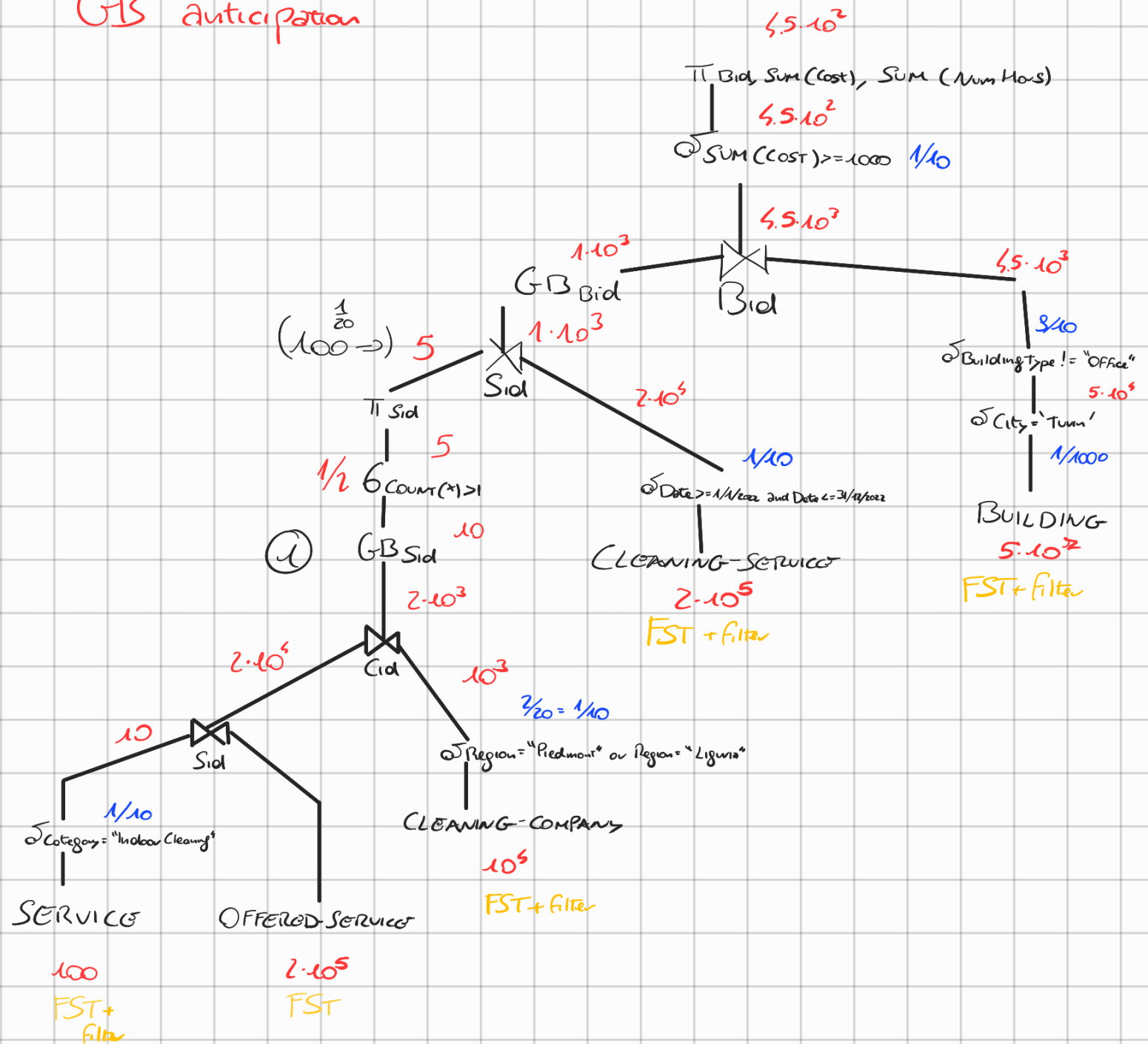


GB anticipation



The anticipation of group by is possible because the join attribute and GB attribute are the same set. (BID)

②

To increase query performance I would implement:

- Look what is in orange (first page)

Access path without indexes

Service : The physical access structure is full scan table + Filter

Offered-Service : The physical access structure is full scan table

Cleaning Company : The physical access structure is full scan table + Filter

Cleaning Service : The physical access structure is full scan table + Filter

Building : The physical access structure is full scan table + Filter

Join

- The join SID between SERVICE and OFFERED-SERVICE is performed using nested loop algorithm where Service is the inner table and OFFERED-SERVICE is the outer one.
- The join CID is performed using hash join algorithm
- The join BID is performed using hash join algorithm

Group by

the GB SID will be no hash based Since we considered an hash solution on join and a local sort was already provided

the GB BID will be no hash based ~ //

Indexes

- Building : Secondary hash index on City since 1/1000 is a good factor of reduction

Access path indexes

Building : The physical access structure is index range scan + access by random.

Even though the reduction factor $\frac{1}{10}$ of Date (Cleaning Service) and Region (Cleaning Company). I didn't select proper indexes because, as we considered on lecture, it was on the threshold whether considering it as a good or bad reduction Factor.