

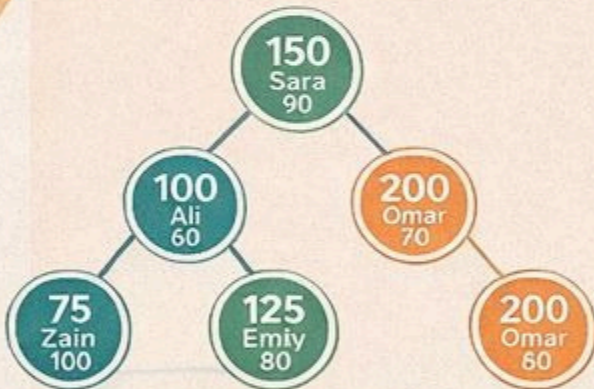
ARENA OF RATINGS – BST MATCHMAKING ENGINE



PROBLEM STATEMENT

Challenges: You must manage an arena where players have unique ratings. Some players are normal. Others are the best and need immediate matchmaking.

Ideal Solution: Use a Binary Search Tree that supports operations like insertion, search, deletion, and rank queries for efficient player matchmaking.



- rating: integer key
- name: player's name
- hp: health points

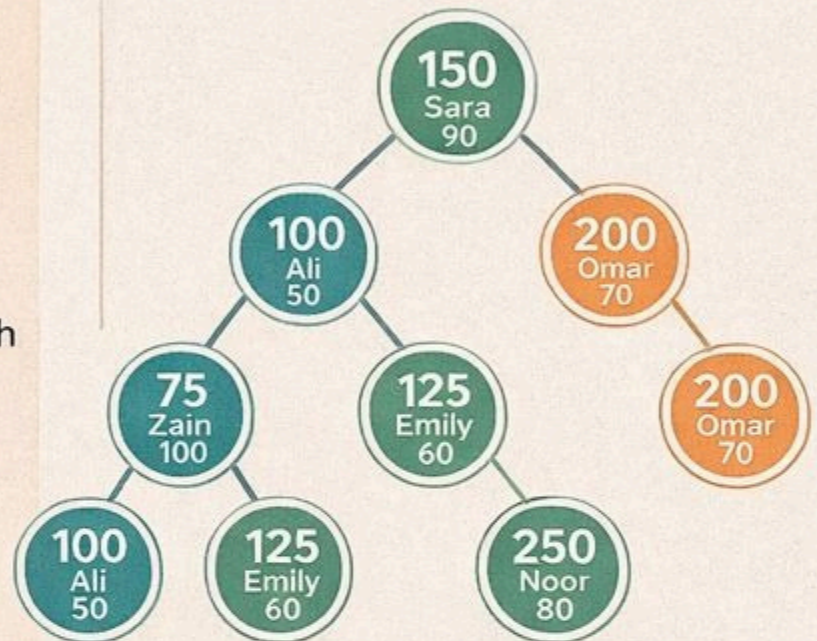


KEY OPERATIONS

- Navigate to the next/previous closest player
- Find the best-matched opponent
- Find K-th smallest player



HOW IT WORKS



- rating: integer key
- name: player's name
- hp: health points



KEY OPERATIONS

• INSERTION (JOIN)

→ Insert players by rating into the BST.
The tree maintains balance and uniqueness.

• DELETION (LEAVE)

→ Remove a player by rating.
The BST structure automatically adjusts.

• NEXT/PREV, MATCH, RANK, KTH & DUEL

- Navigate to the next/previous closest player
- Find the best-matched opponent
- Find the K-th smallest player
- Calculate distance between players