

# Übungsblatt 10

*Truong, testfran, Zikov*

## Aufgabe 2

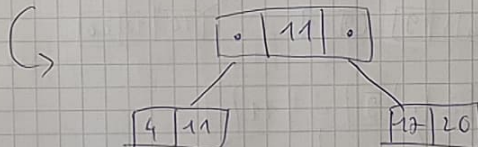
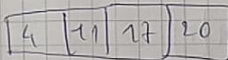
B<sup>+</sup> Baum (3,2)

Murzel: Blatt / hat  $2^{2b-1}$  Kinder  
 Zwischenknoten:  $3^b - 5^{2b-1}$  Kinder  
 Blatt:  $2^{2b-1} - 3$  Kinder Einträge  
 $c$   $2c-1$

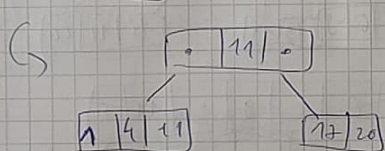
Add 11, 4, 17



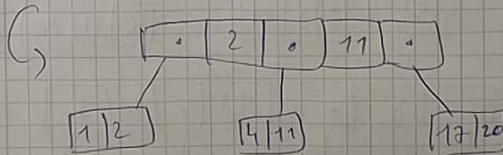
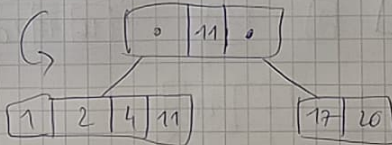
Add 20



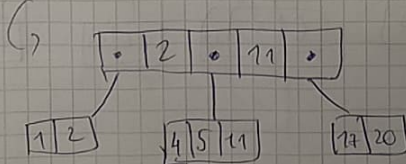
Add 1



Add 2

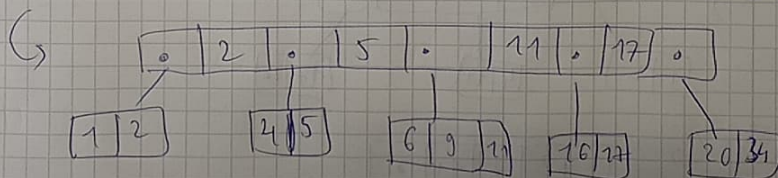
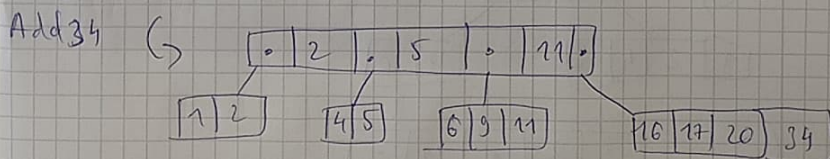
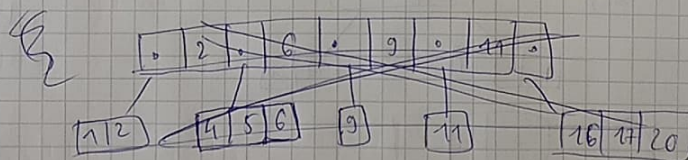
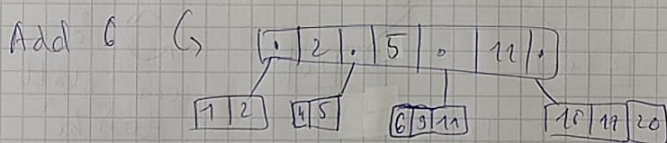
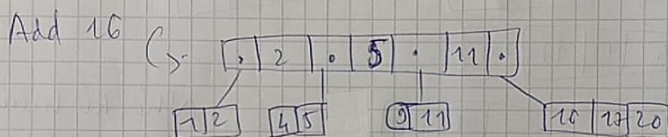
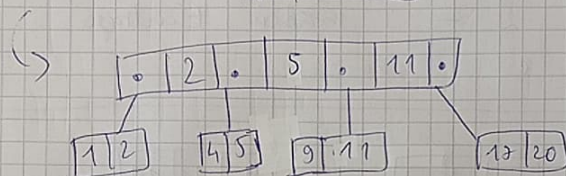
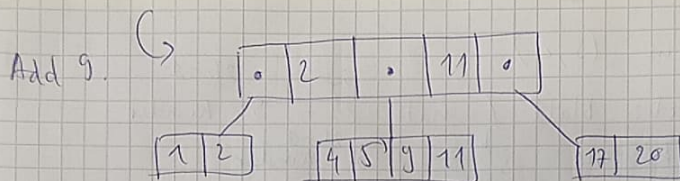


