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75 \section{Problem 2: Vertex Cover}
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77
78 a) Let  $A$  be the algorithm for problem
Vertex Cover. Algorithm B:\\
79
80 def B( $G$ ):
81 \begin{itemize}
82 \item \hspace{1cm}  $n = |V|$ 
83 \item \hspace{1cm} for  $k = 1$  to  $n$ :
84 \item \hspace{2cm} run  $A$  on  $(G, k)$ 
85 \item \hspace{2cm} if yes, return  $k$ .
86 \end{itemize}
87 The number of times calling  $A$  is at most  $n$ .
88
89
90 \vspace{10pt}
91
92 b) Let  $C$  be the algorithm to find the
actual smallest Vertex Cover: \\
93
94 def C( $G$ ):
95 \begin{itemize}
96 \item \hspace{1cm}  $VC = \{\}$ 
97 \item \hspace{1cm} for  $v = 1$  to  $n$ :
98 \item \hspace{2cm} if  $B(G - v) < B(G)$ 
99 \item \hspace{3cm}  $VC = VC \cup \{v\}$ 
100 \item \hspace{3cm}  $G = G - v$ 
101 \item \hspace{1cm} return  $VC$ .
102 \end{itemize}
103 The number of times calling  $B$  is at most  $2n$ 
 $= O(n)$ .
104 \end{document}
105

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