



Optimizer

Exercises

Exercise 1

- The following relations are given (primary keys are underlined):
 - STUDENT(StudentCode, Name, Surname, Birthdate)
 - EXAM(StudentCode, CourseExam, Date, Score)
- Assume the following cardinalities:
 - $\text{card}(\text{STUDENT}) \approx 10^4$ tuple
 - $\text{card}(\text{EXAM}) \approx 3 * 10^5$ tuple
 - $\text{MIN}(\text{EXAM.Score}) = 1$
 - $\text{MAX}(\text{EXAM.Score}) = 30$
 - Selectivity $\text{HAVING AVG}(\text{Score}) \geq 26$ equal to $\frac{1}{50}$

Query 1

```
SELECT E.StudentCode, Name, AVG(Score)
FROM EXAM E, STUDENT S
WHERE E.StudentCode = S.StudentCode
and Score ≥ 18
GROUP BY E.StudentCode, Name
HAVING AVG(Score) ≥ 26
ORDER BY E.StudentCode;
```

Exercise 2

- The following relations are given (primary keys are underlined):
 - EMPLOYEE (EmpId, EmpName, BirthDate)
 - PROJECT(ProjCode, ProjName, StartDate, EndDate, Centre, Budget)
 - WORK_ON(EmpId, ProjCode, StartDate, EndDate, Status)
- Assume the following cardinalities:
 - $\text{card}(\text{EMPLOYEE}) \approx 10^4$ tuples
 - $\text{MIN}(\text{EMPLOYEE.BirthDate}) = 1/1/1950$
 - $\text{MAX}(\text{EMPLOYEE.BirthDate}) = 31/12/1990$
 - $\text{card}(\text{PROJECT}) \approx 10^3$ tuples
 - PROJECT.Centre has 10 distinct values
 - $\text{card}(\text{WORK_ON}) \approx 5 * 10^4$ tuples

Query 1

```
SELECT ProjName, COUNT(*)
FROM EMPLOYEE E, PROJECT P, WORK_ON W
WHERE W.EmpId = E.EmpId
and W.ProjCode = P.ProjCode
and Centre = 'Torino'
and BirthDate ≥ 1970
GROUP BY P.ProjCode, ProjName
HAVING COUNT(*) > 10;
```