

Esercizio sulle viste materializzate

Dato il seguente schema relazionale di un data mart

```
INCOME (LID, SID, CID, TID, #Consulting, Income)
SERVICE (SID, Service, ServiceType, ServiceCategory)
TIME (TID, Date, Month, 2M, 3M, 4M, 6M, Year)
LOCATION (LID, Headquarter, City, Region, Geographic_Area, #Consultants)
COMPANY (CID, ServiceCategory, CompanyType, Nationality)
```

Define the query in SQL associated with the materialized view that can be used to efficiently answer all three of the following queries:

- For each type of services and semester, select the total income and the total number of consulting, carried out by the consultants of the offices located in Lombardy.
- Considering only Italian and German companies, select for each region and service, the total income and the total number of consulting, separately for each year.
- Considering only the income of 2017, 2018, and 2019, for each service category and company nationality, select the six-month income and the average six-month income per consulting.

Considering the following statistics:

- Time period: 10 years
- Number of services ± 100
- Number of types ± 10
- Number of companies ± 200
- Number of headquarters ± 90
- Number of Nationalities ± 5
- Number of Region ± 10

DRAFT SOLUTION

- 1)

```
SELECT ServiceType, 6M,
SUM(Income), SUM(#Consulting)
FROM INCOME I, SERVICE S, TIME T, LOCATION L
WHERE I.SID=S.SID AND I.TID=T.TID AND I.LID=L.LID
AND Region='Lombardy'
GROUP BY ServiceType, 6M
```
- 2)

```
SELECT Region, Service, year, SUM(Income), Sum(#Consulting)
FROM INCOME I, SERVICE S, TIME T, LOCATION L, COMPANY C
WHERE I.SID=S.SID AND I.TID=T.TID AND I.LID=L.LID AND I.CID=C.CID
AND (Nationality='Italian' OR Nationality='German')
GROUP BY Region, Service, year
```

```
3) SELECT ServiceCategory, Nationality, 6M,
SUM(Income),
SUM(Income)/SUM(#Consulting)
FROM INCOME I, SERVICE S, TIME T, COMPANY C
WHERE I.SID=S.SID AND I.TID=T.TID AND I.CID=C.CID
year >=2017 AND year <=2019
GROUP BY ServiceCategory, Nationality, 6M
```

Materialized View

```
SELECT 6M, year, Service, ServiceType, ServiceCategory, Region, Nationality
SUM(Income) AS Tot_income, SUM(#Consulting) AS Num_consulting
FROM INCOME I, SERVICE S, TIME T, COMPANY C, LOCATION L
WHERE I.SID=S.SID AND I.TID=T.TID AND I.CID=C.CID AND I.LID=L.LID
GROUP BY 6M, year, Service, ServiceType, ServiceCategory, Region, Nationality;
```

Cardinalities:

Materialized view: $20 \cdot 100 \cdot 10 \cdot 5 = 10^5$

Fact table: $90 \cdot 100 \cdot 200 \cdot 365 \cdot 10 \approx 6 \cdot 10^9$