešení:



$D_1 = m_1 \ddot{y}_1$

$D_2 = m_2 \ddot{y}_2$

$y_1 = \alpha_{11}(-D_1) + \alpha_{12}(F_0 \cdot \cos(\omega t) - D_2)$

$y_2 = \alpha_{21}(-D_1) + \alpha_{22}(F_0 \cdot \cos(\omega t) - D_2)$

$$\begin{bmatrix} y_1 \\ y_2 \end{bmatrix} = -\begin{bmatrix} \alpha_{11} & \alpha_{12} \\ \alpha_{21} & \alpha_{22} \end{bmatrix}\begin{bmatrix} m_1 & \emptyset \\ \emptyset & m_2 \end{bmatrix}\begin{bmatrix} \ddot{y}_1 \\ \ddot{y}_2 \end{bmatrix} + \begin{bmatrix} \alpha_{11} & \alpha_{12} \\ \alpha_{21} & \alpha_{22} \end{bmatrix}\begin{bmatrix} \emptyset \\ F_0 \end{bmatrix}\cos(\omega t)$$

$$\underline{y} = -\underline{P}\,\underline{M}\,\ddot{\underline{y}} + \underline{P}\,\underline{f_0}\cdot\cos(\omega t)$$

$\underline{P}\,\underline{M}\,\ddot{\underline{y}} + \underline{y} = \underline{P}\,\underline{f_0}\cdot\cos(\omega t)$ (nebo lze upravit na: $\underline{M}\ddot{\underline{y}} + \underline{P}^{-1}\underline{y} = \underline{F_0}\cdot\cos(\omega t)$) (**)

vlastní frekvence:

$(\underline{E} - \lambda \underline{P}\underline{M})\underline{u} = \underline{\emptyset} \rightarrow |\underline{E} - \lambda \underline{P}\underline{M}| \overset{!}{=} \emptyset \Rightarrow \lambda_{1,2} \ldots \Omega_i = \sqrt{\lambda_i}$

⋮

(další postup standardně)

(**) převod na soustavu 1. řádu (např. pro Matlab)

$\underline{P}^{-1} = \underline{K} = \begin{bmatrix} k_{11} & k_{12} \\ k_{21} & k_{22} \end{bmatrix} \rightarrow \underline{M}\,\ddot{\underline{y}} + \underline{K}\,\underline{y} = \underline{F_0}\cdot\cos(\omega t)$

$m_1 \ddot{y}_1 + k_{11} y_1 + k_{12} y_2 = \emptyset$

$m_2 \ddot{y}_2 + k_{21} y_1 + k_{22} y_2 = F_0 \cdot \cos(\omega t)$

↑ dif. rovnice 2. řádu

} zavedené $y_1 = z_1$, $y_2 = z_2$, $\dot{y}_1 = z_3$, $\dot{y}_2 = z_4$ $\Rightarrow$

$\dot{z}_1 = z_3$

$\dot{z}_2 = z_4$

$\dot{z}_3 = \frac{1}{m_1}(-k_{11}\cdot z_1 - k_{12}\cdot z_2)$

$\dot{z}_4 = \frac{1}{m_2}(-k_{21}\cdot z_1 - k_{22}\cdot z_2 + F_0 \cos\omega t)$

↑ soustava rovnic 1. řádu