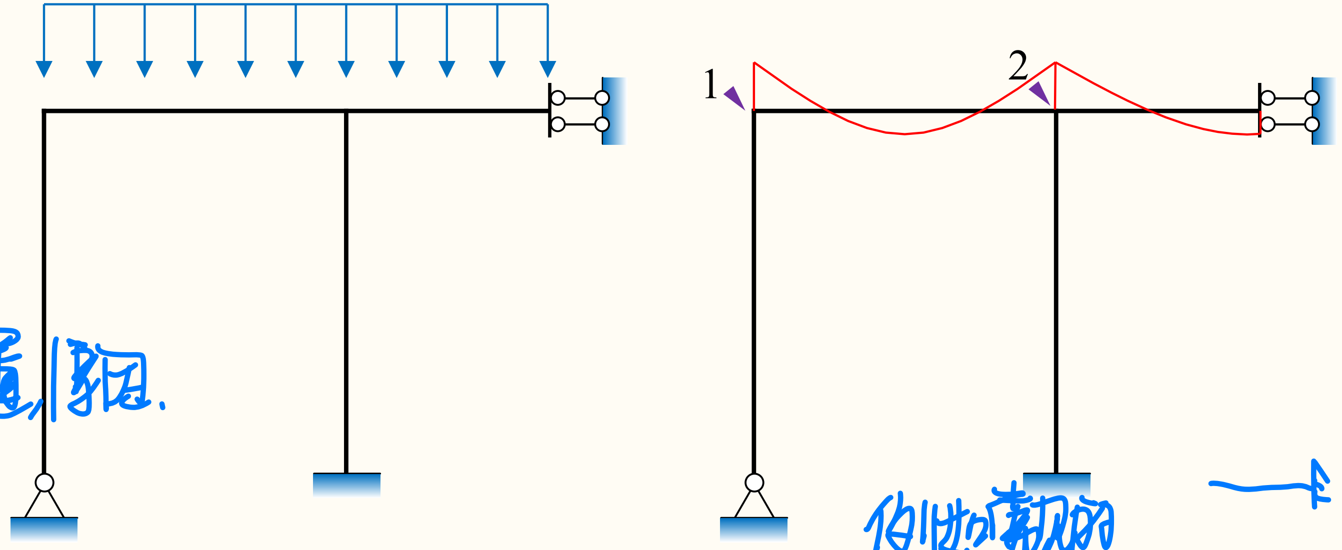
力矩分配法的迭代过程：

$$k_{11}\theta_1 + k_{12}\theta_2 = M_1 \quad \cdots \quad ①$$

$$k_{21}\theta_1 + k_{22}\theta_2 = M_2 \quad \cdots \quad ②$$

K位置，刚度.



但此方程的几种类型.

$\longrightarrow$ $\mu=\frac{1}{2}$

$\longrightarrow$ $\mu=0$

$\longrightarrow$ $\mu=-1$

令 $\theta_2 = 0$ 代入1式 $k_{11}\theta_1 = M_1 \Rightarrow \theta_{1,1}$ 释放附加刚臂1

将 $\theta_{1,1}$ 代入2式 $k_{21}\theta_{1,1} + k_{22}\theta_2 = M_2 \Rightarrow \theta_{2,1}$ 释放附加刚臂2

传递 (θ_1传递给θ_2) $\mu=\frac{K_{21}}{K_{11}}$ 即为θ_1到θ_2的传递系数.

则n为迭代次数.

