Probabilistic Methods

Homework #5

Due: *Thursday, November 21st*

Problem 6

Let $G = (V, E)$ be a graph and suppose that each vertex $v \in V$ is associated with a list of colours $S(v)$ of size at least $10d$, where $d \geq 1$. Moreover, let us assume that for each $v \in V$ and $c \in S(v)$ there are at most d neighbours u of v for which $c \in S(u)$. Prove that there exists a colouring of vertices of V such that each vertex v is coloured with a colour from the list $S(v)$, and no edge of G has both ends coloured with the same colour.