About measurement

```
explain(analyze, buffers)
select * from pci_patient

Seq Scan on pim_individual
    (cost=0.00..159245.33 rows=2997433 width=472)
    (actual time=0.010..9474.985 rows=2998693 loops=1)
    Buffers: shared hit=31204 read=98067
    I/O Timings: read=8296.828
Planning time: 0.363 ms
Execution time: 9683.454 ms
```

РТЛабс ГРУППА КОМПАНИЙ

```sql
SELECT
  ssrr.id,
  ssrr.appointmentId,
  case when ssrr.appointmentDate::date = now()::date then true else false end,
  ssrr.appointmentDate, now(), ssrr.bdate, ssrr.bdatetime, ssrr.patient_name, ssrr.appointmentState, ssrr.patient_id, ssrr.ticket_number, ssrr.patientCome, ssrr.serviceName, ssrr.sourceName, null, ssrr.citoBadge,
        'тел. ' ||
        coalesce((select value from pim_indiv_contact pic2 where pic2.indiv_id = ssrr.patient_id and is_main = true and pic2.type_id = 2 order by pic2.id ASC limit 1),
        (select value from pim_indiv_contact pic3 where pic3.indiv_id = ssrr.patient_id and pic3.type_id = 2 order by pic3.id ASC limit 1))
    , ssrr.appointmentStateColor, ssrr.isState, ssrr.isHouseCall, ssrr.resourceGroup_id,
    (select mp.id from md_profile mp where code='1'),
    case (select count(*) from table t where t.id = ssrr.patient_id) > 0 then true else false end,
        (select mct.id from mc_case_type mct where code='1'),
```

```
Execution time: 252538.276
I/O Timings: read=184174.054
Buffers: shared hit=1300418 read=2277211
rows=11
```

```sql
    ssr.id AS id,
    a.id AS appointmentId,
    a.bdatetime AS appointmentDate,
    coalesce(s.bdatetime, sf.bdatetime)::date AS bdate,
    to_char(s.bdatetime, 'HH24:MI') AS bdatetime,
    concat_ws(' ', i.surname, i.name, i.patr_name, '(' || to_char(i.birth_dt, 'DD.MM.YYYY') || ')') AS patient_name,
    (case when a.state_id = (select id from md_appointment_state where code = 'RENDERED') then 'Оказана'
    else
    (case when a.queue_state_id = (select id from md_appointment_queue_state where code = 'WAIT') then
    'Ожидает'
    when a.queue_state_id = (select id from md_appointment_queue_state where code = 'CALLED') then 'Вызван'
    when a.queue_state_id = (select id from md_appointment_queue_state where code = 'NOT_RECEIVED') then 'Не явился'
    when a.state_id = (select id from md_appointment_state where code = 'CANCELED') then 'Отменена'
    else ''
    end)
    end) AS appointmentState,
    i.id AS patient_id,
    a.ticket_number AS ticket_number,
    (a.queue_state_id != 4) as patientCome,
    ser.name AS serviceName,
    aps.name AS sourceName,
    a.registration_dt AS registration_dt,
    f.name AS fundingName,
    srg.responsible_id AS employeePosId,
```

Query 1, lack of code style

```sql
SELECT
s.id AS id,   coalesce(s.bdatetime, sf.bdatetime)::date as bdate,
 (select mp.id from md_profile mp where code='1') mp
, (case when s.is_main = true then true else false end) is_main
from sr_session s
 JOIN sr_shift sf ON (s.shift_id = sf.id)
   --left join mc_step ms on msr.step_id = ms.id
inner join sr_timetable_res_group trg on sf.timetable_id=trg.id
   left outer join md_appointment a ON ( st.ticket_id = a.id )

where s.bdate = sf.date1 And s.Edate = sf.date2 and
a.id=sf.app_id
and trg.group_id=(case when a.is_loaded then 1 when a.is_received then 2
 end
)
```

