

Balls in bins

$$\min \sim \frac{n}{R}$$

$$\max \sim \frac{n}{R} \log(\log n)$$

Polya urns

$$\min \sim \frac{n}{R^2}$$

$$\max \sim \frac{n}{R} \log n.$$

For K bins, insert $K-1$ barriers and you get how many balls are in each bin.

Preferential Attachment:

(model of web)

PA(2)



Barabasi

extended version of polya urns.

$$\begin{aligned} \text{Average in degree} &= 2 \\ \text{maximum degree} &= \sqrt{n} \\ \alpha &= 3. \end{aligned}$$

$$\begin{aligned} &= \sqrt{10 \text{ bil}} \text{ (for internet)} \\ &= 2.8 \text{ (for web)} \end{aligned}$$