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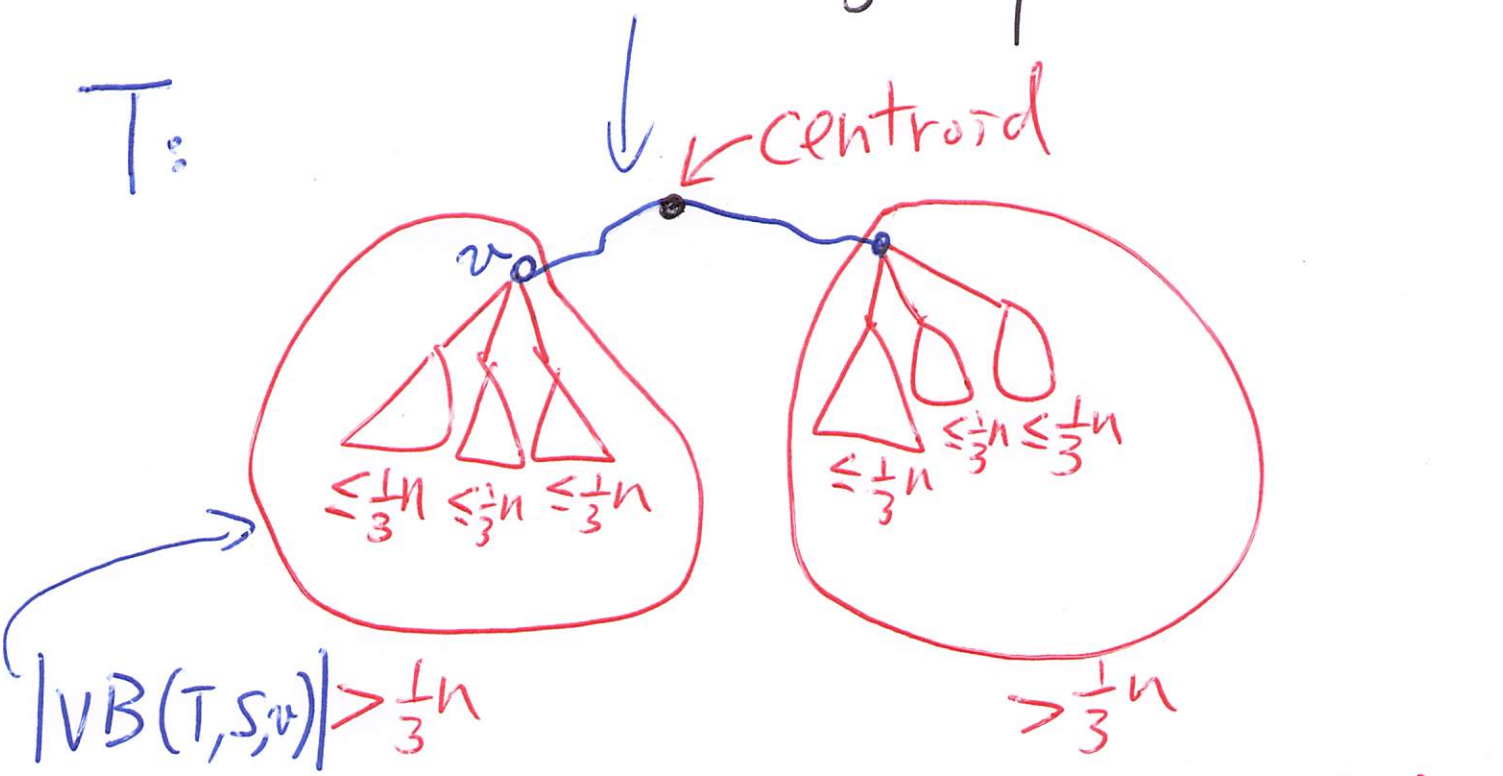
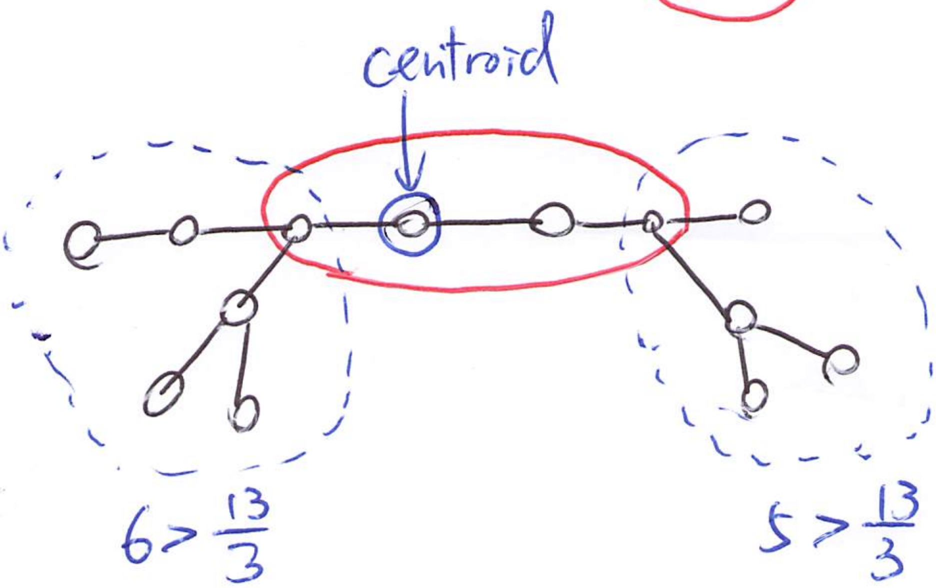
(S)