将 $\theta_{2,1}$ 代入 $k_1\theta_1 + k_{12}\theta_{2,1} = 0 \Rightarrow \theta_{1,2}$ 释放附加刚臂1

传递 (θ_2传递给θ_1)

$$\theta_1 = \sum_{i=1}^{n} \theta_{1,i}$$

将 $\theta_{1,2}$ 代入 $k_{21}\theta_{1,1} + k_{22}\theta_2 = 0 \Rightarrow \theta_{2,2}$ 释放附加刚臂2

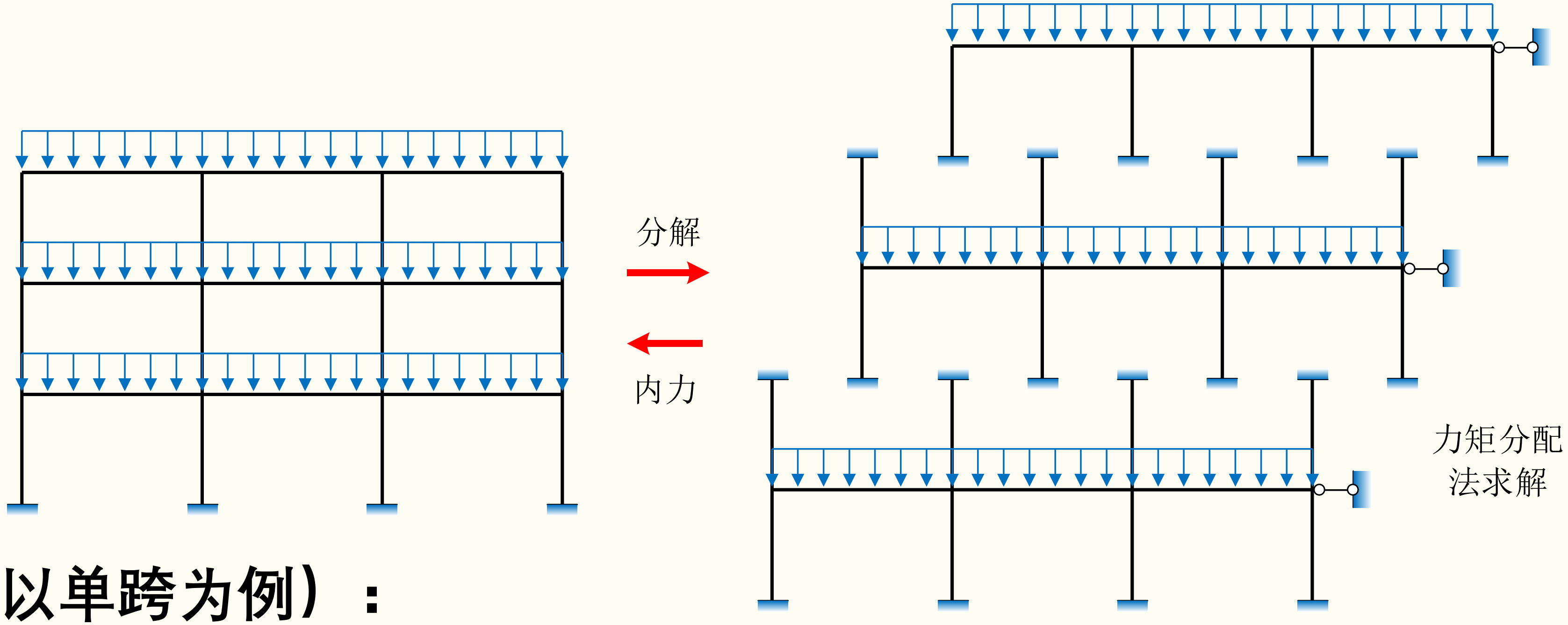
$$\theta_2 = \sum \theta_{2,i}$$

传递 ……

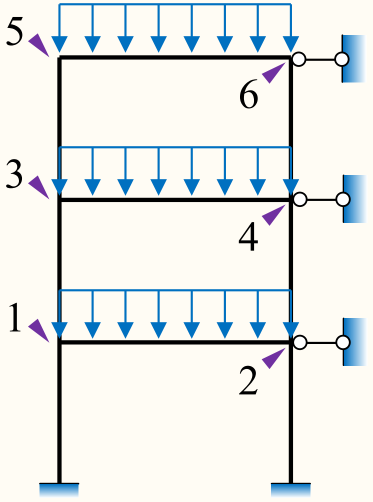
为什么是左边呢？因为没有M_1

已被BIM软件替代

分层法求解过程：



分层法迭代过程（以单跨为例）：



$$\left[\begin{array}{cc:cc:cc} k_{11} & k_{12} & k_{13} & k_{14} & k_{15} & k_{16} \\ k_{21} & k_{22} & k_{23} & k_{24} & k_{25} & k_{26} \\ \hdashline k_{31} & k_{32} & k_{33} & k_{34} & k_{35} & k_{36} \\ k_{41} & k_{42} & k_{43} & k_{44} & k_{45} & k_{46} \\ \hdashline k_{51} & k_{52} & k_{53} & k_{54} & k_{55} & k_{56} \\ k_{61} & k_{62} & k_{63} & k_{64} & k_{65} & k_{66} \end{array}\right] \left[\begin{array}{c} \theta_1 \\ \theta_2 \\ \hdashline \theta_3 \\ \theta_4 \\ \hdashline \theta_5 \\ \theta_6 \end{array}\right] = \left[\begin{array}{c} M_1 \\ M_2 \\ \hdashline M_3 \\ M_4 \\ \hdashline M_5 \\ M_6 \end{array}\right]$$

$\xrightarrow{\text{矩阵分块}}$ 乘法

→也即释放θ_1、θ_2，然后依次释放

① $$\begin{bmatrix} k_{11} & k_{12} \\ k_{21} & k_{22} \end{bmatrix}\begin{bmatrix} \theta_1 \\ \theta_2 \end{bmatrix}+\begin{bmatrix} k_{13} & k_{14} \\ k_{23} & k_{24} \end{bmatrix}\begin{bmatrix} \theta_3 \\ \theta_4 \end{bmatrix}+\begin{bmatrix} k_{15} & k_{16} \\ k_{25} & k_{26} \end{bmatrix}\begin{bmatrix} \theta_5 \\ \theta_6 \end{bmatrix}=\begin{bmatrix} M_1 \\ M_2 \end{bmatrix}$$

