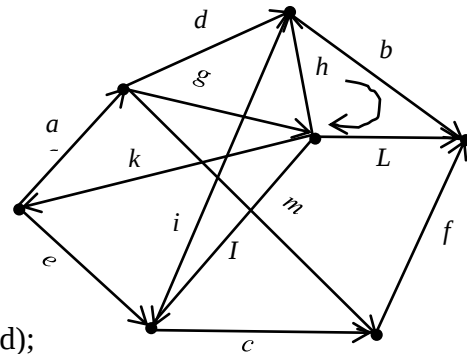


TUTORIALS - SERIES NO. 04

Exercise 01

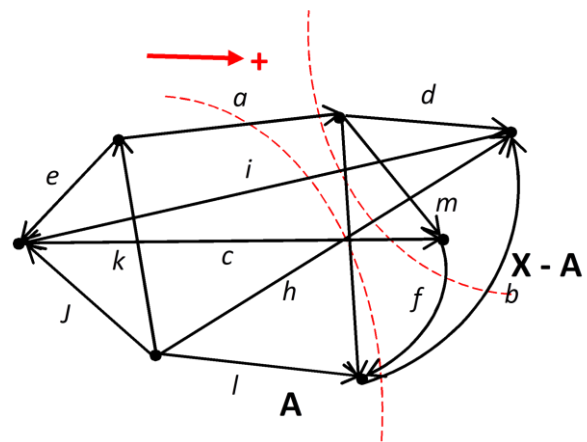
Let the following graph $G(X, U)$:



1. Give the maximal tree T of G .
2. Give the cotree T' associated with T .
3. Give the vectors associated with the cycles: $C_b = (b, l, j, e, a, d)$;
 $C_h = (h, d, a, e, j)$; $C_i = (i, e, a, d)$; $C_f = (f, l, j, e, a, m)$; $C_c = (c, m, a, e)$;
 $C_k = (k, e, j)$; $C_g = (g, j, e, a)$
4. Calculate the cyclomatic number $V(G)$
5. Give a cycle base for the graph G .

Exercise 02

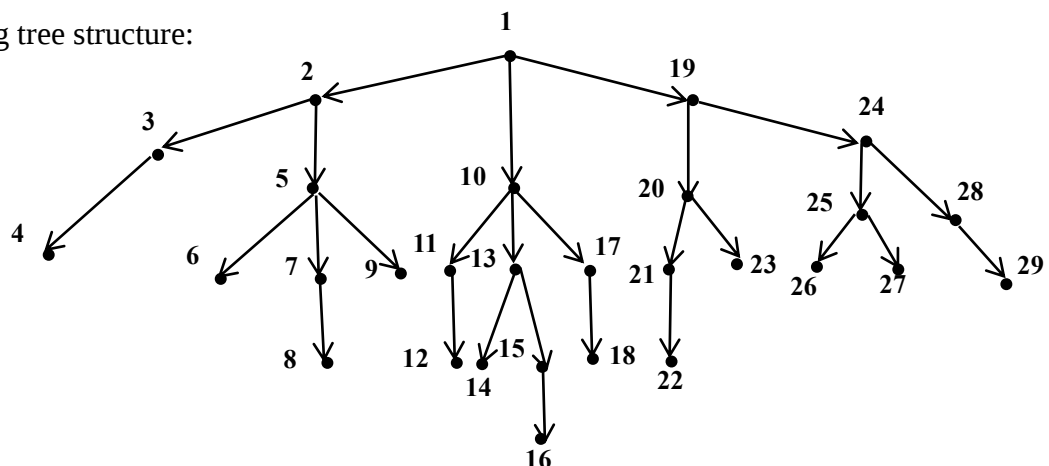
Let the following graph $G(X, U)$:



1. Give the vectors associated with the cocycles:
 $\theta_a = (a, b, c, f, g, h, i)$; $\theta_d = (d, b, h, i)$; $\theta_e = (e, b, c, f, g, h, i, k)$;
 $\theta_j = (j, b, f, g, h, k)$; $\theta_l = (l, b, f)$; $\theta_m = (m, c, f)$.
2. Calculate the cocyclomatic number $\lambda(G)$.
3. Give a cocycle base for the graph G
4. Verify that: $\vec{V}_{ci} \cdot \vec{V}_{\theta l} = 0$

Exercise 03

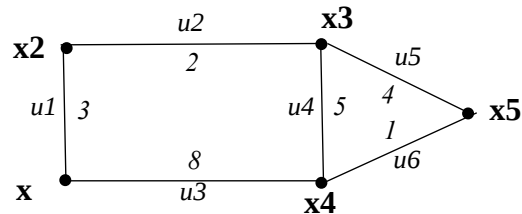
Consider the following tree structure:



1. Give a representation for this tree.
2. Perform a width browsing of the tree.
3. Perform a depth browsing of the tree.

Exercise 04

Let $G(X, U, W)$ be a connected valued graph



Give the maximum tree of minimum weight using:

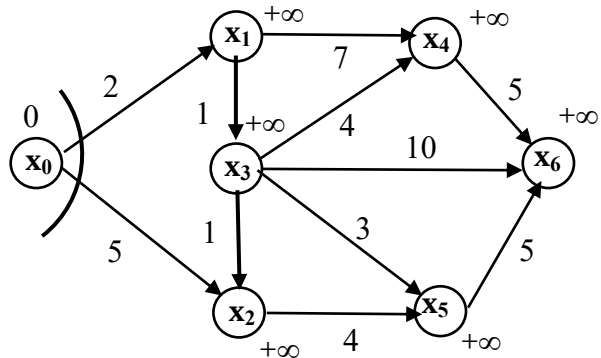
- a) – KRUSKAL algorithm 1
- b) – KRUSKAL 2 algorithm

Exercise 05

1. Represent the arithmetic expression $(ax + y)(cd - z) / (be^x)$ as a tree structure in respecting the priority rules of the operators.
2. Write the expression in Polish notation.

Exercise 06

Consider the graph below:



1. Find a shortest path SP Between x_0 and x_4
2. Find all SPs between x_0 and the other vertices of the graph by applying the Moore-Dijkstra algorithm
3. The same question (2) applying Bellman's algorithm
4. Give the SPs between x_0 and the vertices: x_4, x_5, x_6

Good luck

Subject Manager

Said KADRI