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Approximation Algorithms

Fall 2001

Assignment 8

Problem 24 (3 points)**:**
Prove Theorem 6.9.

Problem 25 (2 points)**:**
Prove Fact 6.12(b).

Problem 26 (5 points)**:**
Show that for any undirected graph $G = (V, E)$ the following deterministic greedy algorithm for MaxCut computes a cut of size at least $\frac{1}{2}|E|$.

Algorithm GreedyMaxCut:

if $G = \emptyset$
then
  $V_\ominus = V_\oplus = \emptyset$
else
  $(V_\ominus, V_\oplus)$ =GreedyMaxCut$(G \setminus \{u\})$
  if $C((V_\ominus \cup \{u\}, V_\oplus)) > C((V_\ominus, V_\oplus \cup \{u\}))$
    then $V_\ominus = V_\ominus \cup \{u\}$
    else $V_\oplus = V_\oplus \cup \{u\}$
output $S = (V_\ominus, V_\oplus)$

Hint: use a proof by induction.