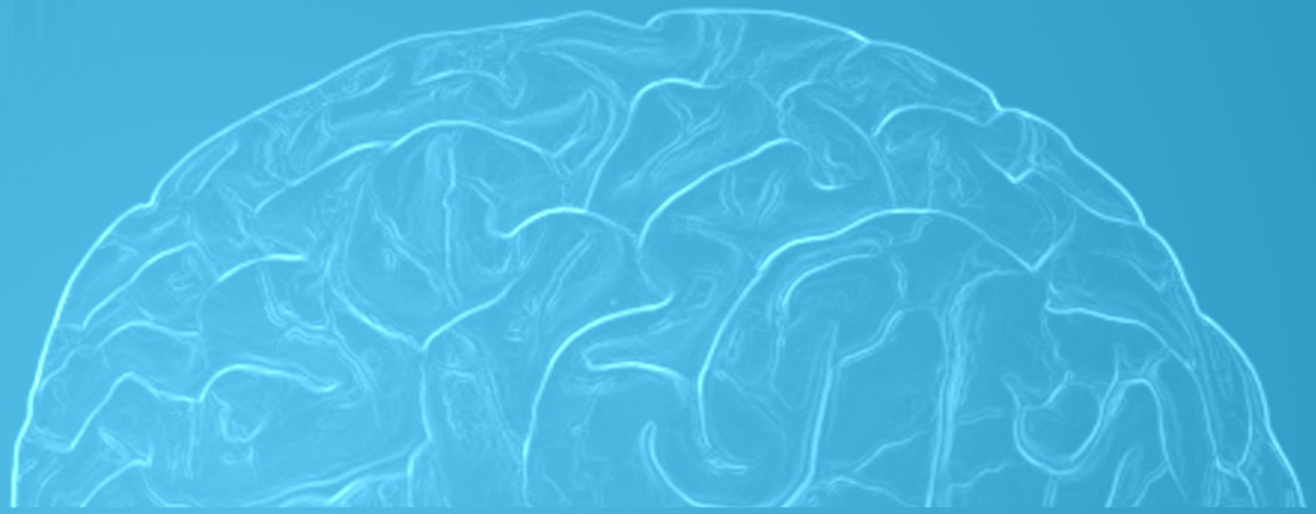
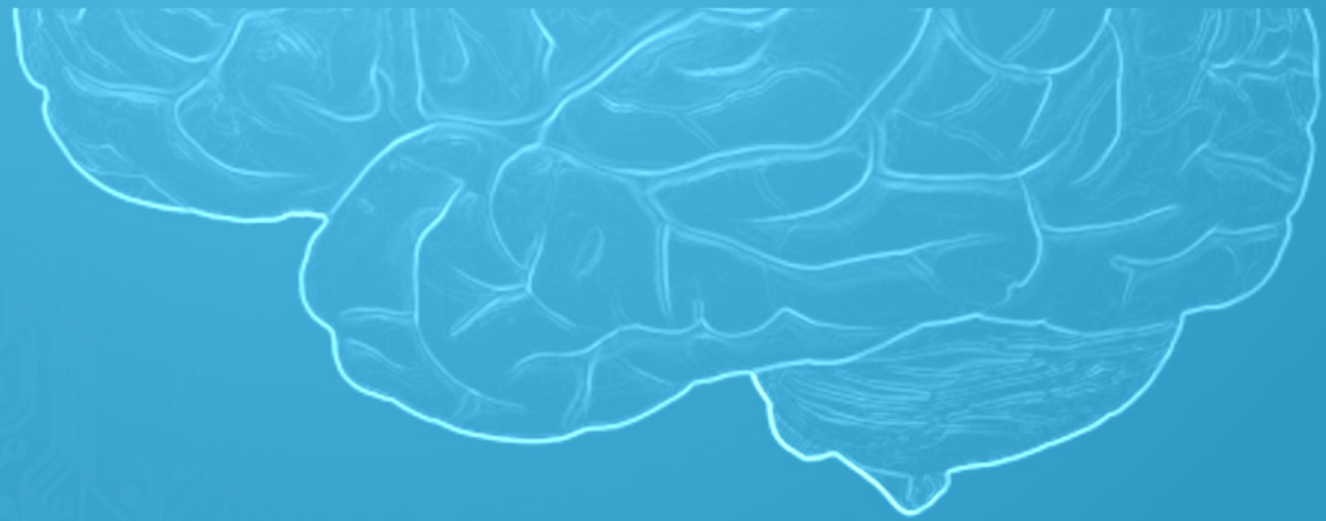
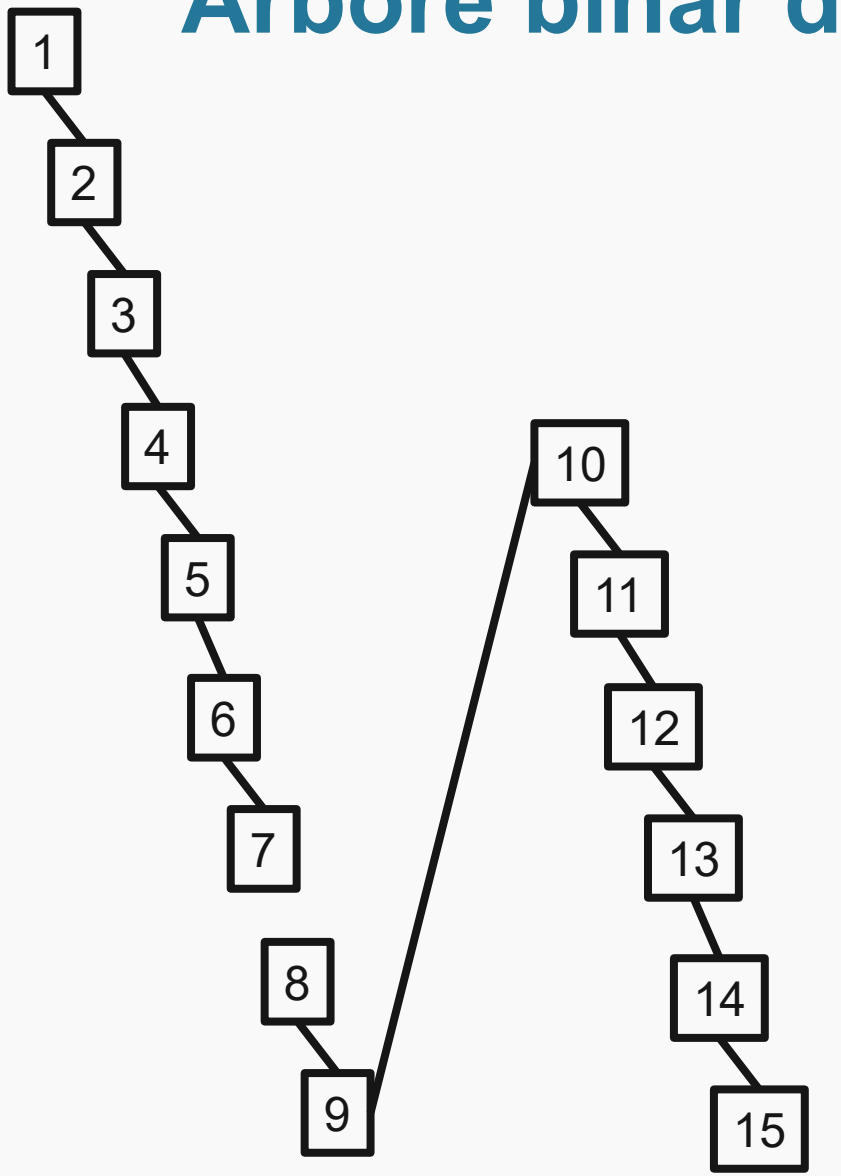


