1 RELATIONAL ALGEBRA

- Relations are closed under relational algebra
- 1.1 Unary operators
- 1.1.1 Selection
 - $\sigma_c(E)$
- 1.1.2 Projection
 - $\pi A_1, A_2, \ldots, A_n(E)$
- 1.1.3 Rename
 - $\rho_{R(A_1,A_2,...,A_n)}(E)$
- 1.2 Set operators
- 1.2.1 Cross product
 - $E_1 \times E_2$
 - $|E_1 \times E_2| = |E_1| \times |E_2|$
- 1.2.2 Difference
 - $E_1 E_2$
- 1.2.3 Union
 - $E_1 \cup E_2$
 - $|E_1 \cup E_2| = |E_1| + |E_1 E_2|$
- 1.2.4 Intersection
 - $E_1 \cap E_2 = E_1 (E_1 E_2)$
- 1.3 Join operators
- 1.3.1 θ -join
 - $E_1 \bowtie_{\theta} E_2 = \sigma_{\theta}(E_1 \times E_2)$
- 1.3.2 Natural join
 - $E_1 \bowtie E_2 = \pi_{\ell_1}(E_1 \bowtie_c \rho_{\ell_2}(E_2))$

1.4 Alternate notations

1.4.1 Assignment statements

- $\bullet \ c := E$
- $\bullet\,$ Provides a way to modularize an expression

1.4.2 Expression trees

 $\bullet\,$ Similar to an AST