Query 1, lack of code style, register

```sql
SELECT
s.id AS id,  coalesce(s.bdatetime, sf.bdatetime)::date as bdate,
 (select mp.id from md_profile mp where code='1') mp
, (case when s.is_main = true then true else false end) is_main
from sr_session s
 JOIN sr_shift sf ON (s.shift_id = sf.id)
   --left join mc_step ms on msr.step_id = ms.id
inner join sr_timetable_res_group trg on sf.timetable_id=trg.id
   left outer join md_appointment a ON ( st.ticket_id = a.id )

where s.bdate = sf.date1 And s.Edate = sf.date2 and
a.id=sf.app_id
and trg.group_id=(case when a.is_loaded then 1 when a.is_received then 2
 end
)
```

Query 1, lack of code style, spaces

```sql
SELECT
s.id AS id, coalesce(s.bdatetime, sf.bdatetime)::date AS bdate,
 (SELECT mp.id FROM md_profile mp WHERE code='1') mp
, (CASE WHEN s.is_main = TRUE THEN TRUE ELSE FALSE END) is_main
FROM sr_session s
 JOIN sr_shift sf ON (s.shift_id = sf.id)
   --left join mc_step ms on msr.step_id = ms.id
INNER JOIN sr_timetable_res_group trg ON sf.timetable_id=trg.id
   LEFT OUTER JOIN md_appointment a ON ( st.ticket_id = a.id )

WHERE s.bdate = sf.date1 AND s.edate = sf.date2 AND
a.id=sf.app_id
AND trg.group_id=(CASE WHEN a.is_loaded THEN 1 WHEN a.is_received THEN 2
 END
)
```

```sql
SELECT
s.id AS id, coalesce(s.bdatetime, sf.bdatetime)::date AS bdate,
 (SELECT mp.id FROM md_profile mp WHERE code = '1') mp
, (CASE WHEN s.is_main = TRUE THEN TRUE ELSE FALSE END) is_main
FROM sr_session s
 JOIN sr_shift sf ON (s.shift_id = sf.id)
 --left join mc_step ms on msr.step_id
INNER JOIN sr_timetable_res_group trg ON sf.timetable_id = trg.id
   LEFT OUTER JOIN md_appointment a ON ( st.ticket_id = a.id )

WHERE s.bdate = sf.date1 AND s.edate = sf.date2 AND
a.id = sf.app_id
AND trg.group_id = (CASE WHEN a.is_loaded THEN 1 WHEN a.is_received THEN 2
 END
)
```

Query 1, lack of code style, commas

```sql
SELECT
s.id AS id, coalesce(s.bdatetime, sf.bdatetime)::date AS bdate,
 (SELECT mp.id FROM md_profile mp WHERE code = '1') mp
, (CASE WHEN s.is_main = TRUE THEN TRUE ELSE FALSE END) is_main
FROM sr_session s
 JOIN sr_shift sf ON (s.shift_id = sf.id)
INNER JOIN sr_timetable_res_group trg ON sf.timetable_id = trg.id
  LEFT OUTER JOIN md_appointment a ON ( st.ticket_id = a.id )

WHERE s.bdate = sf.date1 AND s.edate = sf.date2 AND
a.id = sf.app_id
AND trg.group_id = (CASE WHEN a.is_loaded THEN 1 WHEN a.is_received THEN 2
 END
)
```

```sql
SELECT
s.id AS id, coalesce(s.bdatetime, sf.bdatetime)::date AS bdate,
  (SELECT mp.id FROM md_profile mp WHERE code = '1') mp,
    (CASE WHEN s.is_main = TRUE THEN TRUE ELSE FALSE END) is_main
FROM sr_session s
 JOIN sr_shift sf ON s.shift_id = sf.id)
INNER JOIN sr_timetable_res_group trg ON sf.timetable_id = trg.id
   LEFT OUTER JOIN md_appointment a ON ( st.ticket_id = a.id )

WHERE s.bdate = sf.date1 AND s.edate = sf.date2 AND
a.id = sf.app_id AND
    trg.group_id = (CASE WHEN a.is_loaded THEN 1 WHEN a.is_received THEN 2
 END
)
```

```sql
SELECT
s.id AS id, coalesce(s.bdatetime, sf.bdatetime)::date AS bdate,
  (SELECT mp.id FROM md_profile mp WHERE code = '1') mp,
   CASE WHEN s.is_main = TRUE THEN TRUE ELSE FALSE END is_main
FROM sr_session s
 JOIN sr_shift sf ON s.shift_id = sf.id
INNER JOIN sr_timetable_res_group trg ON sf.timetable_id = trg.id
   LEFT OUTER JOIN md_appointment a ON st.ticket_id = a.id

WHERE s.bdate = sf.date1 AND s.edate = sf.date2 AND
a.id = sf.app_id AND
    trg.group_id = CASE WHEN a.is_loaded THEN 1 WHEN a.is_received THEN 2
  END
```