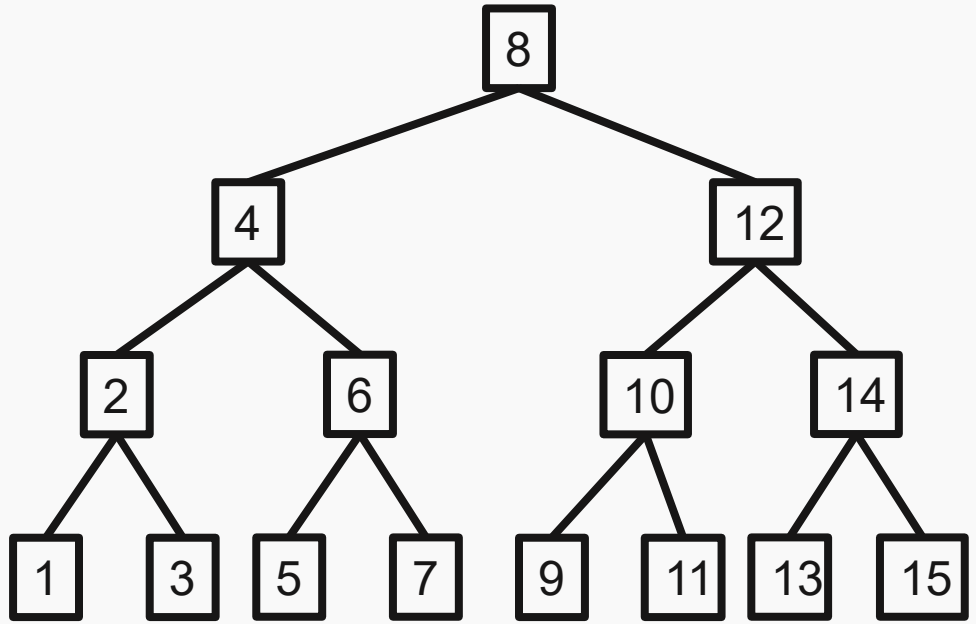
Structuri de date și algoritmi
Arbori - 2

