def Tarteeb():

1

DEFINITION

A Segment Tree is a data structure designed for efficient interval queries and updates on array elements. It enables quick range operations like sum, min, max, etc., over specific segments of an array.

2

CHARACTERISTICS

Segment Tree efficiently manages interval queries and updates in arrays, perfect for tasks needing range-based operations like sum, min, or max calculations.

3

OPERATIONS

- Constructions : Recursive contruction divides array into segments, with O(n) time complexity.
- Query : Efficient retrieval for range [L, R] in O(log n) time by exploiting balanced structure.
- Update : Range updates [L, R] in O(log n) time, navigating tre to adjust segment while maintaining integrity.

4

IMPORTANCE

- Efficiently manages dynamic data structures with continuous data streams.
- Computes aggregates values over intervals with logarithmic time complexity.
- Enhances scalability and efficiency in parallel computing, optimizing performance in distributed systems with concurrent operations

5

REAL WORLD USES

- Financial Systems
- Weather Forecasting
- Supply Chain Management
- Game Development

Index - Position of element in segmentTree[]
Range[lb,ub] - Minimum element in the range

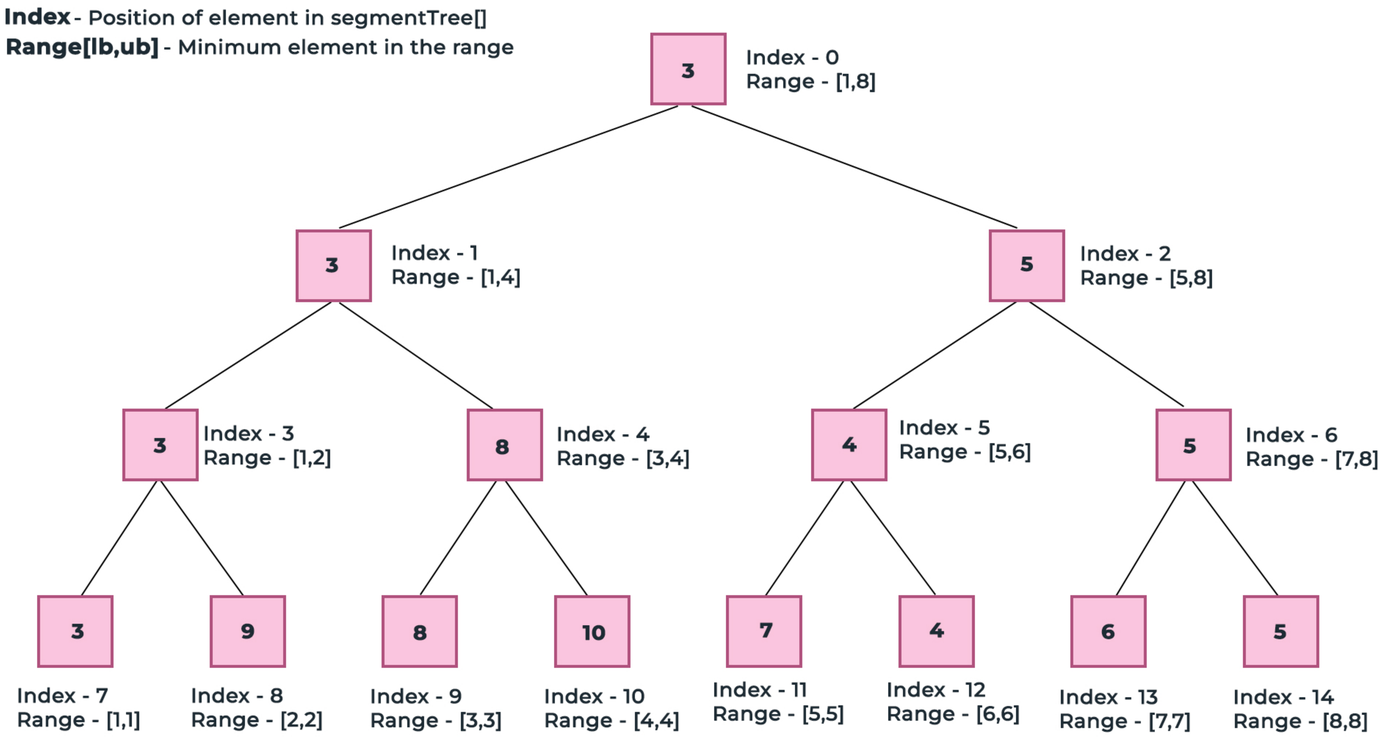

Fig 1.1 An illustration on how segment tree can be used.

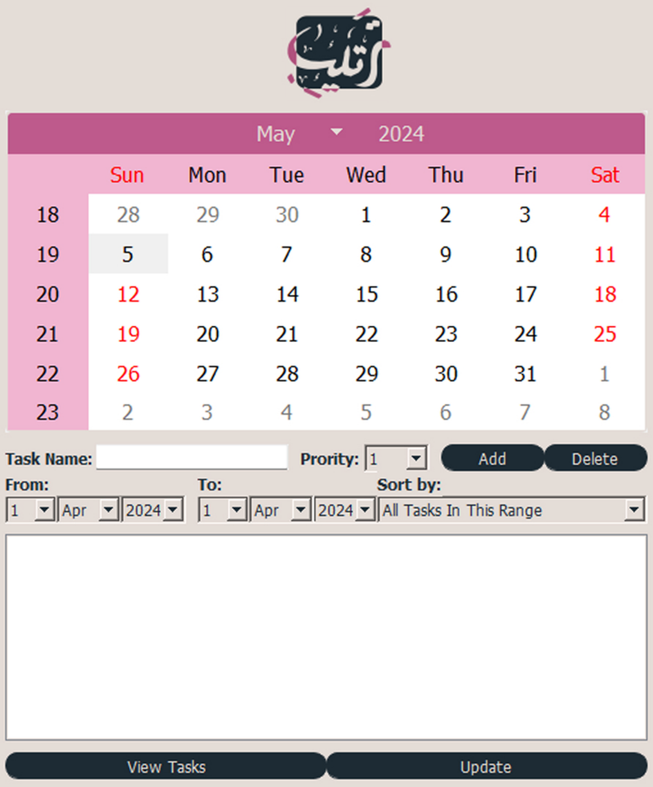

Fig 1.2 A screenshot of the program.