Programming Languages (CS329)   **Homework 3**
Computer Science and Engineering   **Out: 2002-11-17**
Indian Institute of Technology Bombay   **Due: 2002-11-17**

1. Show the steps while finding

$$\text{infer}\Big(G = (\texttt{member(3,L)}, \texttt{member(4,L)}), \sigma = \emptyset\Big)$$

I earlier said: "More questions may be added up through 2002-11-05." I could not add more questions within that day, so here are some practice problems which you need not submit.

1. Write a Prolog program to color the nodes of a graph using a fixed number of colors such that nodes connected by an edge are assigned different colors. The rule base and goal will be derived from the input graph, and if the goal succeeds, it should be possible to figure out the the color assigned to each node.

2. Prove that
$$\frac{P \Rightarrow Q}{\text{wp}(S, P) \Rightarrow \text{wp}(S, Q)}$$

3. Will the (polymorphic) reconstruction algorithm succeed on the Y operator? Study why or why not carefully.