QUERY OPTIMIZATION AND UPDATED QUERIES

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Query 1

////////////////////////////////

(select Count(*) as c from `Acceptor Diseases` as A

where A.DiseaseName = 'A') as AD

(select Count(*) as c from `Diseases` as D

where D.DiseaseName = 'A') as DD

This query is already optimized so no changes were made.

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Query 2

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Select DISTINCT(D.DonorID) from `Donor Requests` as D

INNER JOIN `Donor Blood Groups` as DBG

ON DBG.DonorID = D.DonorID,

(Select ABG.BloodGroupID, count(*) as c from

(select * from `Acceptor Requests`

Where ReqDate > '2010-10-12' & ReqDate < '2018-10-12'

) as AR

```
        INNER JOIN  `Acceptor Blood Groups` as ABG
        ON AR.AccID  = ABG.AccID
        Group By ABG.BloodGroupID
        ORDER BY c DESC
        LIMIT 1) as T
where D.ReqDate > '2010-10-12' & D.ReqDate < '2018-10-12'
AND DBG.BloodGroupID = T.BloodGroupID
```

For this query, we added this condition (in bold) before doing the inner join. This made the inner join table smaller which means it consumes less memory and it is easier now to do group by and order by.

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Query 3

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```
Select BGG.BloodGroup from  `BloodGroup` as BGG,
(Select DBG.BloodGroupID, count(*) as c from
        (Select * from `Donor Requests`
        Where ReqDate < '2020-10-01' AND ReqDate > '2015-10-01'
) as DR
INNER JOIN `Donor Blood Groups` as DBG
ON DBG.DonorID = DR.DonorID
GROUP BY DBG.BloodGroupID
ORDER BY c) as B,
(Select DBG.BloodGroupID, count(*) as c from `Blood Drive` as BD
```

INNER JOIN `Blood Drive Collection` as BDC

ON BDC.DriveID = BD.ID

INNER JOIN `Donor Blood Groups` as DBG

ON BDC.DonorID = DBG.DonorID

AND BD.DriveDate < '2020-10-01' AND BD.DriveDate > '2015-10-01'

GROUP BY DBG.BloodGroupID

ORDER BY c) as D

where B.c < D.c and B.BloodGroupID = D.BloodGroupID

AND BGG.ID = B.BloodGroupID

For this query, first we added the condition to the donor request table, so that the inner join table would be smaller. Secondly, as the inner join between Blood drive and Blood drive Collection is smaller than the inner join of Blood Drive collection and Donor Blood Groups, we decided to do the first one to improve efficiency.

//////////////////////////

Query 4

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Select D.DonorName ,D.ID from Donor as D, `Donor Blood Groups` as DBG, `BloodGroup` as BG

where D.Sex = 'F'

AND D.ID = DBG.DonorID

AND BG.ID = DBG.BloodGroupID

AND BG.BloodGroup = 'A+'

This query is already optimized so no change.

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Query 5

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Select BG.BloodGroup,Count(*) as c from

(Select * from `Blood Sample`

where BS.BloodBankID = 1

) as BS

INNER JOIN `Donor Blood Groups` as DBG

ON DBG.DonorID = BS.DonorID

INNER JOIN `BloodGroup` as BG

ON BG.ID = DBG.BloodGroupID

GROUP BY DBG.BloodGroupID

ORDER BY c DESC

LIMIT 1

In this query, we added the condition in the Blood sample so that the inner joined table would be small and it would take less time to do group by and order by.

//////////////////////

Query 6

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Select A.AccName, A.ID

from Acceptor as A

