

Exercice 10

Give the history of the maximum salary

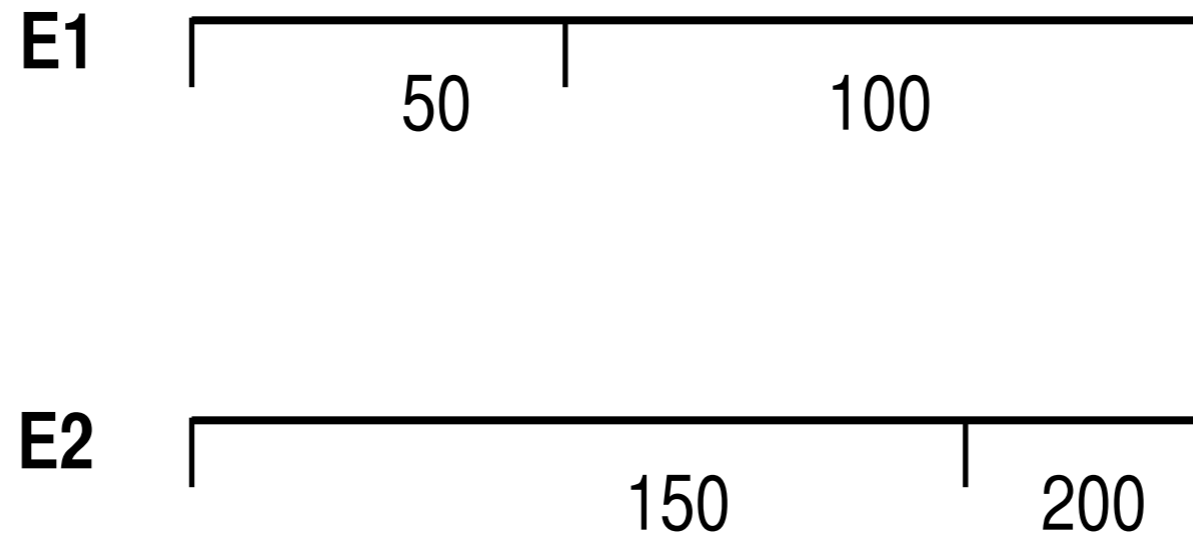
Give the history of the maximum salary

4 steps procedure

1. Find all temporal points of change
2. Build the intervals of constant value
3. Compute the aggregation on each interval
4. Coalesce the result