Lect. Dr. Ing. Cristian Chilipirea – cristian.chilipirea@mta.ro



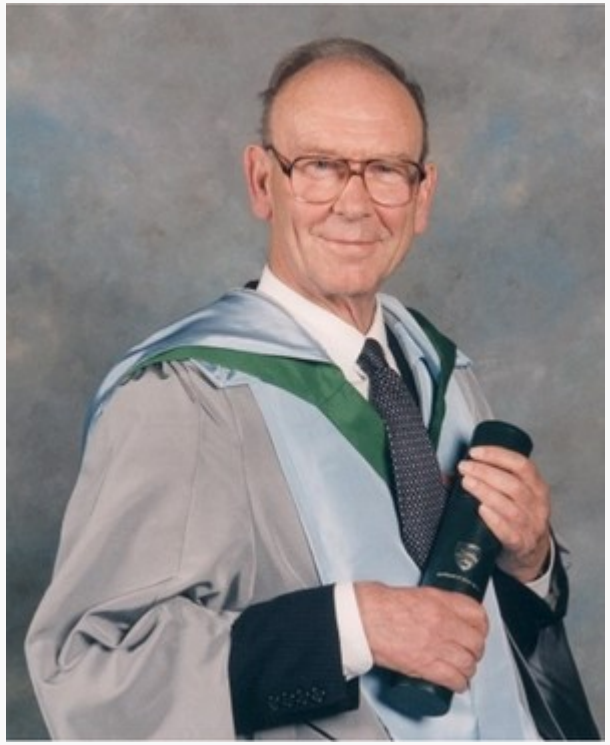
Arbore binar de căutare – înălțime





Dorim ca arborii să fie echilibrați.

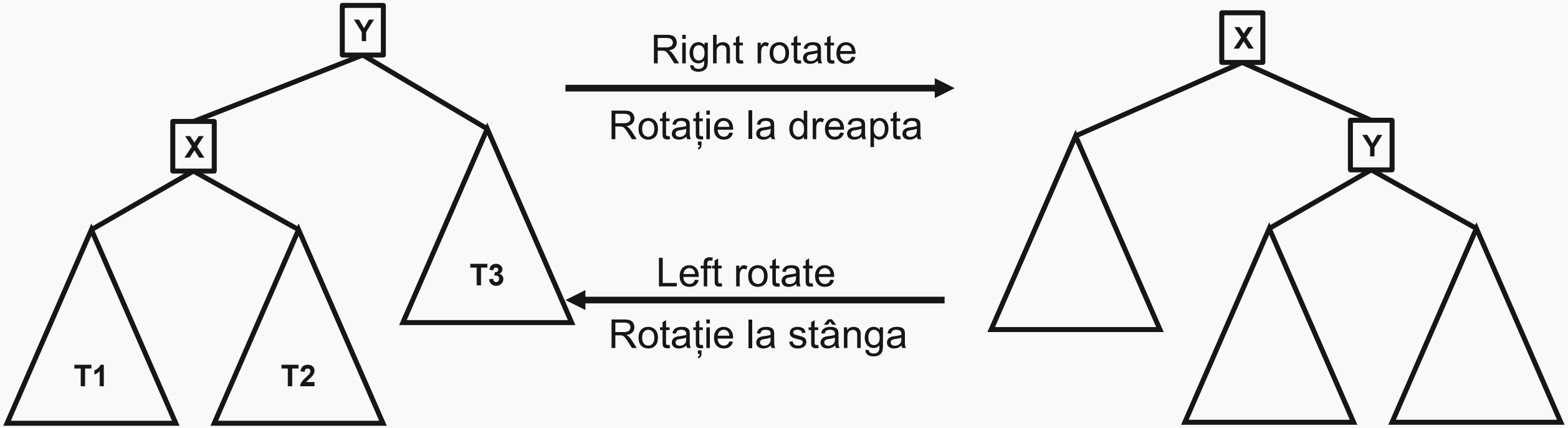
Arborii AVL (Adelson-Velsky și Landis)