令θ_3、θ_4、θ_5、θ_6为零

② $$\begin{bmatrix} k_{31} & k_{32} \\ k_{41} & k_{42} \end{bmatrix}\begin{bmatrix} \theta_1 \\ \theta_2 \end{bmatrix}+\begin{bmatrix} k_{33} & k_{34} \\ k_{43} & k_{44} \end{bmatrix}\begin{bmatrix} \theta_3 \\ \theta_4 \end{bmatrix}+\begin{bmatrix} k_{35} & k_{36} \\ k_{45} & k_{46} \end{bmatrix}\begin{bmatrix} \theta_5 \\ \theta_6 \end{bmatrix}=\begin{bmatrix} M_3 \\ M_4 \end{bmatrix}$$

令θ_1、θ_2、θ_5、θ_6为零

③ $$\begin{bmatrix} k_{51} & k_{52} \\ k_{61} & k_{62} \end{bmatrix}\begin{bmatrix} \theta_1 \\ \theta_2 \end{bmatrix}+\begin{bmatrix} k_{53} & k_{54} \\ k_{63} & k_{64} \end{bmatrix}\begin{bmatrix} \theta_3 \\ \theta_4 \end{bmatrix}+\begin{bmatrix} k_{55} & k_{56} \\ k_{65} & k_{66} \end{bmatrix}\begin{bmatrix} \theta_5 \\ \theta_6 \end{bmatrix}=\begin{bmatrix} M_5 \\ M_6 \end{bmatrix}$$

令θ_1、θ_2、θ_3、θ_4为零

θ_3、θ_4

和θ_5、θ_6

且同时处理.

$$\begin{bmatrix} k_{11} & k_{12} \\ k_{21} & k_{22} \end{bmatrix}\begin{bmatrix} \theta_1 \\ \theta_2 \end{bmatrix}=\begin{bmatrix} M_1 \\ M_2 \end{bmatrix}$$

$$\begin{bmatrix} k_{33} & k_{34} \\ k_{43} & k_{44} \end{bmatrix}\begin{bmatrix} \theta_3 \\ \theta_4 \end{bmatrix}=\begin{bmatrix} M_3 \\ M_4 \end{bmatrix}$$

$$\begin{bmatrix} k_{55} & k_{56} \\ k_{65} & k_{66} \end{bmatrix}\begin{bmatrix} \theta_5 \\ \theta_6 \end{bmatrix}=\begin{bmatrix} M_5 \\ M_6 \end{bmatrix}$$