Query 1, lack of code style, blocks

```sql
SELECT
  s.id AS id, coalesce(s.bdatetime, sf.bdatetime)::date AS bdate,
 (SELECT mp.id FROM md_profile mp WHERE code = '1') mp,
  CASE WHEN s.is_main = TRUE THEN TRUE ELSE FALSE END is_main
FROM sr_session s
 JOIN sr_shift sf ON s.shift_id = sf.id
 JOIN sr_timetable_res_group trg ON sf.timetable_id = trg.id
  LEFT JOIN md_appointment a ON st.ticket_id = a.id

WHERE s.bdate = sf.date1 AND s.edate = sf.date2 AND
a.id = sf.app_id AND
    trg.group_id = CASE WHEN a.is_loaded THEN 1 WHEN a.is_received THEN 2
  END
```

Query 1, structure

```sql
SELECT
    _columns, _subqueries, _calculations, ...
FROM (
    SELECT _columns, _subqueries, _calculations, ...
    FROM _table1 t1
    JOIN _table2 t2 ON _conditions
    LEFT JOIN _table3 t3 ON _conditions
    ...
    WHERE _conditions
        UNION ALL
    SELECT ...
)
WHERE _conditions
ORDER BY _columns LIMIT _limit
```

```sql
SELECT
   I93737,
   p.id,
   i.surname,
   age(CURRENT_DATE, birth_dt) _age,
   (SELECT mct.id FROM mc_case_type mct WHERE code = '1'),
   (SELECT g.name FROM pim_gender g WHERE g.id = i.gender_id)
     AS _gender
FROM pci_patient p
JOIN pim_individual i ON i.id = p.id
```

Query 1, remove redundant

```sql
SELECT
  CASE
    WHEN _condition = TRUE THEN TRUE
    ELSE FALSE
  END
;




SELECT t.id AS id FROM table1 t;
```

Query 1, simplification

```sql
SELECT i.id FROM pim_individual i
   WHERE
      i.birth_dt >= to_date('2010-01-01', 'yyyy-mm-dd') AND
      i.birth_dt <= now()::DATE;

SELECT
 'address:' || concat(' ' || city, ', ' || street, ', ' ||
      house, ', ' || flat)

FROM indiv_adress;
```

```
SELECT
...
COALESCE(
    (SELECT value FROM pim_indiv_contact pic2
      WHERE pic2.indiv_id = ssrr.patient_id AND pic2.type_id = 2 AND
        is_main
     ORDER BY pic2.id ASC LIMIT 1),
    (SELECT value FROM pim_indiv_contact pic3
      WHERE pic3.indiv_id = ssrr.patient_id AND pic3.type_id = 2
     ORDER BY pic3.id ASC LIMIT 1)
)
FROM (...) ssr
```

Query 1, reduce subqueries count.

```sql
SELECT
...
COALESCE(
    (SELECT value FROM pim_indiv_contact pic2
      WHERE pic2.indiv_id = ssrr.patient_id AND pic2.type_id = 2 AND
         is_main
     ORDER BY pic2.id ASC LIMIT 1),
    (SELECT value FROM pim_indiv_contact pic3
      WHERE pic3.indiv_id = ssrr.patient_id AND pic3.type_id = 2
     ORDER BY pic3.id ASC LIMIT 1)
)
FROM (...) ssr
```

```sql
SELECT

    (SELECT peprg.id FROM sr_res_group srgrg
     LEFT JOIN pim_employee_position peprg ON
        srgrg.responsible_id = peprg.id
     WHERE srgrg.id = ssrr.serviceRendered_resGroupId)

FROM (...) ssr
```

```sql
SELECT

    (SELECT peprg.id FROM sr_res_group srgrg
    LEFT JOIN pim_employee_position peprg ON
        srgrg.responsible_id = peprg.id
    WHERE srgrg.id = ssrr.serviceRendered_resGroupId)

FROM (...) ssr
```