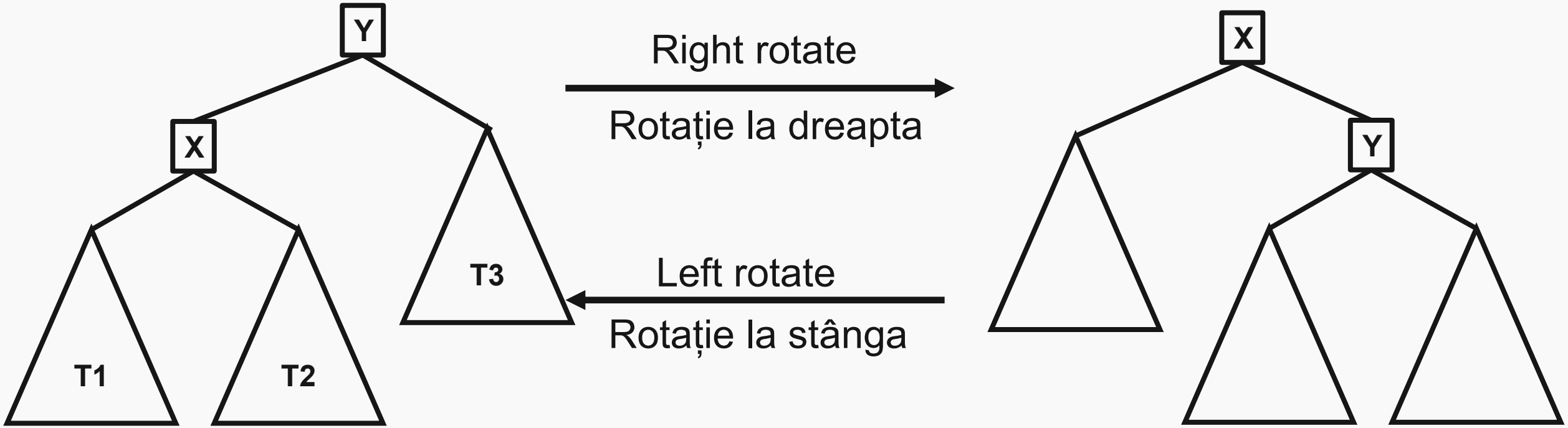
Arborii AVL (Adelson-Velsky și Landis)

Un arbore binar de căutare este echilibrat dacă și numai dacă: Înălțimea a celor 2 subarbori ai oricărui nod diferă cu cel mult 1.