```
where
        (Select MAX(count)
        from (Select B.AID as ID, count(*) as count from
                        (Select BI.AccID as AID, BS.DonorID as DID from `Blood Sample` as
BS
                        Inner Join `Blood Issued` as BI
                        ON BS.SampleID = BI.SampleID) as B
                        Group by B.AID , B.DID
                ) as X
        where A.ID = X.ID) > 2;
```

This query is optimized so no change.

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Query 7

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```
Select AR.AccID from `Acceptor Requests` as AR,
        (Select * from Acceptor as A, `Acceptor Diseases` as AD
                where  AD.AccID = A.ID
                and
                (Select Count(*) from `Blood Issued` as BI
                where BI.AccID = A.ID ) <= 1
        ) as X
where
        X.ID = AR.AccID
        and
        (Select MAX(Y.count) from
                (Select AcR.AccID as ID, Count(*) as count
```

```
        from `Acceptor Requests` as AcR
        Group by AcR.AccID) as Y
    where X.ID = Y.ID) = (Select Count(*) from `Acceptor Requests` as B where B.AccID = AR.AccID)
```

In this query, we removed the nested select and converted it into a single select query.

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Query 8

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```
Select A.Bgroup , IFNULL(A.S+B.S,0) as count
from
(Select BG.BloodGroup as Bgroup , sum(Z.Count) as S
from Donor as D
INNER JOIN
    (Select AD.CarrierID as ID, Count(*) as Count from `Diseases` as AD
    Group BY AD.CarrierID ) as Z
ON Z.ID = D.ID
INNER JOIN `Donor Blood Groups` as ABG
ON ABG.DonorID = D.ID
INNER JOIN BloodGroup as BG
ON ABG.BloodGroupID = BG.ID
Group By BG.BloodGroup)  as A

inner join
```

```
(Select BG.BloodGroup as Bgroup, sum(D.Count) as S
from Acceptor as A
INNER JOIN
        (Select AD.AccID as ID, Count(*) as Count from `Acceptor Diseases` as AD
        Group BY AD.AccID ) as D
ON D.ID = A.ID
INNER JOIN `Acceptor Blood Groups` as ABG
ON ABG.AccID = A.ID
INNER JOIN BloodGroup as BG
ON ABG.BloodGroupID = BG.ID
Group BY BG.BloodGroup) as B

ON B.Bgroup = A.Bgroup

ORDER BY count DESC
LIMIT 1
```

This query is already optimized so no change.

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Query 9

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```
Select C.BloodGroup from BloodGroup as C,
```

```
        (Select DBG.BloodGroupID,count(*) as c from `Blood Drive Collection` as BDC
        INNER JOIN `Donor Blood Groups` as DBG
        ON BDC.DonorID = DBG.DonorID,
                (Select BD.ID from `Blood Drive` as BD
                ORDER BY BD.DriveDate DESC
                LIMIT 1) as X
        where X.ID = BDC.DriveID
        Group BY DBG.BloodGroupID) as A,

        (Select DBG.BloodGroupID,count(*) as c from `Blood Drive Collection` as BDC
        INNER JOIN `Donor Blood Groups` as DBG
        ON DBG.DonorID = BDC.DonorID,
                (Select BD.ID from `Blood Drive` as BD
                ORDER BY BD.DriveDate DESC
                LIMIT 1,1) as Y
        where Y.ID = BDC.DriveID
        Group BY DBG.BloodGroupID) as B

where C.ID = A.BloodGroupID
AND   A.BloodGroupID = B.BloodGroupID
AND   ((B.c - A.c) /B.c ) *100 >= 10
```

This query is optimized so no change.

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Query 10

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```
Select AVG(RD.age) as average from
    (Select DISTINCT(DonorID), YEAR(CURDATE()) - YEAR(DateOfBirth) AS age from
`Blood Sample` as BS
    INNER JOIN Donor as D
    ON D.ID = BS.DonorID) as RD
```

```
Select AVG(DD.age) as average from
    (Select DISTINCT(DonorID), YEAR(CURDATE()) - YEAR(DateOfBirth) AS age from
`Blood Drive Collection` as BS
    INNER JOIN Donor as D
    ON D.ID = BS.DonorID) as DD
```

This query is already optimized so no change.