

Assignment 5

1. SELECT COUNT(*)

FROM invoices

WHERE InvoiceDate LIKE '2010-%';

$R_1 = \sigma_{\text{InvoiceDate LIKE '2010-\%'}}(\text{INVOICES})$

$R_2 = \gamma_{\text{COUNT}}(R_1)$

2. SELECT a.Title, COUNT(*) (2 rewritten @ end)

FROM tracks

INNER JOIN albums a ON tracks.AlbumId = a.AlbumId;

$R_1 = (\text{TRACKS}) \bowtie_{\text{tracks.AlbumId = a.AlbumId}} (\text{ALBUMS})$

$R_2 = \gamma_{\text{albums.Title } \gamma_{\text{COUNT}}} (R_1)$

3. SELECT BillingCity, AVG(Total)

FROM invoices

WHERE BillingCountry = 'Brazil'

GROUP BY BillingCity;

$R_1 = \sigma_{\text{BillingCountry = 'Brazil'}}(\text{INVOICES})$

$R_2 = \gamma_{\text{BillingCity } \gamma_{\text{AVG(Total)}}} (R_1)$

4. SELECT e.FirstName, COUNT(*)

FROM employees AS e

INNER JOIN customers c ON e.EmployeeId = c.SupportRepId

GROUP BY e.FirstName;

$R_1 = (\text{EMPLOYEES}) \bowtie_{\text{e.EmployeeId = c.SupportRepId}} (\text{CUSTOMERS})$

$R_2 = \gamma_{\text{e.FirstName } \gamma_{\text{COUNT}}} (R_1)$

2. SELECT a.Title, COUNT(*)

FROM tracks

INNER JOIN albums a ON tracks.AlbumId = a.AlbumId

GROUP BY a.Title

HAVING COUNT(*) > 20;

$R_1 = (\text{tracks}) \bowtie_{\text{AlbumId} = \text{AlbumId}} (\text{albums})$

$R_2 = \pi_{\text{Title}, \text{COUNT}(*)}(R_1)$

$R_3 = \sigma_{\text{COUNT}(*)>20}(R_2)$