Query 1, to join & raise

```sql
SELECT ...
  FROM sr_session s
  JOIN sr_shift sf ON s.shift_id = sf.id
  JOIN sr_timetable_res_group trg ON sf.timetable_id = trg.id
  LEFT JOIN sr_session_ticket st ON s.id = st.session_id
  LEFT JOIN md_appointment a ON st.ticket_id = a.id
  LEFT JOIN sr_srv_rendered ssr ON a.srv_rendered_id = ssr.id
  LEFT JOIN md_srv_rendered msr ON ssr.id = msr.id
  LEFT JOIN sr_res_group srg ON trg.res_group_id = srg.id
  WHERE srg.id = 56304 AND ssr.id IS NOT NULL
```

Query 1, to join & raise

```sql
SELECT ..
  FROM sr_session s
  JOIN sr_shift sf ON s.shift_id = sf.id
  JOIN sr_timetable_res_group trg ON sf.timetable_id = trg.id
  LEFT JOIN sr_session_ticket st ON s.id = st.session_id
  LEFT JOIN md_appointment a ON st.ticket_id = a.id
  LEFT JOIN sr_srv_rendered ssr ON a.srv_rendered_id = ssr.id
  LEFT JOIN md_srv_rendered msr ON ssr.id = msr.id
  LEFT JOIN sr_res_group srg ON trg.res_group_id = srg.id
  WHERE srg.id = 56304 AND ssr.id IS NOT NULL
```

Query 1, to join & raise

```sql
...
  JOIN md_appointment a ON st.ticket_id = a.id
  JOIN sr_srv_rendered ssr ON a.srv_rendered_id = ssr.id
  LEFT JOIN md_srv_rendered msr ON ssr.id = msr.id
  LEFT JOIN md_appointment_source aps ON aps.id = a.source_id

CREATE TABLE public.md_appointment
(
  ...,
  source_id integer not null
);
```

```
...
  JOIN md_appointment a ON st.ticket_id = a.id
  JOIN sr_srv_rendered ssr ON a.srv_rendered_id = ssr.id
  LEFT JOIN md_srv_rendered msr ON ssr.id = msr.id
  LEFT JOIN md_appointment_source aps ON aps.id = a.source_id

CREATE TABLE public.md_appointment
(
  ...,
  source_id integer not null
);
```

Query 1, join to where

```sql
SELECT mr.id
FROM md_srv_rendered mr
LEFT JOIN mc_case mc ON mr.case_id = mc.id
LEFT JOIN mc_case_type mct ON mct.id = mc.case_type_id
WHERE
(msr.case_id IS NULL OR mct.case_mode_id = 1) AND ...
```

Query 1, join to where

```sql
SELECT mr.id
FROM md_srv_rendered mr
LEFT JOIN mc_case mc ON mr.case_id = mc.id
LEFT JOIN mc_case_type mct ON mct.id = mc.case_type_id
WHERE
(msr.case_id IS NULL OR mct.case_mode_id = 1) AND ...
```

```sql
SELECT
FROM sr_res_group srg
LEFT JOIN sr_res_group srgr ON srgr.group_id = srg.id
 WHERE srgr.resource_id IN (
    SELECT pepr1.id
    FROM pim_employee_position_resource pepr1
    WHERE pepr1.employee_position_id = 93737)
```
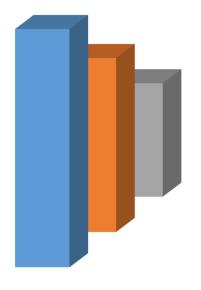
```sql
SELECT
FROM sr_res_group srg
LEFT JOIN sr_res_group srgr ON srgr.group_id = srg.id
 WHERE srgr.resource_id IN (
    SELECT pepr1.id
    FROM pim_employee_position_resource pepr1
    WHERE pepr1.employee_position_id = 93737)
```
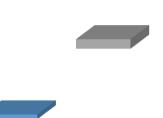
Query 1, before & after

