LECTURE 12 : Red-Black Trees

⁶⁶ The one red leaf, the last of its clan, That dances as often as dance it can, Hanging so light, and hanging so high, On the topmost thing that looks up at the sky." - Samuel Taylor Colleridge, Christelad 1797-1800

AVL trees worked by storing an extra lat in each node (height). Red-black trees are also balanced but need only store one extra bit. In practice they are less balanced, but insertion is faster.

> data RBTME a = E > IN Colour (RBihera) a (RBihera)

> dur Colar = R I B

The structure relies on two invarances:

1. Every red node must have a black porent rode. 2. Every path from the root node to a leaf muit have the same number of black nodes.



> member :: Ord a ⇒ a → ROTnue a → Bool Ollogn) when the is balanced.

7 visert :: Ord
$$a \Rightarrow a \rightarrow RBTARe a \rightarrow RBTARe a$$
7 visert $x t = bladeen (nis t)$
7 where
7 vis :: RBTARE $a \rightarrow RBTARE a$
N is :: R