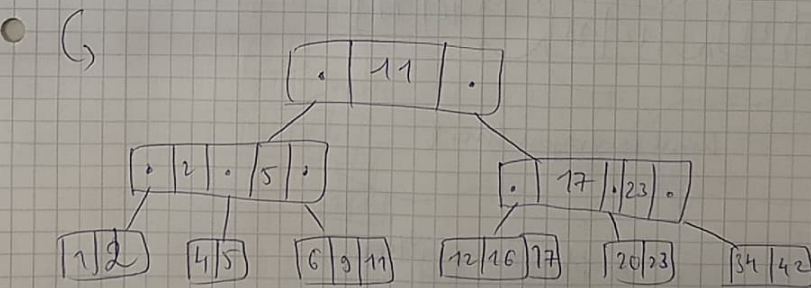
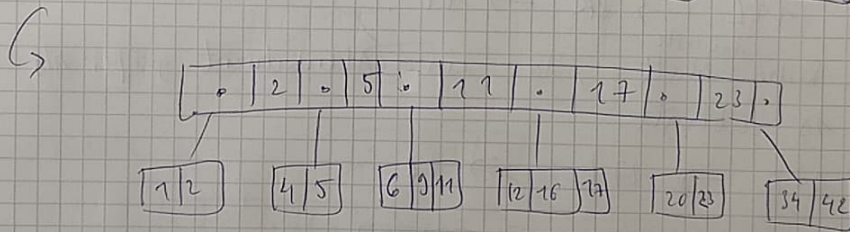
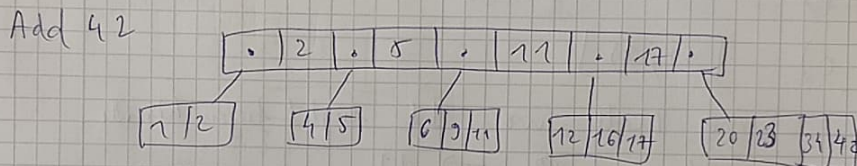
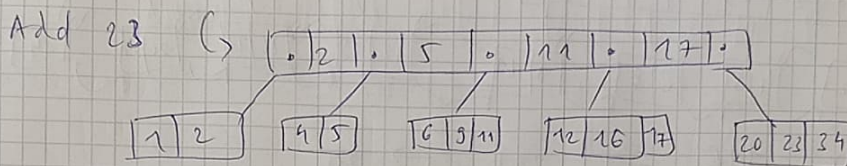
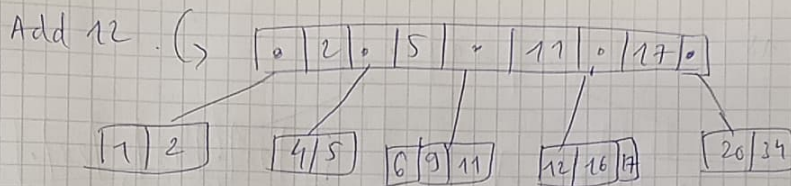
Add 5