Legend: ■ Execution time ■ I/O read time ■ Buffers read

BEFORE:
- Execution **time:** 252538.276
- I/O Timings: **read**=184174.054
- **Buffers:** shared hit=1300418 **read**=2277211

AFTER:
- Execution **time:** 2505.585
- **Buffers:** shared hit=108600

```
SELECT
j.id,
j.clinic_record_order,
j.date_in,
concat (j.order_report, ' ',
    to_char (j.order_report_date,
j.rec_quantity,
CASE
    WHEN j.is_from_fss IS TRUE THEN (j.rec_quantity - d.count_used_blank)
    ELSE j.rest_quantity
END,
CASE
    WHEN (j.is_from_fss IS NOT TRUE)
    THEN '-'
    ELSE d.count_used_blank::varchar
END,
(
    SELECT
```

BEFORE:
    Execution **time:** 3128.572
    Buffers: shared hit=11763
    rows=26

```sql
SELECT
    j.id,
    j.clinic_record_order,
    j.date_in,
    concat (j.order_report, ' ',
        to_char (j.order_report_date, 'dd.mm.yyyy')),
    j.rec_quantity,
    CASE
        WHEN j.is_from_fss IS TRUE THEN (j.rec_quantity - d.count_used_blank)
        ELSE j.rest_quantity
    END,
    CASE
        WHEN (j.is_from_fss IS NOT TRUE)
        THEN '-'
        ELSE d.count_used_blank::varchar
    END,
    (
    SELECT
        array_to_string (ARRAY (
            SELECT
                CASE
                    WHEN r.end_num IS NULL THEN r.start_num::text
                    ELSE CONCAT (r.start_num, '-',
                        r.end_num)
                END
            FROM
                sickdoc.bso_record_range r
            WHERE
                r.rec_record_id = j.id), '; ')), (
    SELECT
        concat (i.surname, ' ' ||
        LEFT (i.name,
            1)
        || '.', ' ' ||
    LEFT (i.patr_name,
```

Query 2, localization

```sql
select
  exists(
      select from sickdoc.bso_record_range brr
      where
          exists(
              select from sickdoc.sickdoc s
              where
                  clinic_id = 304 and
                  left(s.number, 9) != '' and
                  left(s.number, 9)::bigint between
                      brr.start_num::bigint and
                      coalesce(brr.end_num, brr.start_num)::bigint
      ) and brr.rec_record_id = j.id)
from sickdoc.bso_rec_record j

where
  j.clinic_id = '304'
```

Query 2, localization

```sql
select
  exists(
      select from sickdoc.bso_record_range brr
      where
        exists(
            select from sickdoc.sickdoc s
            where
                clinic_id = 304 and
                left(s.number, 9) != '' and
                left(s.number, 9)::bigint between
                    brr.start_num::bigint and
                    coalesce(brr.end_num, brr.start_num)::bigint
        ) and brr.rec_record_id = j.id)
from sickdoc.bso_rec_record j

where
  j.clinic_id = '304'
```

