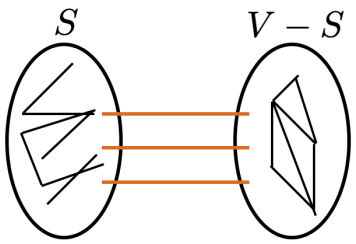
Randomized Approximation Algorithm for Max-Cut Problem

Input: Undirected graph $G = (V, E)$.
Output: Non-empty $S \subset V$ such that the number of edges between S and $V \backslash S$ is maximized.
(i.e. number of "cut edges" is maximized)



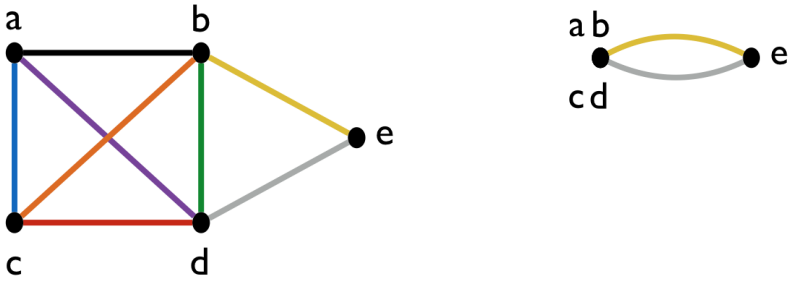
Randomized Approximation Algorithm for Max-Cut:

Analysis for the expected number of cut edges:

Monte Carlo Algorithm for Min-Cut Problem

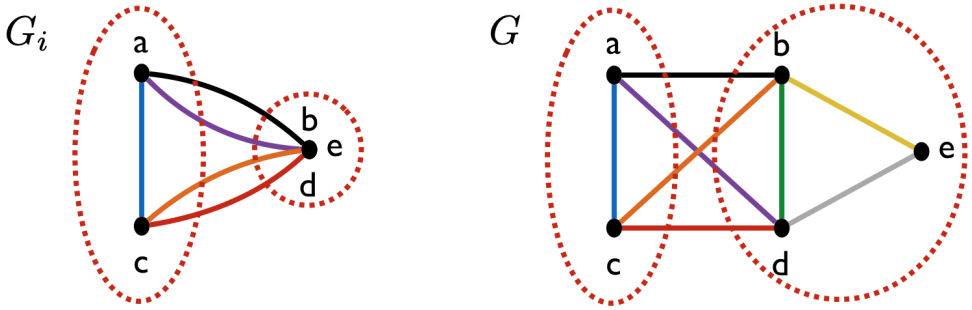
Input: Connected undirected graph $G = (V, E)$.
Output: Non-empty $S \subset V$ such that the number of edges between S and $V \backslash S$ is minimized.
(i.e. number of "cut edges" is minimized)

Algorithm:



Number of iterations:

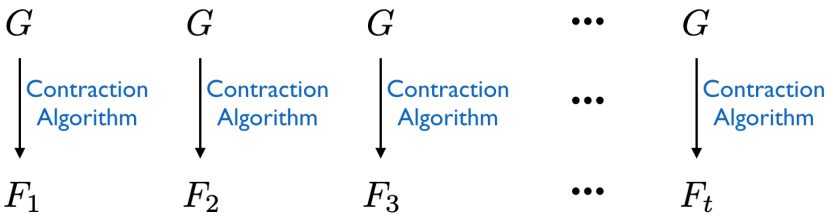
Observation:



Theorem.

Proof.
Obs 1:

Boosting Phase:



$A_i =$

Pr[error] =

World's most useful inequality: