CC484 - Constraint Satisfaction Problem

by

Edgar Galván López

Exercises

Graduate Teaching Assitant
University of Essex
egalva@essex.ac.uk

Professor Edward Tsang
University of Essex
edward@essex.ac.uk

November 1st, 2006

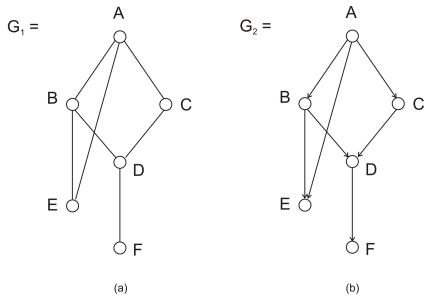

Figure 1: (a) undirected graph and (b) directed graph.

Exercises

1. Given Figure 1(a), define the following:
   (a) Write at leat one simple cycle.
   (b) Write at least one sequence which start is A and whose end vertex is F.
   (c) Write the degree of vertex D.
   (d) Write the four edges for the subgraph $\{A, B, E, D\}$.
2. Given Figure 1(b), define the following:
   (a) Write at least one cycle.
   (b) Write the outdegree of D.
   (c) Write the indegree of D.
3. Given Figure 2, compute the following constraints in relational form:
   (a) R_{13}
   (b) R_{14}.

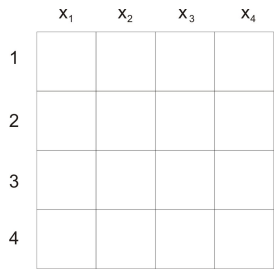

Figure 2: The 4-queens constraint network.

Answers

1. (a) (A, B, D, C, A)
   (b) (A, B, D, F)
   (c) 3
   (d) $\{(A, B), (B, E), (A, E), (B, D)\}$
2. (a) The directed graph is acyclic
   (b) 1
   (c) 2
3. (a) $R_{13} = \{(1, 2), (1, 4), (2, 1), (2, 3), (3, 2), (3, 4), (4, 1), (4, 3)\}$.
   (b) $R_{14} = \{(1, 2), (1, 3), (2, 1), (2, 3), (2, 4), (3, 1), (3, 2), (3, 4), (4, 2), (4, 3)\}$.