

COMP518 Assignment 1

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1. Question one

- 1) Find the lectures who teach at least one course. Show the lid's of those lectures?

$$\Pi_{lid}(course)$$

- 2) Find the students who have the same name as some lecturers. Show the IDs and names of the students?

$$\Pi_{sid,name} \left(\sigma_{student.name=lecturer.name} (\Pi_{sid,name} student \times \Pi_{name} lecturer) \right)$$

- 3) Find the students who do not enroll in any course taught by 'John Smith'. Show the names of those students?

$$\Pi_{name} \left(student - \left(student \bowtie \Pi_{sid} (enrolment \bowtie course \bowtie \sigma_{name='john smith'}(lecturer)) \right) \right)$$

- 4) Find the courses for which there are not both students with name 'John' or 'Alice' who enroll in. That is, that in any course appeared in the outcome, there may be a student with name 'John' or a student with name 'Alice', but there should not be both. Show the cids of those courses.

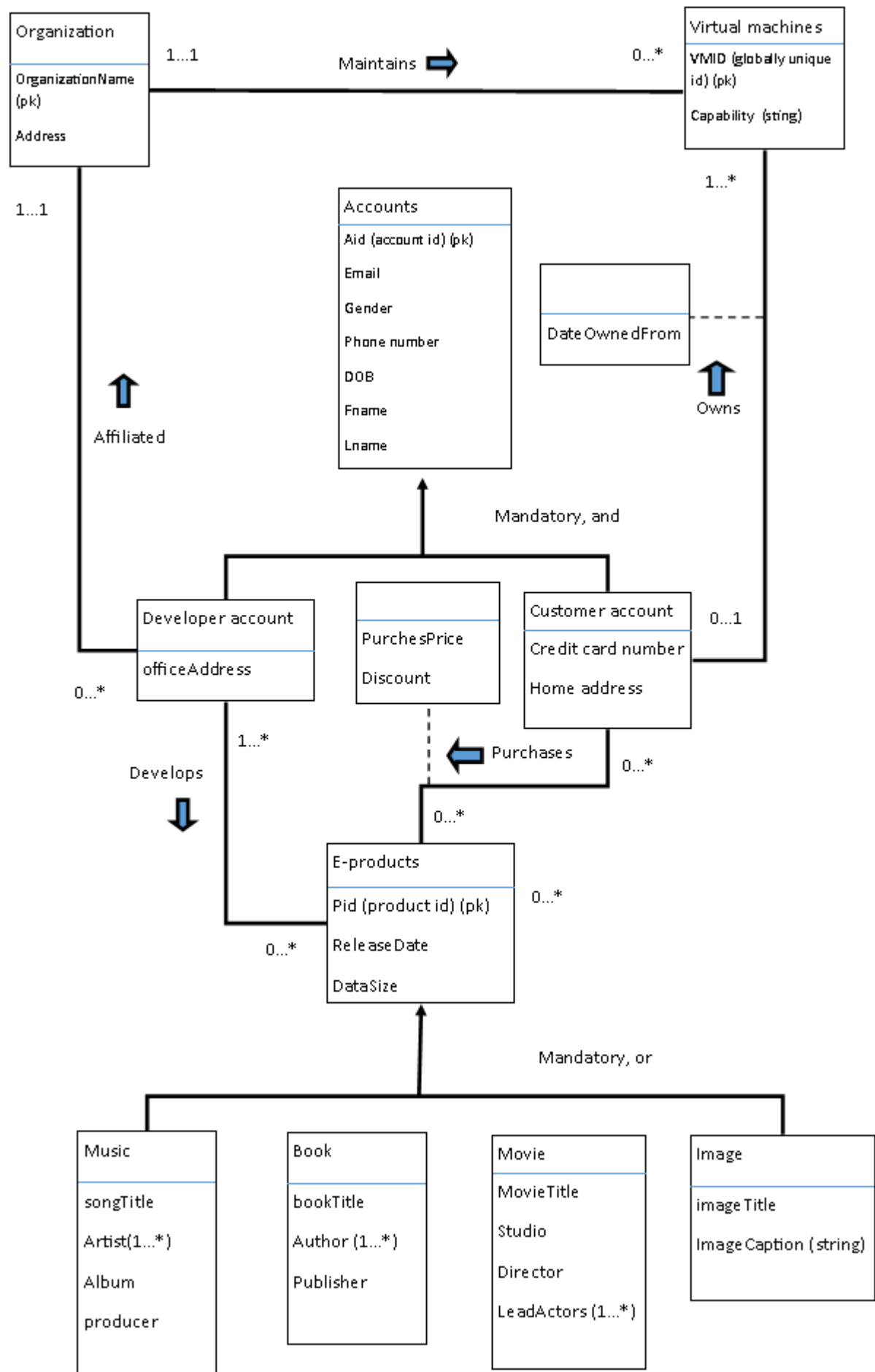
$$\Pi_{cid}(enrolment) - \left(\Pi_{cid} (enrolment \bowtie \sigma_{name='john'}(student)) \cap \Pi_{cid} (enrolment \bowtie \sigma_{name='Alice'}(student)) \right)$$

- 5) Find the students who have the same name as some other student. Show the names of the students.

$$\Pi_{student.name} \left(\sigma_{student.name=s.name} (student \times \rho(s, student)) - \sigma_{student.sid=s.sid} (student \times \rho(s, student)) \right)$$

- 6) Find the students who take all the courses taught by 'David Cheung'. Show how only the IDs of these students.

$$\Pi_{sid} \left(Enrolment \div \Pi_{cid} (Course \bowtie \sigma_{name='David Cheung'}(Lecturer)) \right)$$



Above is my EER diagram for the database written about in the task

Here is a list of assumptions I have while making my EER diagram:

- I have not included a runs connection between virtual machines and e-product as I believe the customer uses their virtual machine to then run what they have purchased so it goes through the customer account.
- The types of E-product are mandatory, or. Each one can only have one of the values, I have included attributes that I believe would be used but more could easily be added.
- Organizations will own e-products, but we are showing this through developer account.
- One developer can make multiple e-products and my interpretation is that each product is made by at least one developer which can be more than one.
- Account has to be at minimum customer or developer but one account could have be both developer and customer.
- The database holds information on purchesPrice and discount when a purchase occurs
- It also holds information on the dateOwnedFrom for a customer account owning a virtual machine.
- Organizations can be affiliated to 0...* developers as they could run virtual machines without developing their own e-products. This means they could have no developers.
- Equally a organization could have a lot of developers developing e-products but maintain no virtual machines.