Foundation of Computer Science (CS60001)

Tutorial-09

November 10, 2010

1. Prove that, the language BIG-CYCLE $:= \{ \langle G \rangle \mid G$ is a directed graph having a cycle of length $\geq \lfloor n(G) \rfloor \setminus 2 \}$ is NP-complete (Here $n(G)$ denotes the number of vertices in G, and $\lfloor \ \rfloor$ the floor function).

2. Let the problem, $P_{IS} = \{G = (V, E) \mid G$ has an independent set of size at least $k\}$. Prove that P_{IS} is NP-complete.

3. If NP $\neq$ Co-NP, prove that P $\neq$ NP.