Rotații în arbore binar căutare

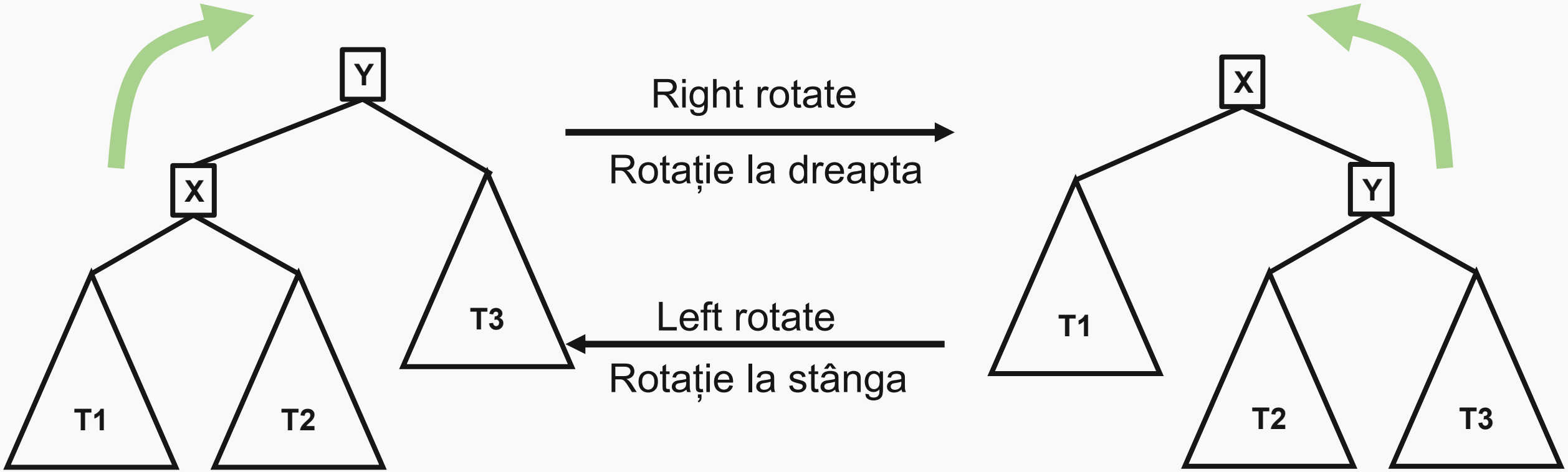


Rotații în arbore binar căutare



Proprietate Arbore Binar Căutare: $T1 < X < T2 < Y < T3$

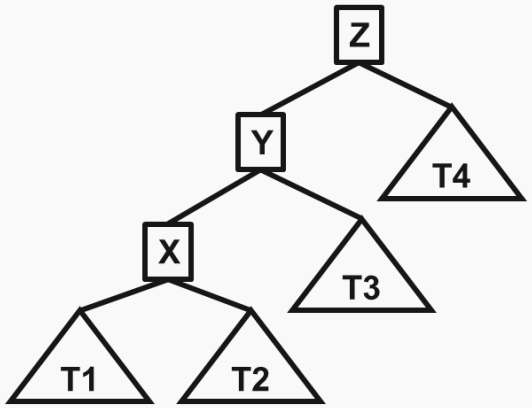
Rotații în arbore binar căutare



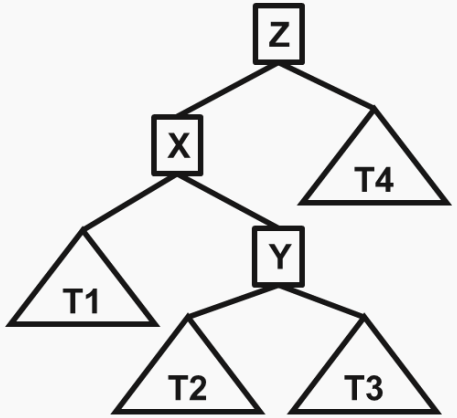
Proprietate Arbore Binar Căutare: $T1 < X < T2 < Y < T3$

