

# Huiswerk Databases 1

## 2021-2022

We have the following database scheme.

```
Movie ( movid, title, company, year, director )
Actor ( actid, naam, birthdate)
Performs ( movid, actid, character )
```

We don't have NULL-values. For simplicity, we suppose each movie has one (prime) director.

Below you see some queries in natural language and some RA-expressions. We abbreviate the relation names to their first letter. The relational division is denoted with a %.

The question is: which queries correspond to which expressions? The relationship between queries and expressions is possibly many-to-many and optional.

Q1: Which actors played only in movies from 1930 or before.

Q2: Which actors played in a movie from 1930 or before, and also in a movie which appeared after 1930.

Q3: Give the actors who played in every movie made by director Bigelow between 2008 and 2012.

E1:  $\pi_{actid}(\sigma_{year \leq 1930}(M) \bowtie P)$

E2:  $\pi_{actid}(\sigma_{(year \leq 1930) \vee (year > 1930)}(M) \bowtie P)$

E3:  $\pi_{actid}(M \bowtie P)$

E4:  $\pi_{actid}(A) - \pi_{actid}(\sigma_{year > 1930}(M) \bowtie P)$

E5:  $\pi_{actid}(\sigma_{year \leq 1930}(M) \bowtie P) \cup \pi_{actid}(\sigma_{year > 1930}(M) \bowtie P)$

E6:  $\pi_{actid}(\sigma_{year \leq 1930}(M) \bowtie P) \cap \pi_{actid}(\sigma_{year > 1930}(M) \bowtie P)$

E7:  $\pi_{actid}(\sigma_{year \leq 1930}(M) \bowtie P) \bowtie \pi_{actid}(\sigma_{year > 1930}(M) \bowtie P)$

E8:  $\pi_{actid}(P \bowtie \pi_{movid}(\sigma_{director='Bigelow' \wedge year \geq 2008 \wedge year \leq 2012}(M)))$

E9:  $\pi_{actid}(P \% \pi_{movid}(\sigma_{director='Bigelow' \wedge year \geq 2008 \wedge year \leq 2012}(M)))$

E10:  $\pi_{actid,movid}(P) \% \pi_{movid}(\sigma_{director='Bigelow' \wedge year \geq 2008 \wedge year \leq 2012}(M))$