Big Data Engineering: Assignment 3

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1

Relational Algebra and SQL

Subproblem 2

Translate the following SQL queries into relational algebra expressions. If possible, replace Cartesian products with joins:

1.
$$\sigma_{city<>'Saarbrücken'}(libraries \bowtie_{lid=libraries} (membership \bowtie_{member=mid} members))$$

2.
$$R_1 := members \bowtie_{favorite\_author=aid} (\sigma_{salary>2000}authors)$$

$$R_2 := \sigma_{sum(late\_fees)=100}(\gamma_{reservation\_date,sum(late\_fees)}(reserve \bowtie_{member=mid} R_1))$$

$$\gamma_{avg(late\_fees)}R_2$$