

- Allgemeine Struktur
- Daten
- Abfragen

```
with recursive t(n) as (  
  values (1)  
  union all  
  select n+1 from t where n < 100  
)  
select sum(n) from t;
```

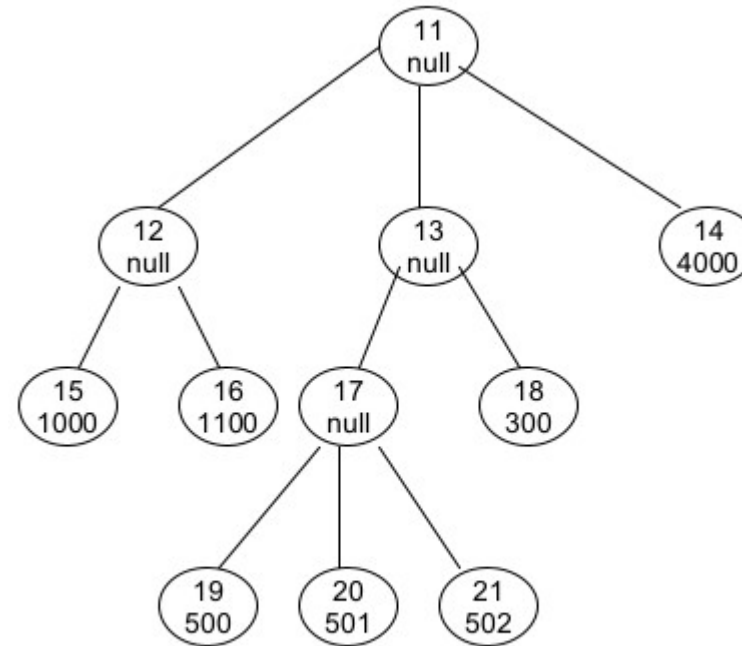
123 sum	↑↓
5.050	

Tabelle tree0

p: Parent

v: Value

123 id	123 p	123 v
11	[NULL]	[NULL]
12	11	[NULL]
13	11	[NULL]
14	11	4.000
15	12	1.000
16	12	1.100
17	13	[NULL]
18	13	300
19	17	500
20	17	501
21	17	502



Werte gibt es nur bei den Blättern

```

with recursive
  tree1(id, p, v, lvl, pth) as (
    select id, p, v, 1, id::varchar(200)
    from tree0
    where p is null
    union all
    select t0.id, t0.p, t0.v, lvl+1, cast(pth || '/' || t0.id as varchar(200))
    from tree0 t0 join tree1 t1 on t0.p=t1.id
  ),
  tree2(id, p, v, lvl, pth, kind) as (
    select
      id, p, v, lvl, pth,
      case
        when lvl=(select min(lvl) from tree1) then 'root'
        when (not exists (select * from tree1 below where below.p =tree1.id))
then 'leaf'
      else 'inner'
      end
    from tree1
  )
select id, p, v, lvl, pth, kind
from tree2
order by lvl
;

```

123 id	123 p	123 v	123 lvl	ABC pth	ABC kind
11	[NULL]	[NULL]	1	11	root
12	11	[NULL]	2	11/12	inner
13	11	[NULL]	2	11/13	inner
14	11	4.000	2	11/14	leaf
15	12	1.000	3	11/12/15	leaf
16	12	1.100	3	11/12/16	leaf
17	13	[NULL]	3	11/13/17	inner
18	13	300	3	11/13/18	leaf
19	17	500	4	11/13/17/19	leaf
20	17	501	4	11/13/17/20	leaf
21	17	502	4	11/13/17/21	leaf

```
with recursive
  tree1(id, p, v, pth) as (
    select id, p, v, cast(id as varchar(200))
    from tree0
    where not exists (select * from tree0 below where below.p =tree0.id)
    union all
    select t0.id, t0.p, t1.v, cast(pth || '/' || t0.id as varchar(200))
    from tree0 t0 join tree1 t1 on t1.p=t0.id
  )
select id, p, v, pth
from tree1
order by id
;
```

```
with recursive
  tree1(id, p, v) as (
    select id, p, v
    from tree0
    where not exists (
      select *
      from tree0 below
      where below.p =tree0.id
    )
    union all
    select t0.id, t0.p, t1.v
    from tree0 t0 join tree1 t1 on t1.p=t0.id
  )
select id, sum(v)
from tree1
group by id
order by id
;
```

123 id	123 sum
11	7.903
12	2.100
13	1.803
14	4.000
15	1.000
16	1.100
17	1.503
18	300
19	500
20	501
21	502

123 id	123 p	123 v	abc pth
11	[NULL]	1.000	15/12/11
11	[NULL]	502	21/17/13/11
11	[NULL]	501	20/17/13/11
11	[NULL]	500	19/17/13/11
11	[NULL]	4.000	14/11
11	[NULL]	300	18/13/11
11	[NULL]	1.100	16/12/11
12	11	1.000	15/12
12	11	1.100	16/12
13	11	300	18/13
13	11	502	21/17/13
13	11	501	20/17/13
13	11	500	19/17/13
14	11	4.000	14
15	12	1.000	15
16	12	1.100	16
17	13	500	19/17
17	13	502	21/17
17	13	501	20/17
18	13	300	18
19	17	500	19
20	17	501	20
21	17	502	21