Cazuri dezechilibrare cu 2

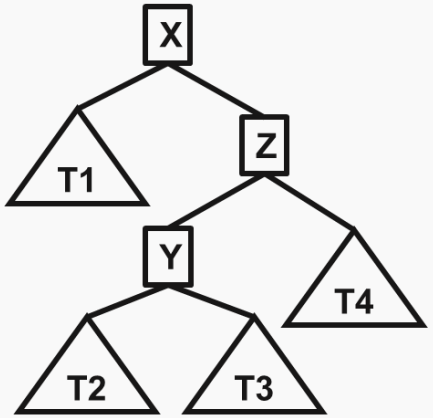
Left Left



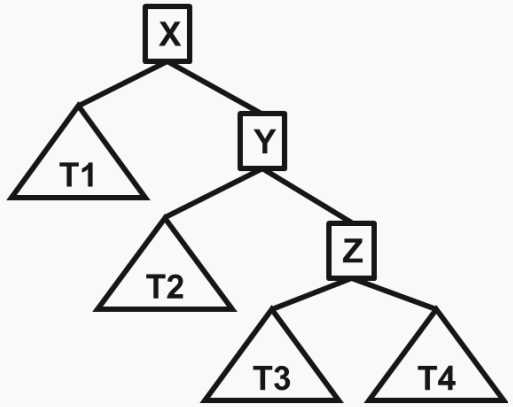
Left Right



Right Left



Right Right

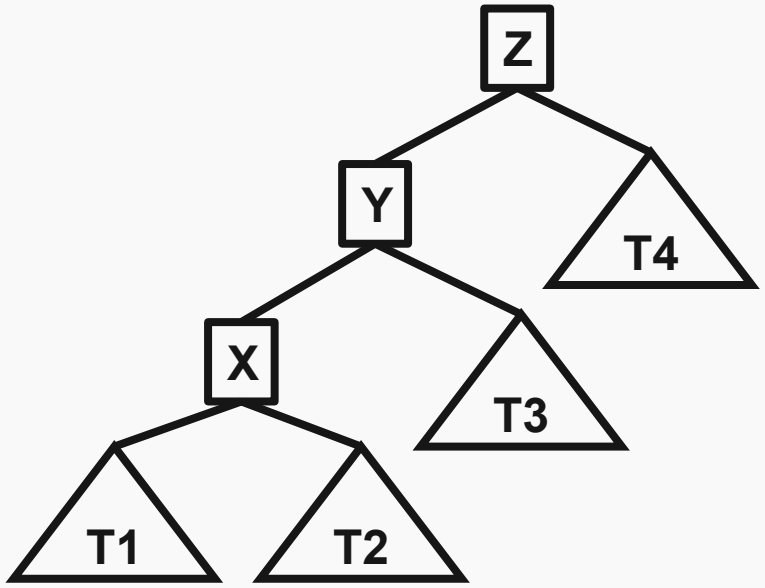


$$h(T1) \approx h(T2) \approx h(T3) \approx h(T4)$$

$$T1 < X < T2 < Y < T3 < Z < T4$$

Cazuri dezechilibrare cu 2

Left Left



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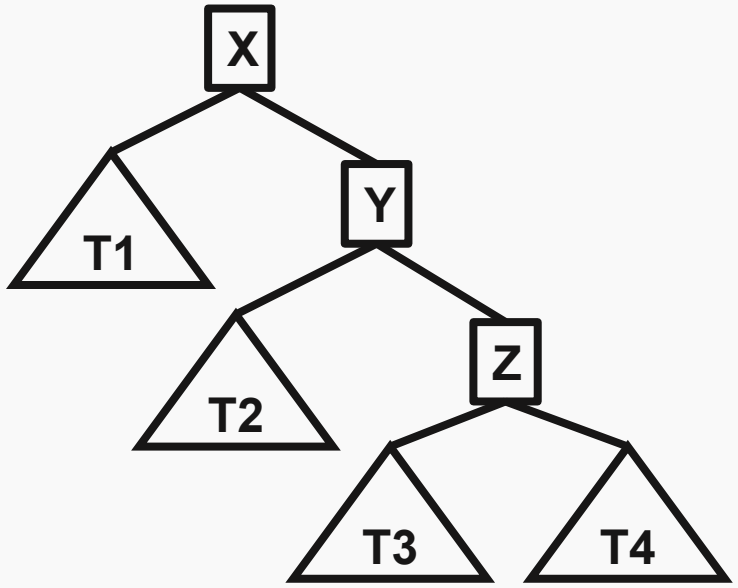

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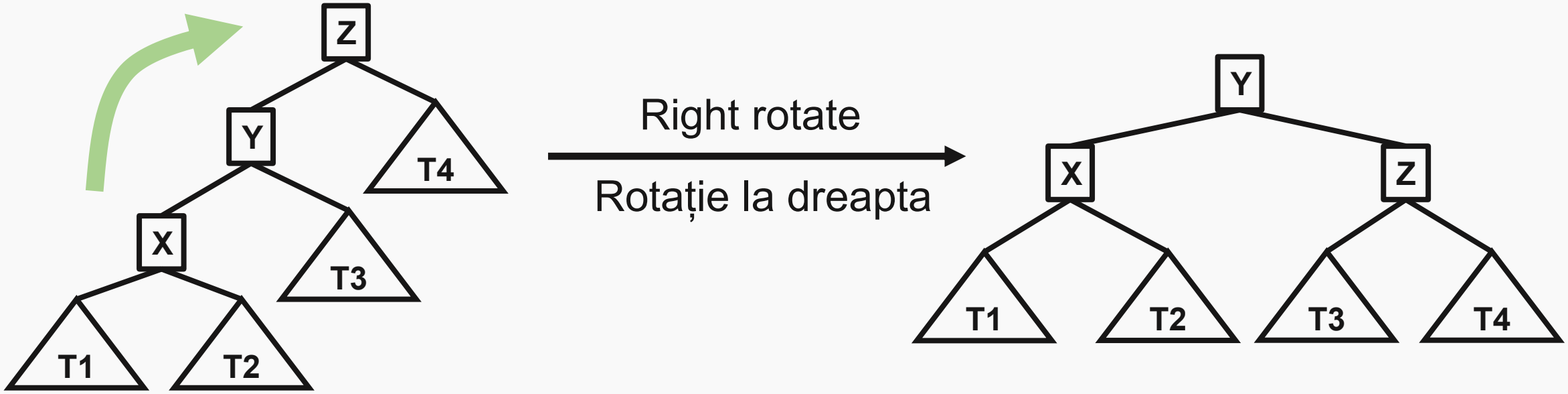

