

Mentorium 6
Business Informatics 2 (PWIN)

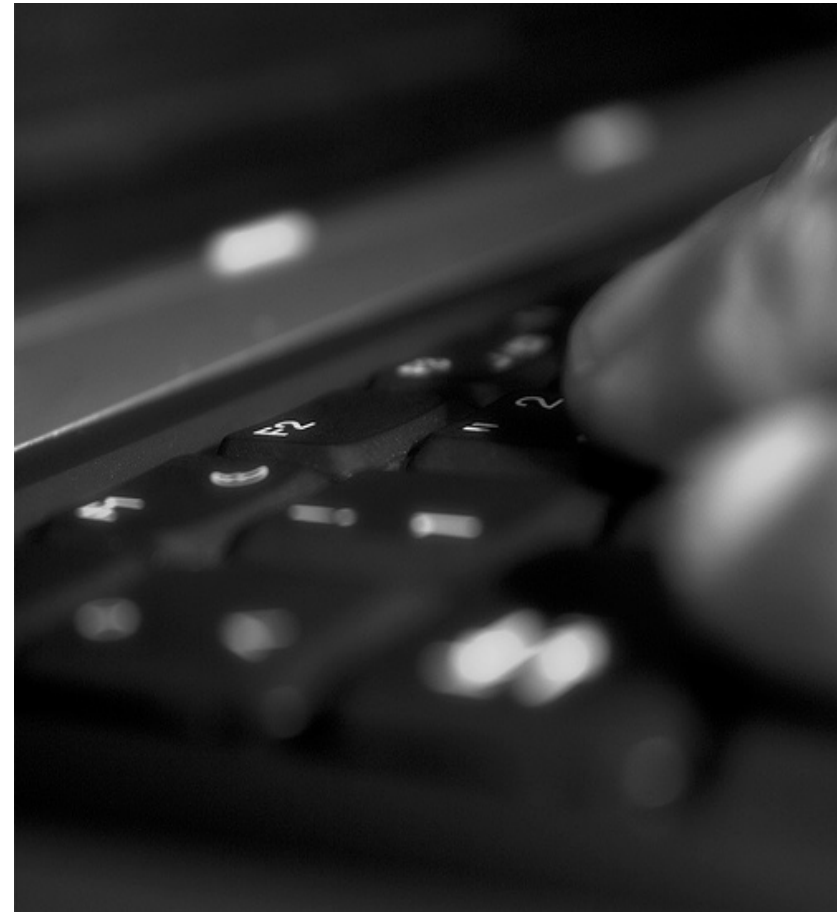
SQL

Business Process
Reengineering

Open Questions

WS 2011/2012

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Jenser (Flickr.com)

- Structure of the basic elements
 - SELECT attribute(s)
 - FROM relation(s)
 - [WHERE condition(s)]
 - [GROUP BY attribute(s)]
 - [ORDER BY attribute(s)]
- Date Format, Strings and Numbers
 - Date Format: 'YYYY-MM-DD', e.g. '1974-12-31'
 - Strings: 'String', e.g. 'I like SQL'
 - Numbers: Number, e.g. 41 or 34.12

Note: (1) Dates and Strings have to be enclosed by two apostrophes.
(2) The conditions in [...] are optional.

SELECT * ← *All columns*
FROM Products ← *table „Products“*
ORDER BY ID ← *order result by column „ID“*

ID	Product_name	Colour	Article_no	Sale_price	Purchase_price	Stock	Items_sold	City
1	Monitor 17"	White	1297812542	399.00	249.99	50	134	Frankfurt
2	Monitor 19"	black	2457897145	499.00	379.00	12	289	Berlin
3	Monitor 17"	black	1297467815	405.00	249.99	25	124	Frankfurt
4	Monitor 19"	white	2459871327	509.00	389.99	150	12	Frankfurt
5	Monitor 20"	black	2789441512	799.00	599.00	520	1052	Berlin
6	Monitor 20"	white	2799151424	829.00	549.99	100	26	Berlin
7	Monitor 20"	anthracite	2764657527	819.00	589.99	50	127	Nürnberg
8	Monitor 21"	anthracite	2845161215	999.00	799.99	100	279	Hamburg
9	Monitor 24"	white	2945712415	1299.00	945.00	25	124	Berlin
10	Monitor 24"	black	2955745742	1350.00	956.00	450	1024	Hamburg
...								

