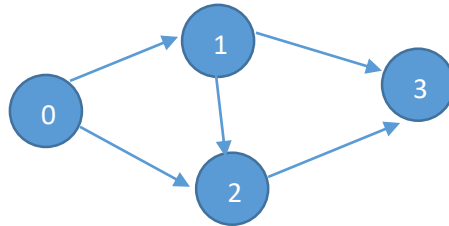


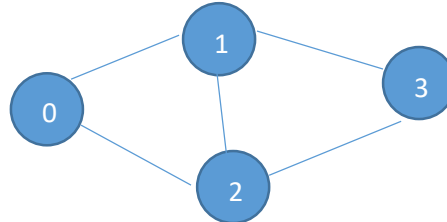
Manipal Institute of Technology, Manipal
Department of Information & Communication Technology
Subject: Natural Computing (PE-V)
VII Sem B.Tech Assignment I

Note: The data for the graphs and the problems may change

1. Apply the Adleman's approach of DNA Computation to find whether the following graph has a Hamiltonian Path. List down **all the steps** along with the **DNA operations** and the **working** for each step. Source = 0 and Destination = 3



2. Write a pseudocode to solve the SAT problem using DNA Computation and apply it to solve the following Formula $F = (x \vee y \vee z) \wedge (\bar{x} \vee \bar{y} \vee \bar{z})$. (Construct the graph for computation)
3. Write a pseudocode to solve the 3-vertex colorability problem using a filtering model in DNA computation. Apply it to solve the problem for the following graph.



4. Apply the DNA Computation operations to solve the minimal cover set problem using the sticker model. Objects = {1,2, 3,4,5} Bags = { {3,4} , {1,2,5,}, {3,5,4}, {1,3,4} }. List all the DNA Computation operations used in the Sticker Model.
5. Design a Turing Machine to accept the language of strings over $\Sigma = \{0,1\}$ of the form $a^n b^n$. Specify the transition diagram and transition table for the same.