



a. Insert 80, 35, 20, 100, 25, 30, 45, 40, 50, 37

Remove 35, 25, 30, 45, 80

* Selalu insert dengan warna merah

80

! Root harus Hitam

Ubah saja root menjadi hitam

80

hasil



a. Insert ~~80~~, 35, 20, 100, 25, 30, 45, 40, 50, 37

Remove 35, 25, 30, 45, 80

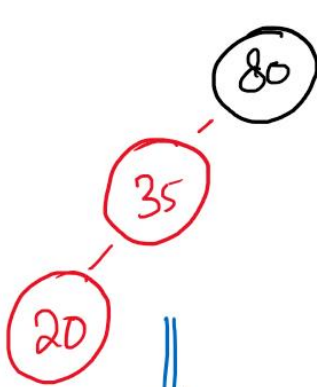
35
80

Tree aman



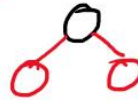
a. Insert ~~80, 35~~, 20, 100, 25, 30, 45, 40, 50, 37

Remove 35, 25, 30, 45, 80

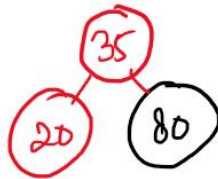


Merah tidak boleh berdekatan

Jika Uncle dari node baru = hitam, rotate dan jadikan

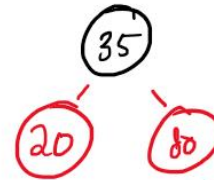


Rotate ke arah uncle (parent)



Ubah atas jadi hitam dan 20 & 80 merah

=>



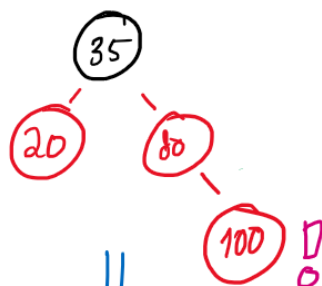
Tree aman



a. Insert ~~80, 35, 20~~, 100, 25, 30, 45, 40, 50, 37

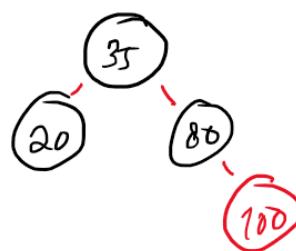
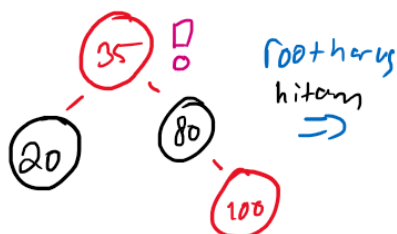


Remove 35, 25, 30, 45, 80



Jika Uncle dari node baru merah, maka ganti warna Grandparent dan anak generasi 1 nya.