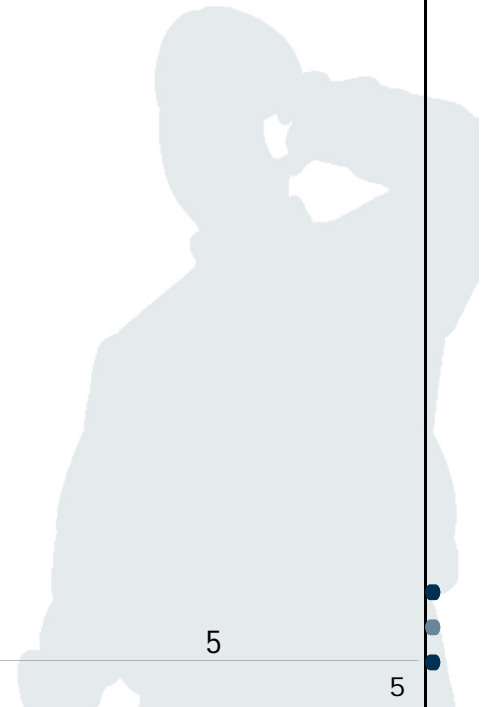
DML: SELECT using WHERE

SELECT *
FROM Products
WHERE Purchase_price > 500 AND City = "Berlin"

ID	Product_name	Colour	Article_no	Sale_price	Purchase_price	Stock	Sold_items	City
5	Monitor 20"	black	2789441512	799.00	599.00	520	1052	Berlin
6	Monitor 20"	white	2799151424	829.00	549.99	100	26	Berlin
9	Monitor 24"	white	2945712415	1299.00	945.00	25	124	Berlin

```
SELECT ID, City, Stock  
FROM Products  
ORDER BY ID
```

<u>ID</u>	City	Stock
1	Frankfurt	50
2	Berlin	12
3	Frankfurt	25
4	Frankfurt	150
5	Berlin	520
6	Berlin	100
7	Nürnberg	50
8	Hamburg	100
9	Berlin	25
10	Hamburg	450
...



SELECT using SUM and GROUP BY

```
SELECT      City, SUM(Stock)
FROM        Products
GROUP BY    City
```

City	SUM(Stock)
Frankfurt	225
Berlin	657
Nürnberg	50
Hamburg	550
...	

- Further Aggregate Functions
 - AVG(x) returns the average value of x
 - SUM(x) returns the sum of x
 - MIN(x) returns the minimum value of x
 - MAX(x) returns the maximum value of x
 - COUNT(x) returns the number of values for x
 - STDDEV(x) returns the standard deviation of x.
- x denotes an array of values (e.g. as the result of a SELECT query).

INSERT INTO

Product_Info (Article_no, Weight,
Resolution, Power_consumption)
VALUES

(2689875627,6,"1280x1024",55)

Table "Product_Info"

