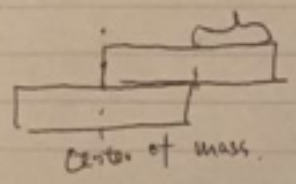
claim: by adding the nth ~~each~~ brick, the extra length that nth brick creats is $\frac{1}{2n}$

Induction: when $n=1$



$\frac{1}{2}l$

In order to prevent it from collasping, the left of brick has to be on the center of mass of the structer before.

when k th brick increase the total length by $\frac{l}{2k}$

assume the total length is now L.

first k-1 bricks

center of mass of kth brick

$$\frac{(L-l)(k)m+(l-\frac{l}{2})\cdot m}{\cancel{km}\ (k+1)m} = \frac{kL-kl+\frac{l}{2}}{k}$$

including original

$$= L-l+\frac{l}{2(k+1)}$$

by adding the k+1th brick

$$L_{k+1} = L+\frac{l}{2(k+1)}.$$

since $\sum \frac{1}{n}$ is diverging because

$$\int_1^{\infty} \frac{1}{x}dx = \ln(x)\Big|_1^{\infty} \text{ not defined.}$$

$$\frac{1}{2}\sum\frac{1}{n} = \sum\frac{1}{2n} \text{ diverges.}$$

we can go infinity.