Assignment 4: The Relational Algebra

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The requested queries

- 1. $\sigma_{\text{startdate}} < \text{enddate}(\text{event})$
- 2. $\pi_{\text{U.uid,E.eid}}(\rho_{\text{U}}(\text{user}) \bowtie_{\text{U.postcode}} = \text{E.postcode} \ \rho_{\text{E}}(\text{event}))$
- 3. $X := \rho_{\mathcal{E}}(\text{event}) \bowtie_{\mathcal{E}.\text{eid} = \mathcal{E}noRv.\text{eid}} \rho_{\mathcal{E}noRv}(\pi_{\text{eid}}(\text{event}) \setminus \pi_{\text{event}}(\text{review}))$ $\pi_{\mathcal{E}.\text{eid},\mathcal{E}.\text{title},\mathcal{E}.\text{description},\mathcal{E}.\text{startdate},\mathcal{E}.\text{enddate},\mathcal{E}.\text{organizer},\mathcal{E}.\text{postcode}(X)$
- 4. Select events with at least 3 keywords:

 $X := \rho_{K_1}(\text{keyword}) \times \rho_{K_2}(\text{keyword}) \times \rho_{K_3}(\text{keyword})$

 $Y := \sigma_{K_1.\text{word } \neq K_2.\text{ word } \wedge K_1.\text{word } \neq K_3.\text{ word } \wedge K_2.\text{word } \neq K_3.\text{ word } (X)$

$$Z := \sigma_{K_1.\text{event}} = K_2.\text{event } \wedge K_1.\text{event} = K_3.\text{event}} (Y)$$

Select events with at least 2 keywords:

 $A := \rho_{K_4}(\text{keyword}) \times \rho_{K_4}(\text{keyword})$

 $B := \sigma_{K_4.\text{word}} \neq K_5.\text{word}(A)$

$$C := \sigma_{K_4.\text{event } = K_5.\text{event}}(B)$$

Select events with exactly 3 keywords:

$$\pi_{K_4.event}(C) \setminus \pi_{K_1.event}(Z)$$

5. (a) $X := \rho_{R_1}(\text{review}) \times \rho_{R_2}(\text{review})$

Keep reviews from R_1 that are not from latest date:

$$Y := \sigma_{R_1.\text{reviewdate}} \langle R_2.\text{reviewdate} \wedge R_1.\text{user} = R_2.\text{user} (X)$$

Select user id and event id for which the user wrote a review most recently:

$$Z := \pi_{\text{user,event}}(\text{review}) \setminus \pi_{R_1.\text{user},R_1.\text{event}}(Y)$$

(b)
$$A := \rho_{R_1}(\text{review}) \times \rho_{R_2}(\text{review}) \times \rho_{E_1}(\text{event}) \times \rho_{E_2}(\text{event})$$

 $B := \sigma_{R_1.\text{user}} = R_2.\text{user} \wedge R_1.\text{event} = E_1.\text{eid} \wedge R_2.\text{event} = E_2.\text{eid} (A)$

Select reviews whose E_1 enddate are not from the latest:

$$C := \sigma_{E_1.\text{enddate} < E_2.\text{enddate}(B)}$$

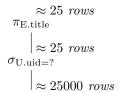
Select user id and event id of the most-recent event (according to enddate) for which the user wrote a review:

$$D := \pi_{R_1.\mathrm{user}, E_1.\mathrm{eid}}(B \setminus C)$$

(c) $\pi_{\text{LR.user,LR.lreview,LE.levent}}(\rho_{\text{LR(user,lreview})}(Z) \bowtie_{\text{LR.user}} = \text{LE.user} \rho_{\text{LE(user,levent)}}(D))$

Effiency of queries

7.



 $\sigma_{U.uid=R.user \land E.eid=R.event \land E.postcode=U.postcode}$