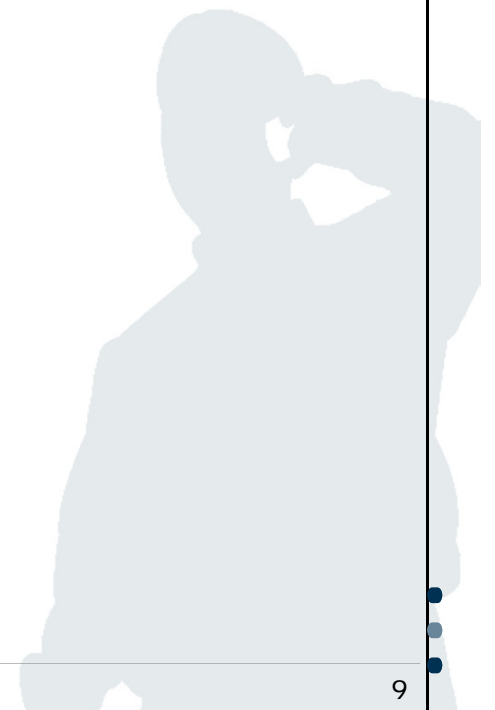
ID	Article_no	Weight	Resolution	Power_consumption
1	1297812542	4	1280X1024	26
2	2457897145	5	1280X1024	29
3	1297467815	4	1280X1024	27
4	2459871327	5.5	1280X1024	34
5	2789441512	8	1600x1280	53
6	2689875627	6	1280X1024	55
..				

Note: The "ID" column is a primary key and is automatically inserted with the new record.

- SQL

- Business Process Reengineering

- Open Questions



Database: Fortune Bank

Table: branch

branch_name	branch_city	assets
Brighton	Brooklyn	7100000.00
Downtown	Brooklyn	9000000.00
Mianus	Horseneck	400000.00
North Town	Rye	3700000.00
Perryridge	Horseneck	1700000.00
Pownal	Bennington	300000.00
Redwood	Palo Alto	2100000.00
Round Hill	Horseneck	8000000.00

Table: customer

customer_name	customer_street	customer_city
Adams	Spring	Pittsfield
Brooks	Senator	Brooklyn
Curry	North	Rye
Glenn	Sand Hill	Woodside
Green	Walnut	Stamford
Hayes	Main	Harrison
Jackson	University	Salt Lake
Johnson	Alma	Palo Alto
Jones	Main	Harrison
Lindsay	Park	Pittsfield
Smith	Main	Rye
Turner	Putnam	Stamford
Williams	Nassau	Princeton

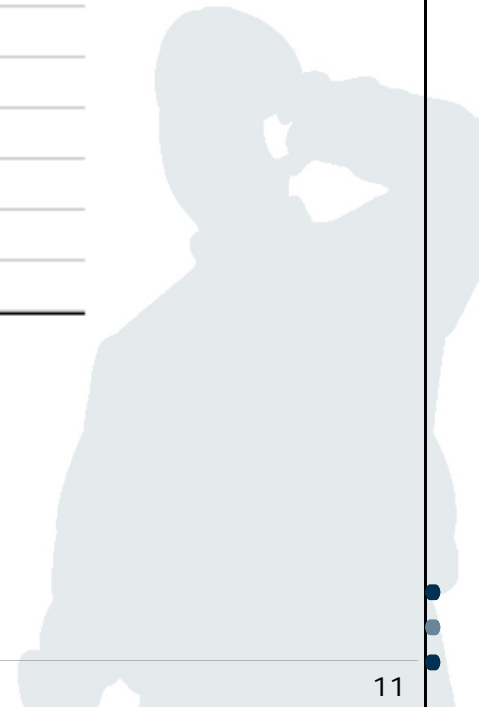
Database: Fortune Bank

Table: loan

loan_number	branch_name	amount
L-11	Round Hill	900.00
L-14	Downtown	1500.00
L-15	Perryridge	1500.00
L-16	Perryridge	1300.00
L-17	Downtown	1000.00
L-23	Redwood	2000.00
L-93	Mianus	500.00