Nhỏ kí hiệu

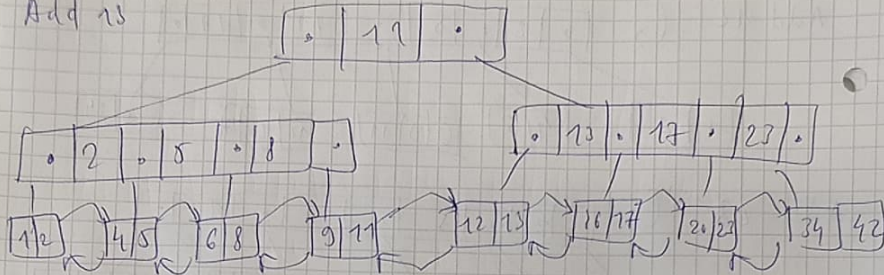
↺ %  
 các Blatt  
 liên kế  
 nhau







Add 15



b)  $11R \rightarrow 23L \rightarrow 20$

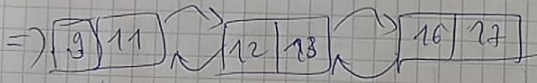
c)  $[11, 15]$

Suche Blatt, wo 11 liegt / liegen könnte.

$11L \rightarrow 8R \rightarrow 11$

Suche <sup>das erste</sup> Blatt, das ein Attributwert größer als 15 enthält:

$11R \rightarrow 17L \rightarrow 16$



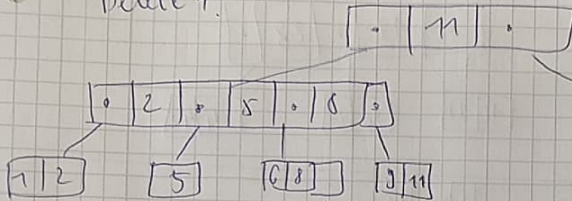
Bereichsanfrageantwort

Zu folgenden Blättern.

d)

Delete 4, 2, 8.

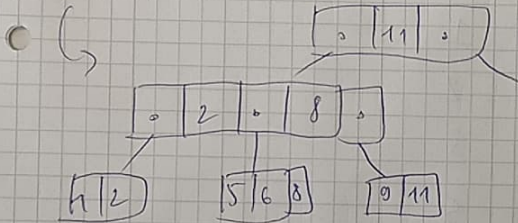
Delete 4.



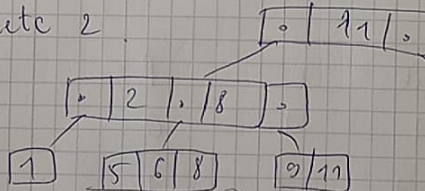
zu wenig Datensätze

$$\frac{3}{2} = 1,5 \approx 2$$

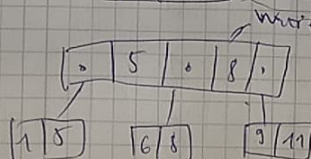
Rechte Knoten nur zur Hälfte gefüllt ist verschmelzen



Delete 2.



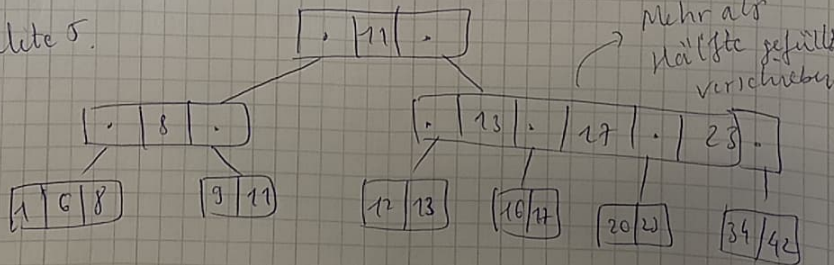
→



verschoben

Rechte Knoten mehr als Hälfte gefüllt ist verschieben

Delete 5.



Mehr als Hälfte gefüllt verschieben

