Locate center of mass

Tutorial

Name:	Locate center of mass
Description:	Procedure for locating the center of mass for a structural system.
Program:	SAP2000
Version:	12+
Model ID:	na

Center of mass, also known as center of gravity, may be located using the following process:

- Create the structural model and run analysis.
- Use "Display > Show Tables" command to export, into Excel, the following tables:
  - Model Definition > Connectivity Data > Joint Coordinates > **Table: Joint Coordinates**
  - Analysis Results > Joint Output > Joint Masses > **Table: Assembled Joint Masses**
- In Excel, calculate the location of the center of mass (com) for each coordinate direction. Use a weighted average in which assembled joint mass is the weight. For example, the x-coordinate of center of mass (x_{com}) may be calculated as follows:

$$x_{com} = \frac{\sum (x \cdot m)}{\sum m}$$

where:

- **x** = x coordinate of individual joints
- **m** = mass of individual joints

See Also

- Center-of-gravity determination tutorial