Queries and Optimization Project: Team 11-D3-D

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Part a: SQL queries

FH and FC per month, filtered by the aircraft model:

```
SELECT f.FLIGHTHOURS AS "FH", f.FLIGHTCYCLES AS "FC",
f.MONTHID AS "MONTHID"
FROM FACTS_DRILLACCROSS f, AircraftDimension a
WHERE f.AIRCRAFTID = a.ID AND a.MODEL = '777'
GROUP BY f.FLIGHTHOURS, f.FLIGHTCYCLES, f.MONTHID;
```

ADOSS, ADOSU per year, filtered by the aircraft from the fleet:

```
SELECT f.SCHEDULEDOUTOFSERVICE AS "ADOSS",
f.UNSCHEDULEDOUTOFSERVICE AS "ADOSU", m.y as "Year"
FROM FACTS_DRILLACCROSS f, Months m, AircraftDimension a
WHERE f.MONTHID = m.ID AND a.ID = f.AIRCRAFTID AND a.ID = 'XY-WTR'
GROUP BY f.SCHEDULEDOUTOFSERVICE, f.UNSCHEDULEDOUTOFSERVICE, m.y;
```

RRh, RRc, PRRh, PRRc, MRRh and MRRc per month, filtered by the aircraft model:

```
SELECT   F1.RRh, F1.RRc, F1.PRRh, F1.PRRc, F1.MRRh, F1.MRRc, F1.
   MONTHID
FROM   (SELECT (f.PIREP + f.MAREP) / f.FLIGHTHOURS AS RRh,
               (f.PIREP + f.MAREP) / f.FLIGHTCYCLES AS RRc,
               f.PIREP / f.FLIGHTHOURS AS PRRh,
               f.PIREP / f.FLIGHTCYCLES AS PRRc,
               f.MAREP / f.FLIGHTHOURS AS MRRh,
               f.MAREP / f.FLIGHTCYCLES AS MRRc,
               f.MONTHID  AS "MONTHID",
               f.AIRCRAFTID AS "AIRCRAFTID"
        FROM   FACTS_DRILLACCROSS f
        GROUP BY  (f.PIREP + f.MAREP) / f.FLIGHTHOURS,
                  (f.PIREP + f.MAREP) / f.FLIGHTCYCLES,
                  f.PIREP / f.FLIGHTHOURS,
                  f.PIREP / f.FLIGHTCYCLES,
                  f.MAREP / f.FLIGHTHOURS,
                  f.MAREP / f.FLIGHTCYCLES,
                  f.MONTHID,
                  f.AIRCRAFTID) F1,
                  AircraftDimension a
WHERE  F1.AIRCRAFTID = a.ID
       AND a.MODEL = '777'
GROUP BY F1.RRh, F1.RRc, F1.PRRh, F1.PRRc, F1.MRRh, F1.MRRc, F1.
   MONTHID;
```

MRRh and MRRc per aircraft model, filtered by the airport of the reporting person:

```
SELECT    F1.MRRh, F1.MRRc, a.MODEL
FROM    (SELECT f.MAREP / f.FLIGHTHOURS AS MRRh,
                f.MAREP / f.FLIGHTCYCLES AS MRRc,
                f.MONTHID  AS "MONTHID",
                f.PERSONID AS "PERSONID",
                f.AIRCRAFTID AS "AIRCRAFTID"
         FROM    FACTS_DRILLACCROSS f
         GROUP BY  f.MAREP / f.FLIGHTHOURS,
                   f.MAREP / f.FLIGHTCYCLES,
                   f.MONTHID,
                   f.PERSONID,
                   f.AIRCRAFTID) F1,
                   AircraftDimension a,
                   peopledimension p
WHERE  F1.AIRCRAFTID = a.ID
     AND F1.PERSONID = p.id
       AND p.AIRPORT = 'KRS'
GROUP BY F1.MRRh, F1.MRRc, a.MODEL;
```

Part b: Optimization

In term of optimization the queries, we choosed this indexes:

1.CREATE INDEX index1 ON AIRCRAFTDIMENSION (model,manufacturer) PCTFREE 33;

We created a B+ index for AircraftDimension to the atributtes model and manufacturer because a Bitmap requires more repeated values and in terms to be faster for the query to search over this table.

2.CREATE INDEX index2 ON PEOPLEDIMENSION (role) PCTFREE 33;

We created a B+ index for PeopleDimension on Role, to split between P and M because a Bitmap requires more repeated values and get faster results.

3.CREATE BITMAP INDEX index4 ON AIRCRAFTUTILIZATION (AIRCRAFTID,cancellations) PCTFREE 0;

We created a Bitmap Index on AricraftUtilization because AircraftId has a lot of duplicates value as well as cancellations and this will make the querys much faster.

4.CREATE BITMAP INDEX index3 ON LOGBOOKREPORTING (AIRCRAFTID) PCTFREE 0;

We created a Bitmap Index on LogBookReporting in AircraftID because this attributes has a lot of duplicates in it's values.

And finally, We only used 1880 disk blocks overall (including data and indexes)