Shift + F3.

Mass Normalized eigen vectors. $\varphi_1 = \begin{bmatrix} .1881 \\ .1881 \end{bmatrix}$ $\varphi_2 = \begin{bmatrix} .094 \\ -.376 \end{bmatrix}$.

$$K = \varphi^T K \varphi$$

$$\begin{bmatrix} k_{11} & k_{12} \\ k_{21} & k_{22} \end{bmatrix} = \begin{bmatrix} .1881 & .1881 \\ .094 & -.376 \end{bmatrix} \begin{bmatrix} 1.31 & -1.31 \\ -1.31 & 1.31 \end{bmatrix} (10)^6 \begin{bmatrix} .1881 & .094 \\ .1881 & -.376 \end{bmatrix}$$

$$\begin{bmatrix} k_{11} & k_{12} \\ k_{21} & k_{22} \end{bmatrix} = \begin{bmatrix} 0 & 0 \\ 0 & 289379 \end{bmatrix}$$ ← Mass Normalized Stiffness Matrix.

$$m_{ii} = \varphi^T M \varphi$$

$$\begin{bmatrix} m_{11} & m_{12} \\ m_{21} & m_{22} \end{bmatrix} = \begin{bmatrix} .1881 & .1881 \\ .094 & -.376 \end{bmatrix} \begin{bmatrix} 22.6 & 0 \\ 0 & 5.66 \end{bmatrix} \begin{bmatrix} .1881 & .094 \\ .1881 & -.376 \end{bmatrix}$$

Mass Normalized Inertia matrix. $= \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

Modal Mass Participation Factor

$$\Gamma_i = \frac{\phi_i^T M i}{m_{ii}} \quad \therefore \begin{bmatrix} \Gamma_1 \\ \Gamma_2 \end{bmatrix} = \Gamma_i$$

$$\Gamma_i = \begin{bmatrix} .1881 & .1881 \\ .094 & -.376 \end{bmatrix} \begin{bmatrix} 22.6 & 0 \\ 0 & 5.66 \end{bmatrix} \begin{bmatrix} 1 \\ 1 \end{bmatrix} = \begin{bmatrix} 5.3157 \\ -3.76 \times 10^{-3} \end{bmatrix}$$

Effective Inertia Mass:

$$(m_{ii})_j = \Gamma_i^2 m_{ii}$$

$$(m_{11})_1 = (5.3157)^2 \simeq 28.257$$

$$(m_{22})_2 = (3.76 \times 10^{-3})^2 \simeq 0$$

$$\sum (m_{ii})_j \simeq 28.257$$

Total System Inertia = 28.26