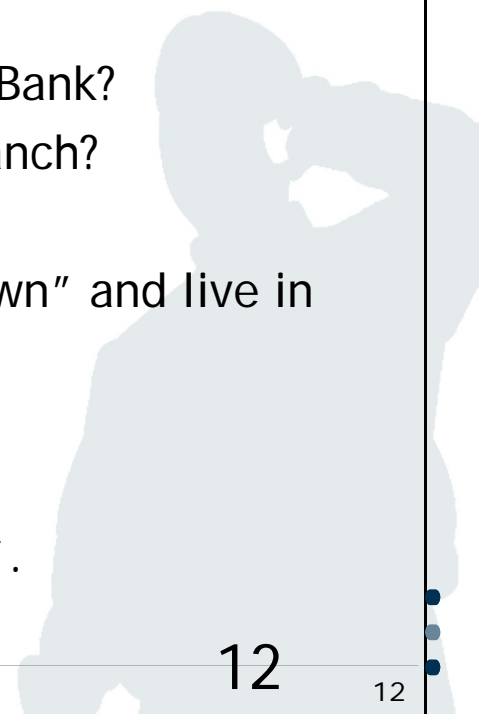
Table: borrower

customer_name	loan_number
Adams	L-16
Curry	L-93
Hayes	L-15
Jackson	L-14
Jones	L-17
Smith	L-11
Smith	L-23
Williams	L-17



Write the appropriate SQL statements to answer the following questions and draw table which will be returned as a result.

- a) What is the average amount of loans over all branches?
- b) What is the total amount of loans granted by the Fortune Bank?
- c) What is the amount of loans granted by the Downtown branch?
- d) How many branches does the Fortune Bank have?
- e) How many borrowers are serviced by the branch "Downtown" and live in Princeton?
- f) How many loans were granted over 1000\$?
- g) Insert a new loan in the table "loan".
- h) Delete the previously inserted entry from the table "loan".



a) What is the average amount of loans over all branches?

```
SELECT avg(amount)  
FROM loan
```

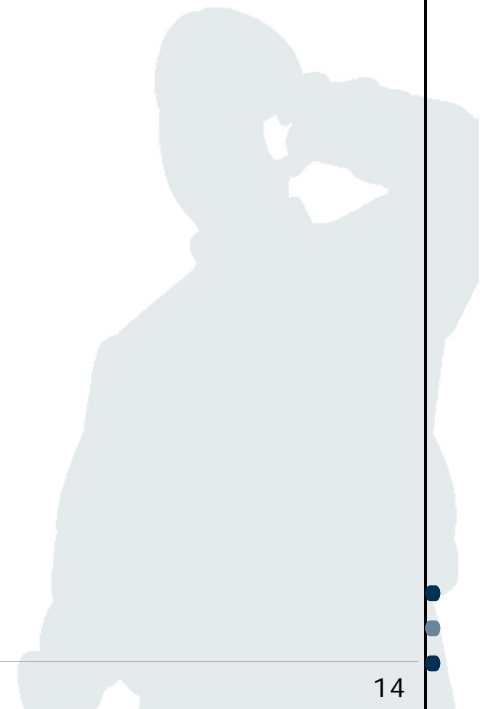
1242.857142



b) What is the total amount of loans granted by the Fortune Bank?

```
SELECT sum(amount)
FROM loan
```

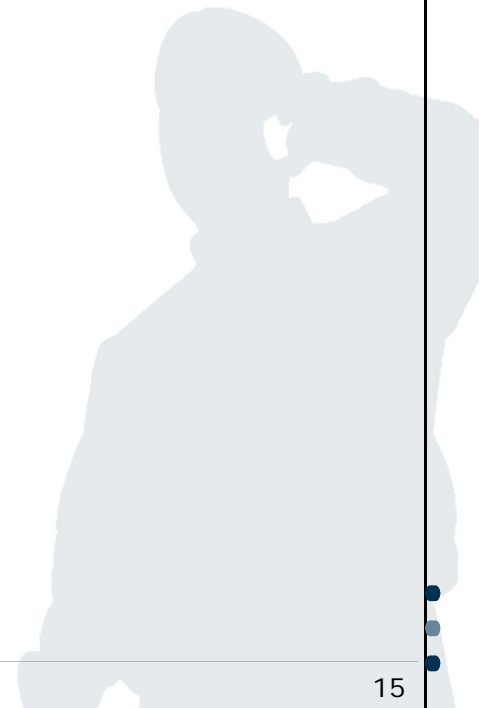
8700.00



c) What is the amount of loans granted by the Downtown branch?

```
SELECT sum(amount), branch_name  
FROM loan  
WHERE branch_name = "Downtown"  
GROUP BY branch_name
```