Query 2, optimization

```
LEFT (s.number, 9)::BIGINT BETWEEN brr.start_num::BIGINT
  AND COALESCE (brr.end_num, brr.start_num)::BIGINT
```

```sql
        FROM
                sickdoc.sickdoc s
        WHERE
                clinic_id = '304'
                AND
        LEFT (s.number, 9)
        != ''
                AND
        LEFT (s.number, 9)::INT BETWEEN brr.start_num::BIGINT
            AND COALESCE (brr.end_num, brr.start_num)::BIGINT
            AND brr.start_num::BIGINT <= 999999999)
            AND brr.rec_record_id = j.id), COALESCE (j.is_from_fss, FALSE)
M
  sickdoc.bso_rec_record j

LEFT JOIN LATERAL (
    SELECT
```
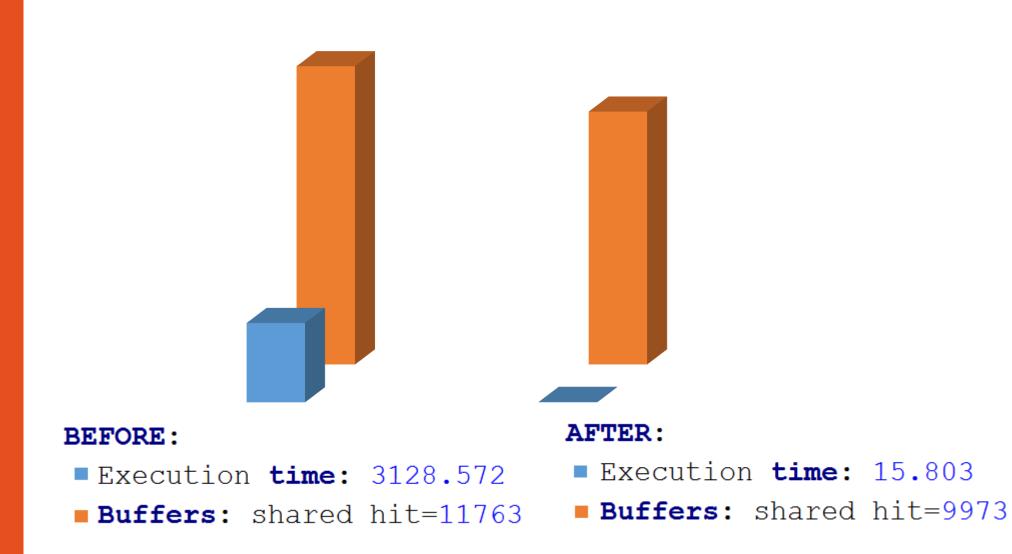
Query 2, before & after

BEFORE:
- Execution **time:** 3128.572
- **Buffers:** shared hit=11763

AFTER:
- Execution **time:** 15.803
- **Buffers:** shared hit=9973

```
SELECT
    receipt1_.id AS col_0_0_,
    COALESCE (organizati16_.SHORT_NAME,
        organizati16_.FULL_NAME) AS col_1_0_,
    receipttyp17_.name AS col_2_0_,
    receipt1_.issue_dt AS col_3_0_,
    patient10_.id AS col_4_0_,
    individual11_.name AS col_5_0_,
    individual11_.surname AS col_6_0_,
    individual11_.patr_name AS col_7_0_,
    individual11_.birth_dt AS col_8_0_,
    fundingsou2_.name AS col_9_0_,
    receiptper3_.name AS col_10_0_,
    receipt1_.series AS col_11_0_,
    receipt1_.number AS col_12_0_,
    diagnosis4_.name AS col_13_0_,
    diagnosis4_.code AS col_14_0_,
    medicalroo6_1_.name AS col_15_0_,
    receipt1_.canceled AS col_16_0_,
    COALESCE (organizati5_.SHORT_NAME,
        organizati5_.FULL_NAME) AS col_17_0_,
    individual9_.id AS col_18_0_,
    individual9_.name AS col_19_0_,
    individual9_.surname AS col_20_0_,
    individual9_.patr_name AS col_21_0_,
    receiptimp0_.id AS col_22_0_,
    receiptimp0_.begin_date AS col_23_0_,
```

BEFORE:

Execution **time:** 1754.404

Buffers: shared hit=1248905

Query 3, localization

```sql
SELECT
    receipt1_.id AS col_0_0_,
    COALESCE (organizati16_.SHORT_NAME,
        organizati16_.FULL_NAME) AS col_1_0_,
    receipttyp17_.name AS col_2_0_,
    receipt1_.issue_dt AS col_3_0_,
    patient10_.id AS col_4_0_,
    individual11_.name AS col_5_0_,
    individual11_.surname AS col_6_0_,
    individual11_.patr_name AS col_7_0_,
    individual11_.birth_dt AS col_8_0_,
    fundingsou2_.name AS col_9_0_,
    receiptper3_.name AS col_10_0_,
    receipt1_.series AS col_11_0_,
    receipt1_.number AS col_12_0_,
    diagnosis4_.name AS col_13_0_,
    diagnosis4_.code AS col_14_0_,
    medicalroo6_1_.name AS col_15_0_,
    receipt1_.canceled AS col_16_0_,
    COALESCE (organizati5_.SHORT_NAME,
        organizati5_.FULL_NAME) AS col_17_0_,
    individual9_.id AS col_18_0_,
    individual9_.name AS col_19_0_,
    individual9_.surname AS col_20_0_,
    individual9_.patr_name AS col_21_0_,
    receiptimp0_.id AS col_22_0_,
    receiptimp0_.begin_date AS col_23_0_,
    receiptimp0_.is_deferred AS col_24_0_,
    receiptimp0_.deferred_date AS col_25_0_,
    (
        SELECT
            md_receipt__get_medicines (receipt1_.id)) AS col_26_0_,
    benefittyp13_.name AS col_27_0_,
    benefitdef14_.name AS col_28_0_,
    receipttyp17_.code AS col_29_0_
FROM
```