分解

($\theta_{1,1}$、$\theta_{2,1}$)、($\theta_{3,1}$、$\theta_{4,1}$)

$\theta_{1,1}$、$\theta_{2,1}$、$\theta_{3,1}$、
$\theta_{4,1}$、$\theta_{5,1}$、$\theta_{6,1}$

($\theta_{5,1}$、$\theta_{6,1}$)

$\theta_{3,1}$、$\theta_{4,1}$、$\theta_{5,1}$、$\theta_{6,1}$ 带入1式的齐式

$\theta_{1,1}$、$\theta_{2,1}$、$\theta_{5,1}$、$\theta_{6,1}$ 带入2式的齐式

$\theta_{1,1}$、$\theta_{2,1}$、$\theta_{3,1}$、$\theta_{4,1}$ 带入3式的齐式

$$\begin{bmatrix} k_{11} & k_{12} \\ k_{21} & k_{22} \end{bmatrix}\begin{bmatrix} \theta_1 \\ \theta_2 \end{bmatrix}+\begin{bmatrix} k_{13} & k_{14} \\ k_{23} & k_{24} \end{bmatrix}\begin{bmatrix} \theta_{3,1} \\ \theta_{4,1} \end{bmatrix}+\begin{bmatrix} k_{15} & k_{16} \\ k_{25} & k_{26} \end{bmatrix}\begin{bmatrix} \theta_{5,1} \\ \theta_{6,1} \end{bmatrix}=\begin{bmatrix} \cancel{M_1}\ 0 \\ \cancel{M_2}\ 0 \end{bmatrix}$$

$$\begin{bmatrix} k_{31} & k_{32} \\ k_{41} & k_{42} \end{bmatrix}\begin{bmatrix} \theta_{1,1} \\ \theta_{2,1} \end{bmatrix}+\begin{bmatrix} k_{33} & k_{34} \\ k_{43} & k_{44} \end{bmatrix}\begin{bmatrix} \theta_3 \\ \theta_4 \end{bmatrix}+\begin{bmatrix} k_{35} & k_{36} \\ k_{45} & k_{46} \end{bmatrix}\begin{bmatrix} \theta_{5,1} \\ \theta_{6,1} \end{bmatrix}=\begin{bmatrix} \cancel{M_3}\ 0 \\ \cancel{M_4}\ 0 \end{bmatrix}$$

$$\begin{bmatrix} k_{51} & k_{52} \\ k_{61} & k_{62} \end{bmatrix}\begin{bmatrix} \theta_{1,1} \\ \theta_{2,1} \end{bmatrix}+\begin{bmatrix} k_{53} & k_{54} \\ k_{63} & k_{64} \end{bmatrix}\begin{bmatrix} \theta_{3,1} \\ \theta_{4,1} \end{bmatrix}+\begin{bmatrix} k_{55} & k_{56} \\ k_{65} & k_{66} \end{bmatrix}\begin{bmatrix} \theta_5 \\ \theta_6 \end{bmatrix}=\begin{bmatrix} \cancel{M_5}\ 0 \\ \cancel{M_6}\ 0 \end{bmatrix}$$

→ 因为M1…M6已经在第一次迭代过程中被平衡掉，

第2次迭代 ➡ $\theta_{1,2}$、$\theta_{2,2}$、$\theta_{3,2}$、$\theta_{4,2}$、$\theta_{5,2}$、$\theta_{6,2}$

······ (直到满足精度即可)

$$\theta_1=\sum\theta_{1,i}\qquad \theta_2=\sum\theta_{2,i}\qquad \theta_3=\sum\theta_{3,i}$$

$$\theta_4=\sum\theta_{4,i}\qquad \theta_5=\sum\theta_{5,i}\qquad \theta_6=\sum\theta_{6,i}$$