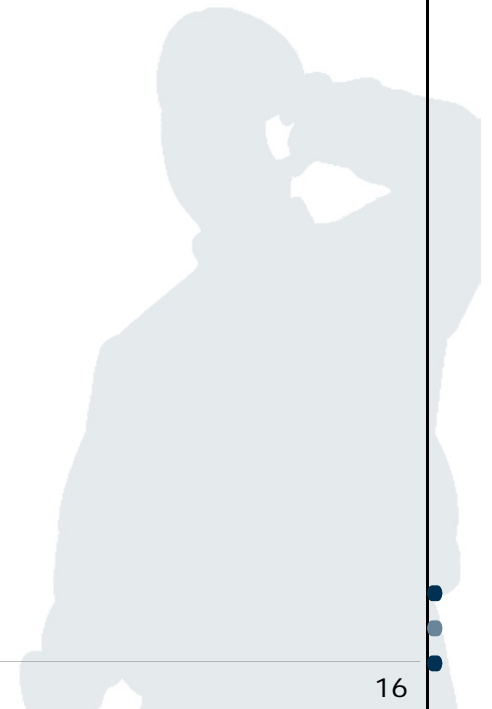
	branch_name
2500.00	Downtown



d) How many branches does the Fortune Bank have?

```
SELECT count(branch_name)  
FROM branch
```

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e) How many borrowers are serviced by the branch “Downtown” and live in Princeton?

loan_number	branch_name	amount
L-11	Round Hill	900.00
L-14	Downtown	1500.00
L-15	Perryridge	1500.00
L-16	Perryridge	1300.00
L-17	Downtown	1000.00
L-23	Redwood	2000.00
L-93	Mianus	500.00

Table: loan

Table: customer

customer_name	customer_street	customer_city
Adams	Spring	Pittsfield
Brooks	Senator	Brooklyn
Curry	North	Rye
Glenn	Sand Hill	Woodside
Green	Walnut	Stamford
Hayes	Main	Harrison
Jackson	University	Salt Lake
Johnson	Alma	Palo Alto
Jones	Main	Harrison
Lindsay	Park	Pittsfield
Smith	Main	Rye
Turner	Putnam	Stamford
Williams	Nassau	Princeton

Table: borrower

customer_name	loan_number
Adams	L-16
Curry	L-93
Hayes	L-15
Jackson	L-14
Jones	L-17
Smith	L-11
Smith	L-23
Williams	L-17

How many borrowers are serviced by the branch "Downtown" and live in Princeton?

Table: loan

loan_number	branch_name	amount
L-11	Round Hill	900.00
L-14	Downtown	1500.00
L-15	Perryridge	1500.00
L-16	Perryridge	1300.00
L-17	Downtown	1000.00
L-23	Redwood	2000.00
L-93	Mianus	500.00

Table: borrower

customer_name	loan_number
Adams	L-16
Curry	L-93
Hayes	L-15
Jackson	L-14
Jones	L-17
Smith	L-11
Smith	L-23
Williams	L-17

