

Problem 1

Give the corresponding relational algebra for the following queries with the provided schema (underlined attributes are the unique key of the relations):

organizations(name, alignment)

The names and alignments (good or evil) for each organization.

suppliers(buyer_name, supplier_name, supplies, profit)

Buyers, suppliers, what the supplier gives to the buyer, and the profit made by the supplier.

people(name, address, blood_type)

People, all employees of some company, with their address and blood types.

salaries(organization_name, employee_name, salary)

Payroll of all organizations, with employee names and salaries.

crimes(perpetrator, target, loss, reward, jailtime)

Perpetrator committed a crime against target, the loss is the monetary loss to the target. Reward is the reward for the capture of the perpetrator and jailtime is the sentence the perpetrator would have to serve.

1. Get the names of all double agents: people who work for both evil corporations and good corporations
2. Get the names of all people who work for the same corporation and live at the same address
3. Get the names of all suppliers who do not supply evilcorp
4. Get the names of suppliers who make more than 3 million dollars without servicing neither evilcorp nor MI6
5. Get all crimes with a reward more than the entire payroll of Huge Manatee Corporation
6. Get all organizations spending more than 2 million dollars on their payroll
7. Get all employees of evilcorp who have the same blood type as Dr. Evil (just in case)
8. Get the cumulative reward for the capture of "Eva Luatore" for all her crimes
9. Get all crimes where the perpetrator works for the target company

Problem 2

id	name	location	clothing color	cloth material
4	Oddjob	Indochina	Blue	Cotton
5	Oddjob	Las Vegas	Pink	Cotton Tutu
6	Jaws	Indochina	Yellow	Muslin
11	Jaws	India	Red	Cashmere
11	Jaws	Las Vegas	Red	Silk
11	Jaws	Africa	Red	Silk
12	Dr No	Jordan	Green	Hemp
13	Dr No	Octopus' Garden	Brown	Hemp
16	Octopussy	India	Red	Cotton
17	Octopussy	Las Vegas	Blue	Silk
18	Octopussy	Africa	Red	Grass
19	Octopussy	Octopus' Garden	Black	Leather
20	Saurya	India	Red	Leather
21	Saurya	Indochina	Red	Silk
22	Number One	Las Vegas	Pink	Neglige
23	Saurya	Las Vegas	Pink	Tutu
24	Saurya	Africa	Red	Halter
25	Number One	Africa	Red	Neglige

location	clothing color
India	Red
Las Vegas	Pink
Africa	Red

James Bond has some leads to track down some henchmen on a world tour by their trail of bodies. There was fabric found at the crime scenes that did not belong to the victims, and James plans to use that to figure who the murderer was. James has kept terrific accounting of the clothing each henchman wore in a particular location.

Perform relational algebra division of tables T1 and T2 using only elementary relational algebra (cartesian product, subtraction, projection, rename) to find the crooks involved.