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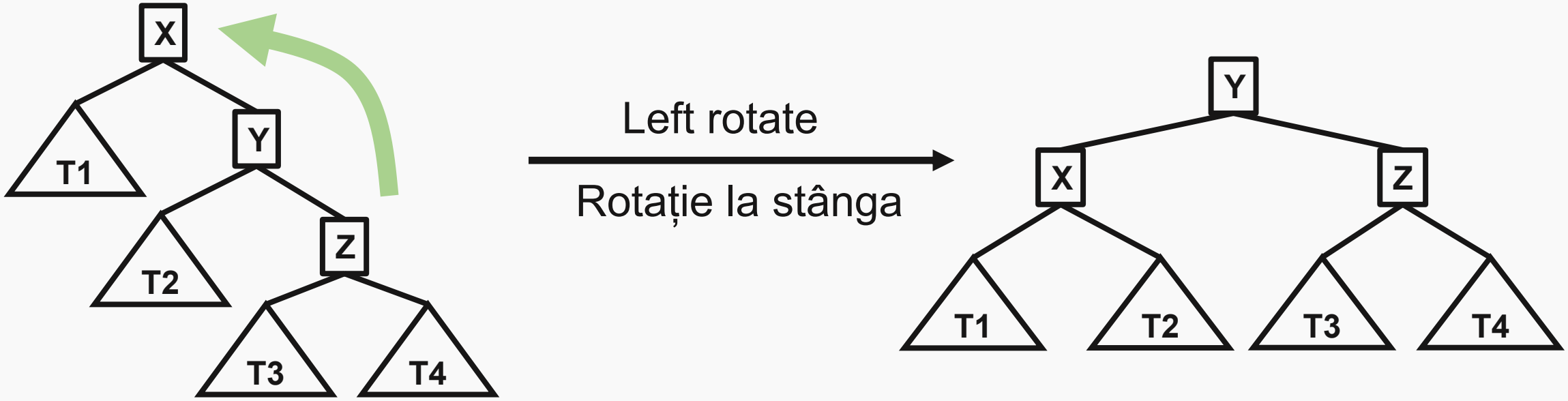
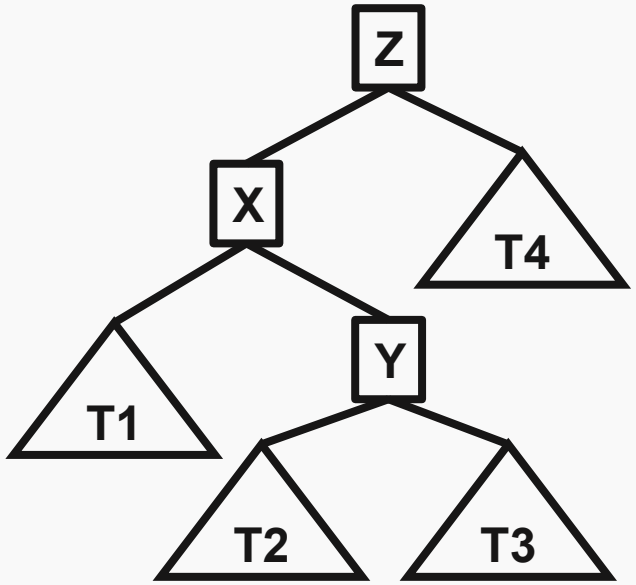
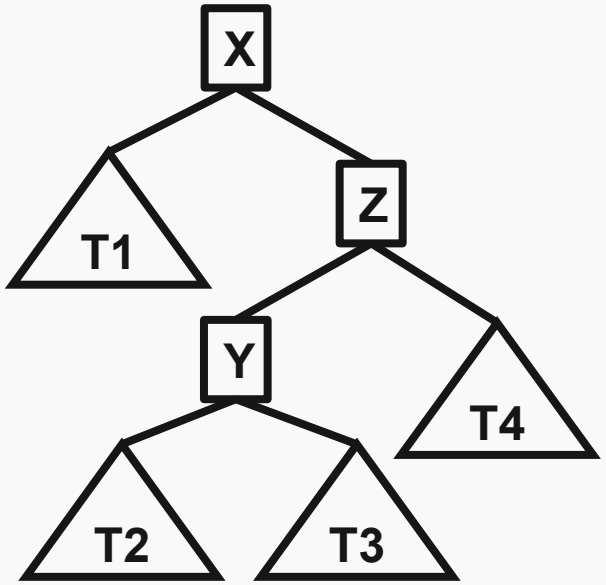