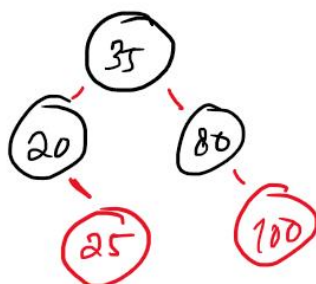
⇓
Ganti warna 35, 20, 80



a. Insert ~~80, 35, 20~~, 100, 25, 30, 45, 40, 50, 37



Remove 35, 25, 30, 45, 80

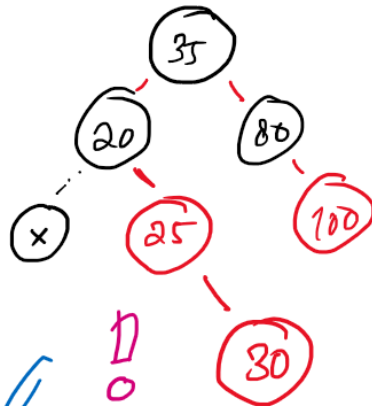


Tree aman

a. Insert ~~80, 35, 20, 100, 25, 30, 45, 40, 50, 37~~

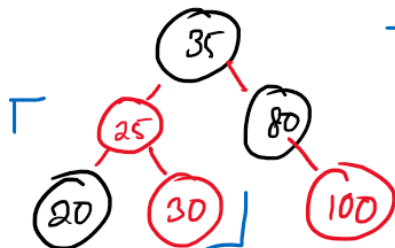


Remove 35, 25, 30, 45, 80

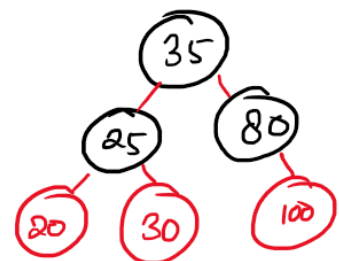


NULL = Hitam

Rotate parent



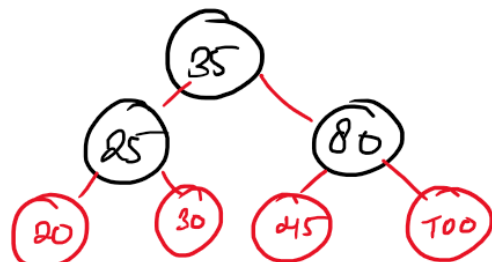
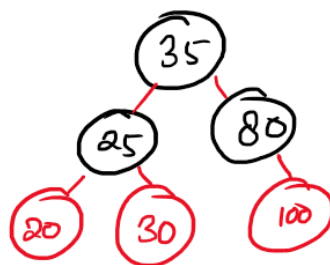
→ Recolor yang dikotak menjadi



a. Insert ~~80, 35, 20, 100, 25, 30, 45, 40, 50, 37~~



Remove 35, 25, 30, 45, 80

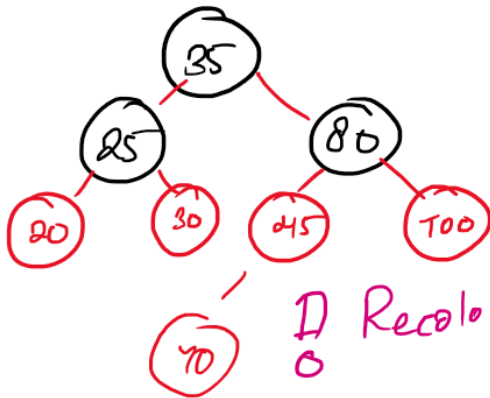


Tree aman

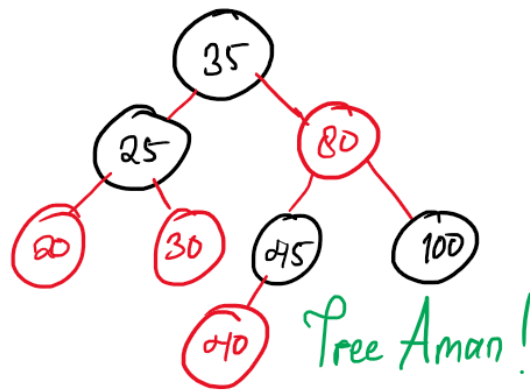
a. Insert ~~80, 35, 20, 100, 25, 30, 45, 40, 50, 37~~



Remove 35, 25, 30, 45, 80



Recolor GP dan anak

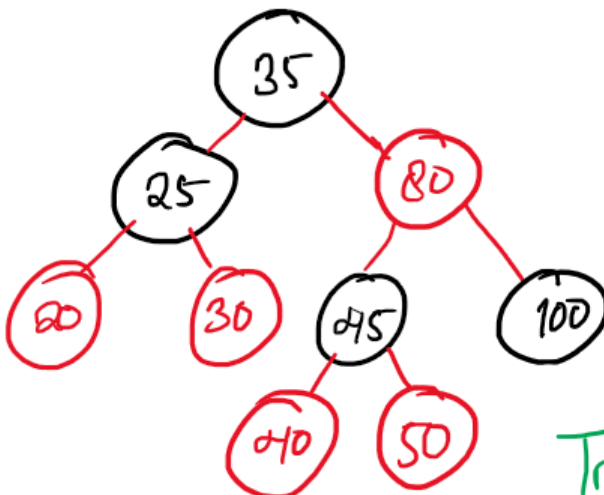


Tree Aman!

a. Insert ~~80, 35, 20, 100, 25, 30, 45, 40, 50, 37~~



Remove 35, 25, 30, 45, 80



Tree aman!

a. Insert ~~80, 35, 20, 100, 25, 30, 45, 40, 50, 37~~

Remove 35, 25, 30, 45, 80