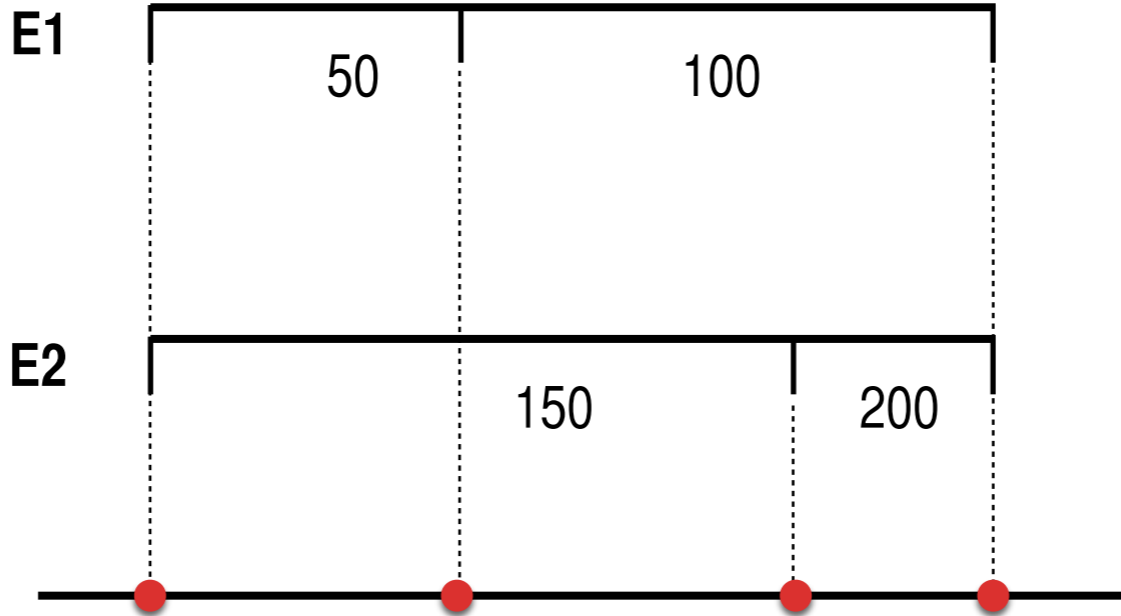
Give the history of the maximum salary

Example



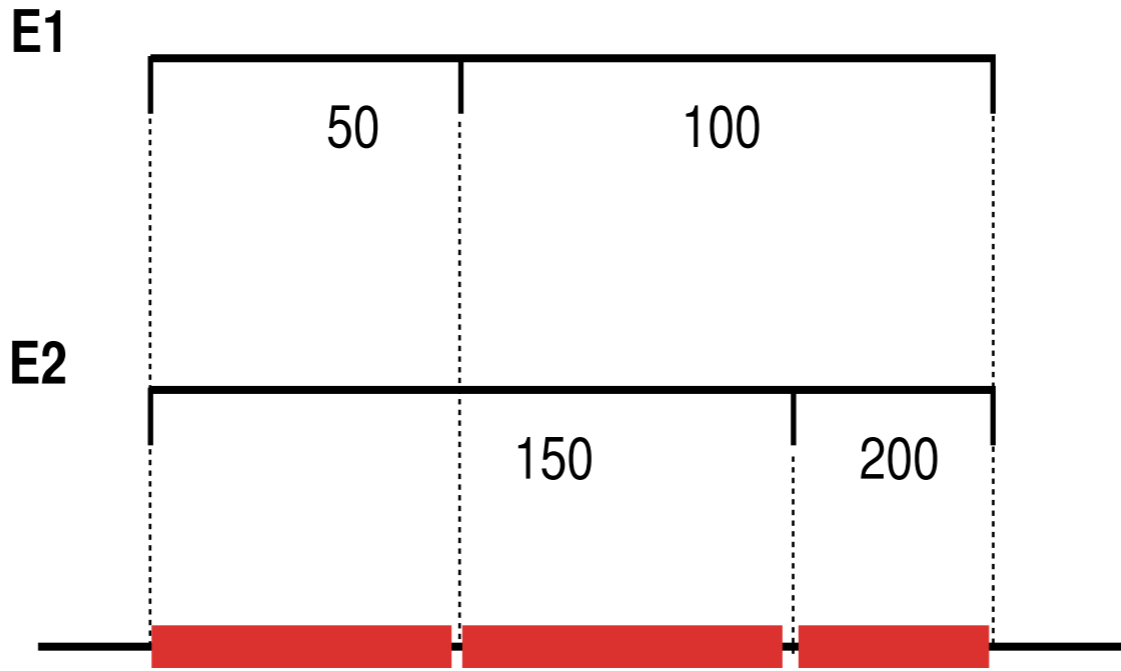
Step 1: Find all temporal points of change

```
Instants(Instant) AS (  
    select distinct E.FromDate  
    from EmployeeSalary E  
union  
    select distinct E.ToDate  
    from EmployeeSalary E ),
```



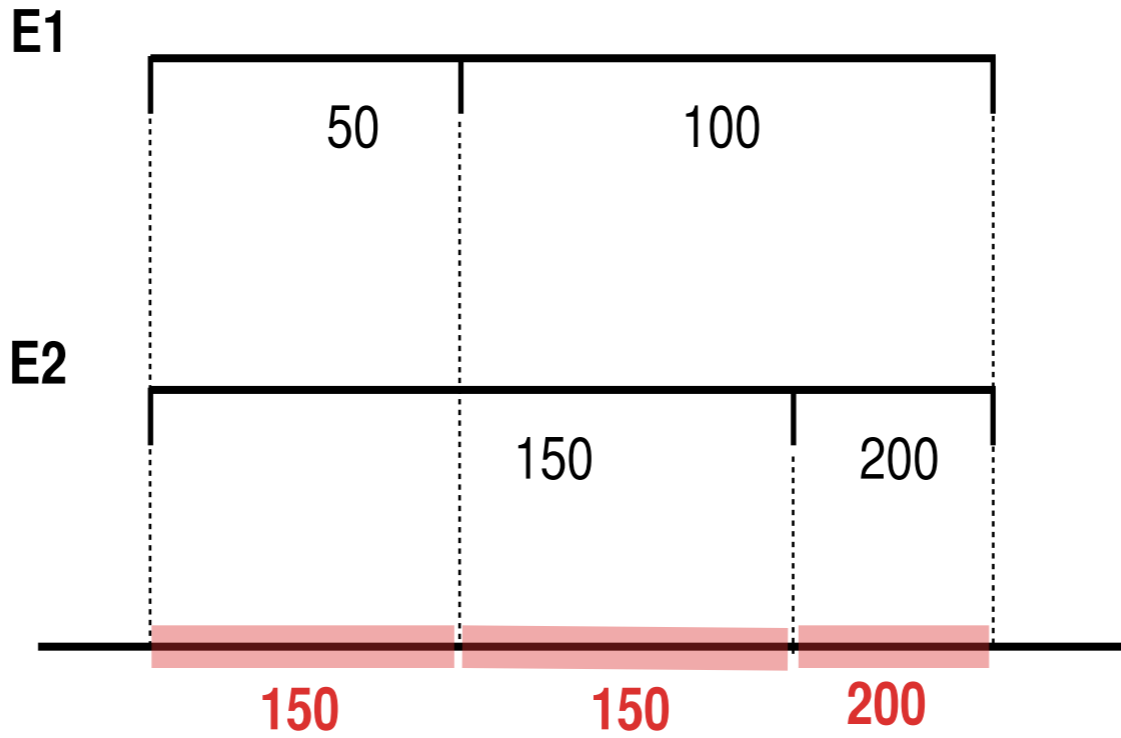
Step 2: Build the intervals of constant value

```
Intervals(FromDate,ToDate) AS (  
    select distinct I1.Instant, I2.Instant  
    from Instants I1,  
         Instants I2  
    where I1.Instant < I2.Instant  
    and not exists ( select *  
                    from Instants I3  
                    where I1.Instant < I3.Instant  
                      and I3.Instant < I2.Instant ) )
```