Cazuri dezechilibrare cu 2

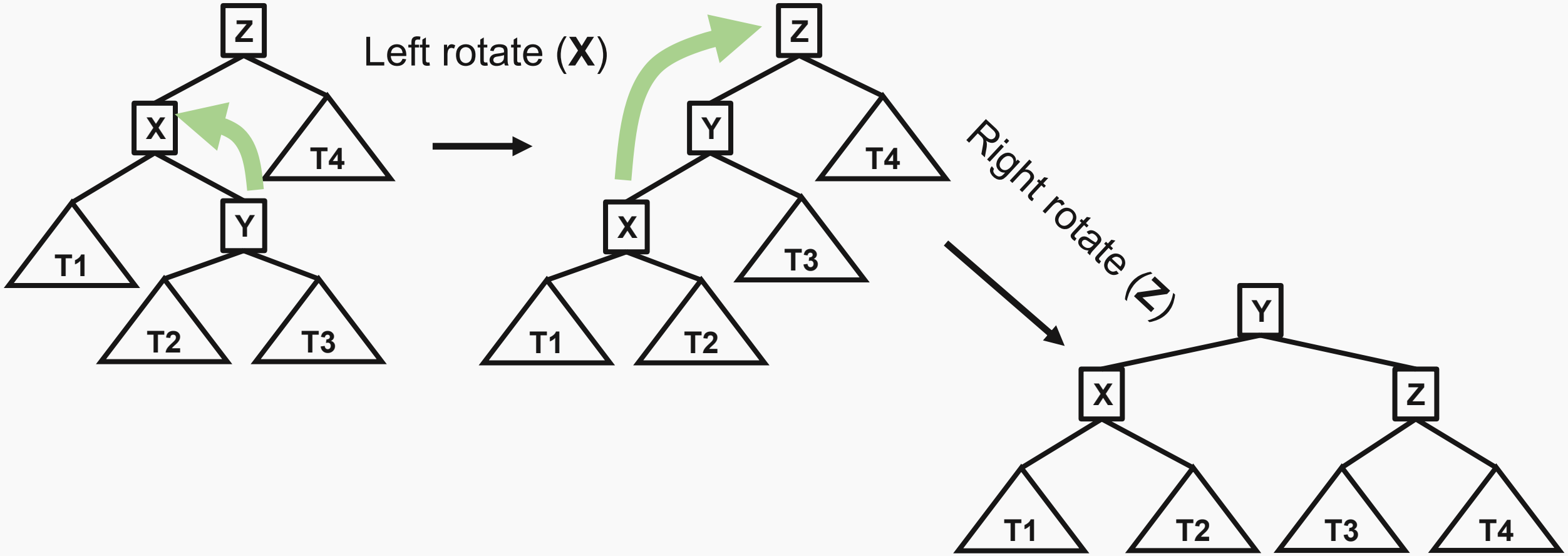
Left Right



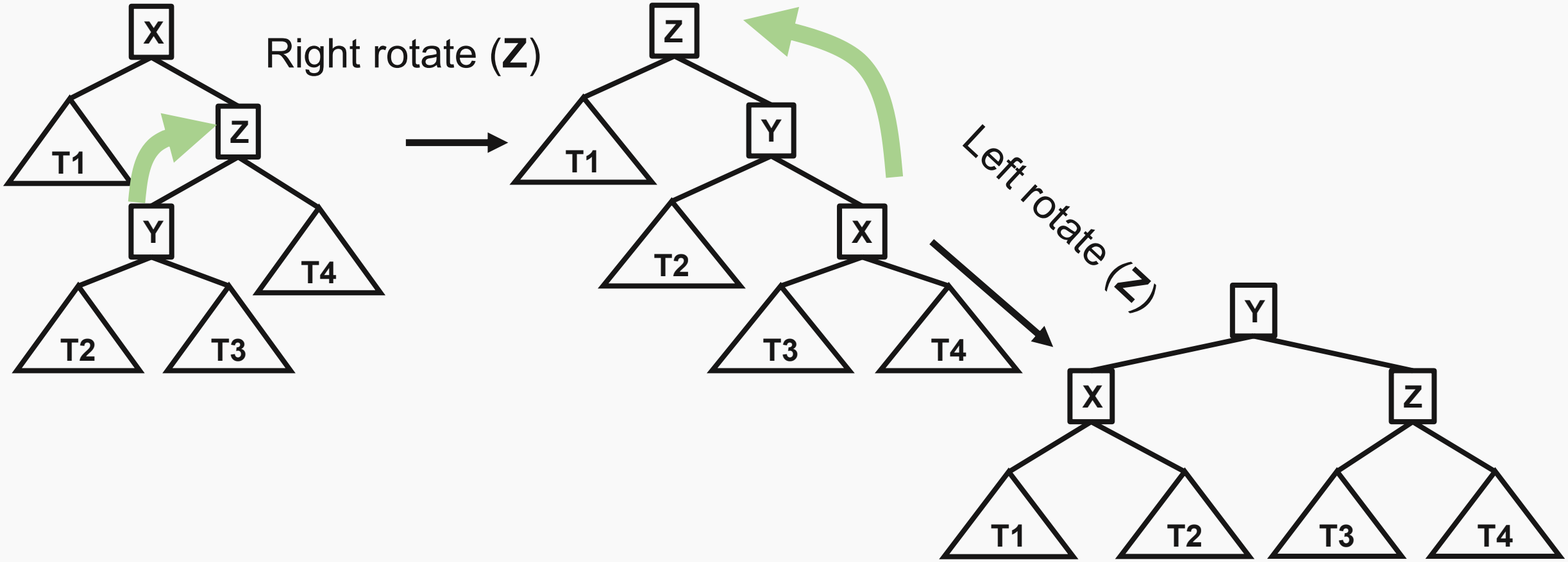
Right Left



Left Right


Z
X
T4
Y
T1
T2
T3
Left rotate (X)
Z
Y
T4
X
T3
T1
T2
Right rotate (Z)
Y
X
Z
T1
T2
T3
T4

Right Left


X
Z
T1
Y
T4
T2
T3
Right rotate (Z)
Z
Y
T1
X
T2
T3
T4
Left rotate (Z)
Y
X
Z
T1
T2
T3
T4

De ce nu aplicăm prima oară Right?