Query 3, localization

```sql
select
    md_receipt__get_medicines(r.id)
from
    md_receipt r
    where
        (r.case_id = '43304249'
            or r.step_id in (
                select
                    id
                from
                    mc_step
                where
                    case_id = '43304249'))
```

```
SELECT
    md_receipt__get_medicines(id)
FROM md_receipt
WHERE
    case_id = '43304249' OR
    step_id IN
    (SELECT id FROM mc_step WHERE case_id = '43304249')
```
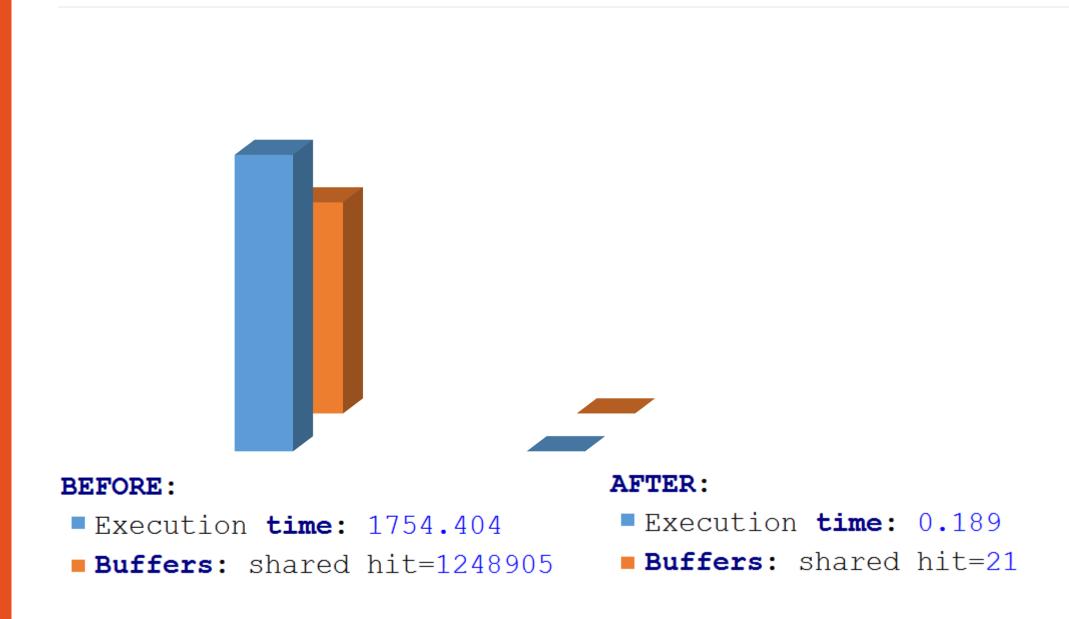
Query 3, all changes

```sql
LEFT OUTER JOIN pim_room medicalroo6_1_ ON medicalroo6_.id = medicalroo6_1_.id
LEFT OUTER JOIN pim_employee_position employeeto7_ ON receipt1_.employee_position_id = employeeto7_.id
LEFT OUTER JOIN pim_employee employee8_ ON employeeto7_.employee_id = employee8_.id
LEFT OUTER JOIN pim_individual individual9_ ON employee8_.individual_id = individual9_.id
LEFT OUTER JOIN pim_party individual9_1_ ON individual9_.id = individual9_1_.id
LEFT OUTER JOIN pci_patient patient10_ ON receipt1_.patient_id = patient10_.id
LEFT OUTER JOIN pim_individual individual11_ ON patient10_.id = individual11_.id
LEFT OUTER JOIN pim_party individual11_1_ ON individual11_.id = individual11_1_.id
LEFT OUTER JOIN pci_benefit benefit12_ ON receipt1_.benefit_id = benefit12_.id
LEFT OUTER JOIN pci_benefit_type benefittyp13_ ON benefit12_.benefit_type_id = benefittyp13_.id
LEFT OUTER JOIN pci_benefit_definition benefitdef14_ ON benefit12_.benefit_def_id = benefitdef14_.id,
md_clinic clinic15_,                                                    😂
pim_organization organizati16_
INNER JOIN pim_party organizati16_1_ ON organizati16_.id = organizati16_1_.id,
    md_receipt_type receipttyp17_
WHERE
    receipt1_.clinic_id = clinic15_.id
    AND clinic15_.id = organizati16_.id
    AND receipt1_.type_id = receipttyp17_.id
    AND (receipt1_.case_id = '43304249'
        OR receipt1_.step_id IN (
            SELECT
                casestep19_.id
            FROM
                mc_step casestep19_
            WHERE
                casestep19_.case_id = '43304249'))
ORDER BY
    receipt1_.id
LIMIT '15';
```

