



(1)

$PA \leftarrow Paper \bowtie Authoring$

$JU \leftarrow name = 'Jeffrey Ullman'$

$Result \leftarrow \pi_{\{title\}}(\sigma_{(JU)}(PA))$

(2)

$PA \leftarrow Paper \bowtie Authoring$

$Y \leftarrow year = '2011'$

$R \leftarrow \pi_{doi, name}(PA)$

$S \leftarrow \pi_{\{name\}}(\sigma_{(JU)} AND_{(Y)}(PA))$

$AllDoi \leftarrow R \div S$

$AllAuth \leftarrow AllDoi \bowtie Authoring$

$OtherA \leftarrow \pi_{\{name, doi\}}(AllAuth) - \pi_{\{name, doi\}} \sigma_{(JU)}(AllAuth)$

$Result \leftarrow \pi_{name, area}(OtherA \bowtie Researcher)$

(3)

$PA \leftarrow Paper \bowtie Authoring$

$Y \leftarrow year = '2011'$

$R \leftarrow \pi_{doi, name}(PA)$

$S \leftarrow \pi_{\{name\}}(\sigma_{(JU)}^{AND(Y)}(PA))$

$T_1 \leftarrow \pi_{doi}(R)$

$T_2 \leftarrow \pi_{doi}((S \times T_1) - R)$

$AllDoi \leftarrow T_1 - T_2$

$AllAuth \leftarrow AllDoi \bowtie Authoring$

$OtherA \leftarrow \pi_{\{name, doi\}}(AllAuth) - \pi_{\{name, doi\}}^{\sigma_{(JU)}}(AllAuth)$

$Result \leftarrow \pi_{name, area}(OtherA \bowtie Researcher)$