a minimal $\frac{1}{3}$-separator



(If v is a leaf of a minimal δ-separator, then $|VB(T,S,v)| > \delta n$.)



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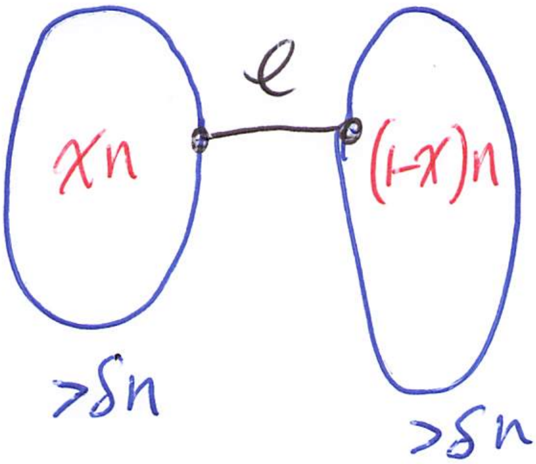
S: a minimal δ-separator $(0<\delta\le\frac{1}{2})$

e: an edge in the edge set of S

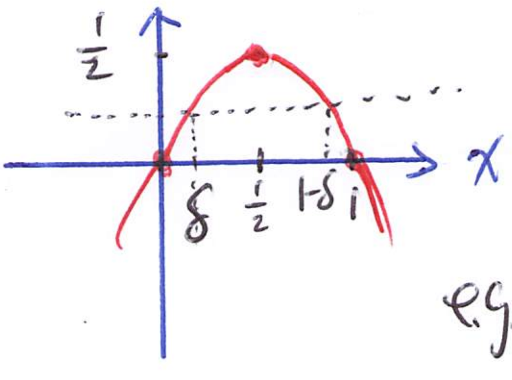


$$\left.\begin{array}{l} x>\delta \\ 1-x>\delta \end{array}\right\} \Rightarrow \underline{\delta<x<1-\delta}$$

The routing load of e is

$$2x(1-x)n^2 = 2\left(-x^2+x-\frac{1}{4}+\frac{1}{4}\right)n^2$$
$$=\left(-2\left(x-\frac{1}{2}\right)^2+\frac{1}{2}\right)n^2$$
$$\le\frac{1}{2}n^2$$

$2x(1-x)$



Furthermore, since $\delta<x<1-\delta$,

$$2x(1-x)n^2 > 2\delta(1-\delta)n^2$$

e.g. $\delta=\frac{1}{3} \Rightarrow$ the routing load $> 2\cdot\frac{1}{3}\cdot\frac{2}{3}n^2$
$= \frac{4}{9}n^2$