Query 3, before & after

BEFORE:
- Execution **time:** 1754.404
- **Buffers:** shared hit=1248905

AFTER:
- Execution **time:** 0.189
- **Buffers:** shared hit=21

Query 3, comeback

```sql
SELECT
    receipt1_.id AS col_0_0_,
    COALESCE (organizati16_.SHORT_NAME,
        organizati16_.FULL_NAME) AS col_1_0_,
    receipttyp17_.name AS col_2_0_,
    receipt1_.issue_dt AS col_3_0_,
    patient10_.id AS col_4_0_,
    individual11_.name AS col_5_0_,
    individual11_.surname AS col_6_0_,
    individual11_.patr_name AS col_7_0_,
    individual11_.birth_dt AS col_8_0_,
    fundingsou2_.name AS col_9_0_,
    receiptper3_.name AS col_10_0_,
    receipt1_.series AS col_11_0_,
    receipt1_.number AS col_12_0_,
    diagnosis4_.name AS col_13_0_,
    diagnosis4_.code AS col_14_0_,
    medicalroo6_1_.name AS col_15_0_,
    receipt1_.canceled AS col_16_0_,
    COALESCE (organizati5_.SHORT_NAME,
        organizati5_.FULL_NAME) AS col_17_0_,
    individual9_.id AS col_18_0_,
    individual9_.name AS col_19_0_,
    individual9_.surname AS col_20_0_,
    individual9_.patr_name AS col_21_0_,
```

```sql
receiptimp0_.begin_date AS col_23_0_,
receiptimp0_.is_deferred AS col_24_0_,
receiptimp0_.deferred_date AS col_25_0_,
(
    SELECT
        md_receipt__get_medicines (receipt1_.id)) AS col_26_0_,
(
    SELECT
        md_receipt__get_count (receipt1_.id)) AS col_27_0_,
(
    SELECT
        md_receipt__get_form_type(receipt1_.id)) AS col_28_0_,
benefittyp13_.name AS col_29_0_,
benefitdef14_.name AS col_30_0_,
receipttyp17_.code AS col_31_0_
```

```
declare
  element record;
  result text := '';
begin

  for element in
    select coalesce(h.name_trade, i.name_rus) as name
      from md_receipt_medicine m
      left join inv_holding h on h.id = m.holding_id
      left join inv_inn i on i.id = m.inn_id
      where m.receipt_id = md_receipt__get_medicines.id
  loop

    if result <> '' then
      result := result || '; ' || element.name;
    else
      result := element.name;
    end if;

  end loop;

  if result = '' then
    return null;
  end if;

  return result;

end;
```

Make readable, what you need to read

-- *Remove redundant*

Check writings

Reduce queries number

Filter everything **as** early **as** possible

Use knowledges

Play **with** CTE

EXPERIMENT!