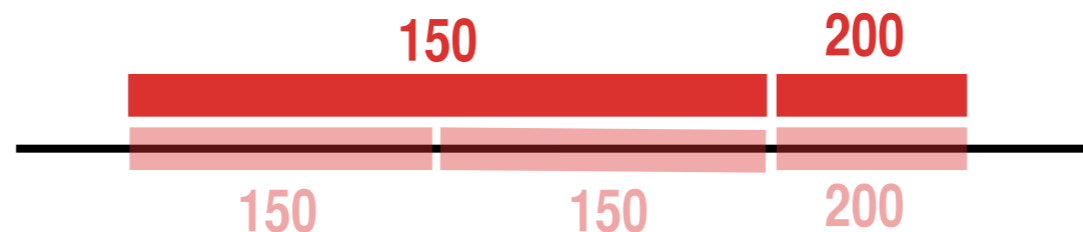
Step 3: Compute the aggregation on each interval

```
TempMax(SalaryMax, FromDate, ToDate) AS (  
  select max(E.Salary), I.FromDate, I.ToDate  
    from EmployeeSalary E,  
         Intervals I  
  where E.FromDate <= I.FromDate  
        and I.ToDate <= E.ToDate  
  group by I.FromDate, I.ToDate )
```



Step 4: Coalesce the result

```
select distinct F.SalaryMax, F.FromDate, L.ToDate
  from #TempMax F, #TempMax L
 where F.FromDate < L.ToDate and F.SalaryMax = L.SalaryMax
    and not exists (
      select *
      from #TempMax M
     where M.SalaryMax = F.SalaryMax
        and F.ToDate < M.FromDate and M.FromDate <= L.FromDate
        and not exists (
          select *
          from #TempMax T1
         where T1.SalaryMax = F.SalaryMax
            and T1.FromDate < M.FromDate and M.FromDate <= T1.ToDate))
    and not exists (
      select *
      from #TempMax T2
     where T2.SalaryMax = F.SalaryMax
        and (T2.FromDate < F.FromDate and F.FromDate <= T2.ToDate)
        or (T2.FromDate <= L.ToDate and L.ToDate < T2.ToDate))
 order by F.FromDate
```



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```
WITH
-- First step: Construct intervals during which no salary change occurred
  Instants(Instant) AS (
    select distinct E.FromDate from EmployeeSalary E
    union select distinct E.ToDate from EmployeeSalary E ),
  Intervals(FromDate,ToDate) AS (
    select distinct I1.Instant, I2.Instant
    from Instants I1, Instants I2
    where I1.Instant < I2.Instant
    and not exists ( select *
                     from Instants I3
                     where I1.Instant < I3.Instant
                       and I3.Instant < I2.Instant ) ),
-- Second step: Compute the maximum salary for these intervals
  TempMax(SalaryMax, FromDate, ToDate) AS (
    select max(E.Salary), I.FromDate, I.ToDate
    from EmployeeSalary E, Intervals I
    where E.FromDate <= I.FromDate and I.ToDate <= E.ToDate
    group by I.FromDate, I.ToDate )
-- Third step: Coalescing the above table
SELECT distinct F.SalaryMax, F.FromDate, L.ToDate
  from TempMax F, TempMax L
 where F.FromDate < L.ToDate and F.SalaryMax = L.SalaryMax
    and not exists ( select *
                     from TempMax M
                     where M.SalaryMax = F.SalaryMax
                       and F.ToDate < M.FromDate and M.FromDate <= L.FromDate
                       and not exists ( select *
                                       from TempMax T1
                                       where T1.SalaryMax = F.SalaryMax
                                         and T1.FromDate < M.FromDate
                                         and M.FromDate <= T1.ToDate ) )

    and not exists ( select *
                     from TempMax T2
                     where T2.SalaryMax = F.SalaryMax
                       and ( ( T2.FromDate < F.FromDate and F.FromDate <= T2.ToDate )
                            or ( T2.FromDate <= L.ToDate and L.ToDate < T2.ToDate ) ) )

order by F.FromDate
```