

- Let r_k be the final rent for tenant k .
- Let i_k be the income of tenant k .
- Let R be the total rent.
- Let c be the constant residual money, each tenant has after paying rent.
- Let a_k be tenant k 's living space.

1 equal residual money among tenants. income weighted by living area quotient

$$\begin{aligned} i_1 - r_1 &= c \\ i_2 - r_2 &= c \\ i_3 - r_3 &= c \\ \dots \end{aligned}$$

$$\begin{aligned} 0 \cdot c + r_1 + r_2 + r_3 &= R \\ -c - r_1 &= -i_1 q_1 \\ -c - r_2 &= -i_2 q_2 \\ -c - r_3 &= -i_3 q_3 \\ \dots \end{aligned}$$

where

$$q_k = \frac{a_k}{a_{mean}} \quad (1)$$

solve with Gaussian Elimination...

2 rent share is proportional to income weighted by living area quotient

$$\begin{aligned} r_1 &= \frac{\zeta_1}{\beta} R \\ \zeta_1 &= i_1 q_1 \\ \beta &= \sum_{k=1}^t \zeta_k \end{aligned}$$