

Introduction to Databases- TUTORIAL 1 - SF25018Problem 1

- (1) Return the (value of attribute) Number of all accounts by customers called "John Doe"

```
SELECT Number
FROM Account
WHERE ID = CustID AND Name = 'John Doe'
```

- (2) Return the Number and Branch of all accounts owned by a customer with ID "xyz 123" only if there is such a customer in the Customer table.

```
SELECT Number, Branch
FROM Account
WHERE CustID = ID AND ID = 'xyz 123'
```

- (3) Return the Number and Balance of all over-drawn accounts in the "London" branch

```
SELECT Number, Balance
FROM Account
WHERE Balance < 0 AND Branch = 'London'
```

- (4) Return all the pairs (Name, Number), such that the branch of the account is in a different city from where the owner lives

```
SELECT Name, Number
FROM Customer, Account
WHERE ID = CustID AND Branch <> City
```

Problem 2

- (1) ID and name of customers who own an account in a branch in their city

~~$$\pi_{ID, name, ID} (\sigma_{ID=ID} (Customer \times Account))$$~~

~~$$\pi_{BRANCH=city} (Customer \times Account)$$~~

~~$$\pi_{ID=ID} (Customer \times Account)$$~~

$$\pi_{name, ID} (\sigma_{ID=ID \text{ AND } BRANCH=city} (Customer \times Account))$$

- (2) "ID and name of customer who do not own any account"

$$Customer - \pi_{ID, name, city} (\sigma_{ID=ID} (Customer \times Account))$$

- (3) "ID and name of customer who own an account in every branch

$$A = \pi_{ID, name, BRANCH} (\sigma_{ID=ID} (Customer \times Account))$$

~~$$B = \pi_{BRANCH} (Account)$$~~

$$A \div B = \pi_z (A) - \pi_z (\pi_z (A) \times B - A)$$

$$\text{where } z = A - B$$

(4) "ID and name of customer who own an account with a balance which is no less than the balance of any other account"

$\pi_{ID, name} \left(\sigma_{ID=MAXID \text{ AND } BALANCE \geq 0} (Customer \times Account) \right)$

Problem 3

~~No this is because (4) of problem 2 is the account with the ^{greatest} smallest balance and so as a result~~

YES:

Customer			Account			
ID	NAME	CITY	Number	Branch	CusID	B.
0	'A'	Edin	0	London	0	1
1	'B'	Edin	1	Edin	1	10
2	'C'	Edin	2	Edin	2	10

query would return:

ID	NAME
1	'B'
2	'C'

 since balance of 'B' = 'C'.

Problem 4

Customer				Account	
Customer ID	City	ID	City	ID	
1	L	1	L	1	
2	E	1	E	1	
3	L	3	L	3	
4	C.	2	L	2	

Customer X1 $\left(\begin{array}{cc} CITY & ID \\ L & 1 \\ L & 3 \end{array} \right) =$

ID	CITY	NAME
1	L	John
3	L	Jeff

= 122