+

=

loan_number	branch_name	amount	customer_name	loan_number
L-16	Perryridge	1300.00	Adams	L-16
L-93	Mianus	500.00	Curry	L-93
L-15	Perryridge	1500.00	Hayes	L-15
L-14	Downtown	1500.00	Jackson	L-14
L-17	Downtown	1000.00	Jones	L-17
L-11	Round Hill	900.00	Smith	L-11
L-23	Redwood	2000.00	Smith	L-23
L-17	Downtown	1000.00	Williams	L-17

loan INNER JOIN borrower ON loan.loan_number=borrower.loan_number

How many borrowers are serviced by the branch "Downtown" and live in Princeton?

loan_number	branch_name	amount	customer_name	loan_number
L-16	Perryridge	1300.00	Adams	L-16
L-93	Mianus	500.00	Curry	L-93
L-15	Perryridge	1500.00	Hayes	L-15
L-14	Downtown	1500.00	Jackson	L-14
L-17	Downtown	1000.00	Jones	L-17
L-11	Round Hill	900.00	Smith	L-11
L-23	Redwood	2000.00	Smith	L-23
L-17	Downtown	1000.00	Williams	L-17

+

customer_name	customer_street	customer_city
Adams	Spring	Pittsfield
Brooks	Senator	Brooklyn
Curry	North	Rye
Glenn	Sand Hill	Woodside
Green	Walnut	Stamford
Hayes	Main	Harrison
Jackson	University	Salt Lake
Johnson	Alma	Palo Alto
Jones	Main	Harrison
Lindsay	Park	Pittsfield
Smith	Main	Rye
Turner	Putnam	Stamford
Williams	Nassau	Princeton

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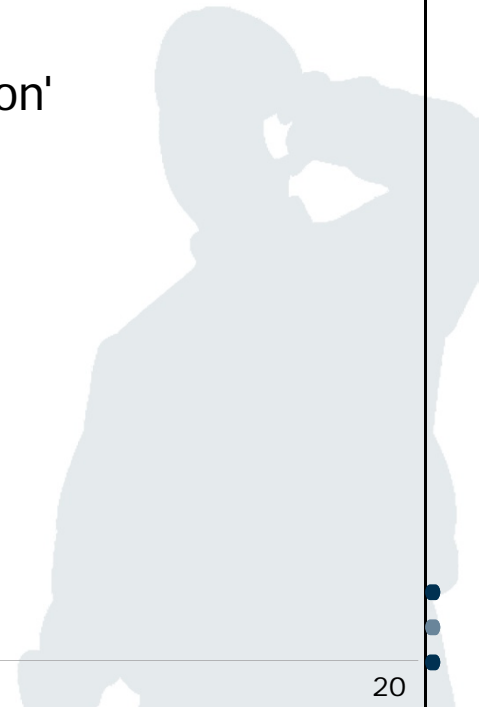
loan_number	branch_name	amount	customer_name	loan_number	customer_name	customer_street	customer_city
L-16	Perryridge	1300.00	Adams	L-16	Adams	Spring	Pittsfield
L-93	Mianus	500.00	Curry	L-93	Curry	North	Rye
L-15	Perryridge	1500.00	Hayes	L-15	Hayes	Main	Harrison
L-14	Downtown	1500.00	Jackson	L-14	Jackson	University	Salt Lake
L-17	Downtown	1000.00	Jones	L-17	Jones	Main	Harrison
L-11	Round Hill	900.00	Smith	L-11	Smith	Main	Rye
L-23	Redwood	2000.00	Smith	L-23	Smith	Main	Rye
L-17	Downtown	1000.00	Williams	L-17	Williams	Nassau	Princeton

(loan INNER JOIN borrower ON loan.loan_number=borrower.loan_number) INNER JOIN customer ON borrower.customer_name = customer.customer_name

e) How many borrowers are serviced by the branch “Downtown” and live in Princeton?

```
SELECT COUNT(customer.customer_name)
FROM (loan INNER JOIN borrower ON
      loan.loan_number=borrower.loan_number) INNER JOIN customer ON
      borrower.customer_name = customer.customer_name
WHERE branch_name='Downtown' and customer_city='Princeton'
```

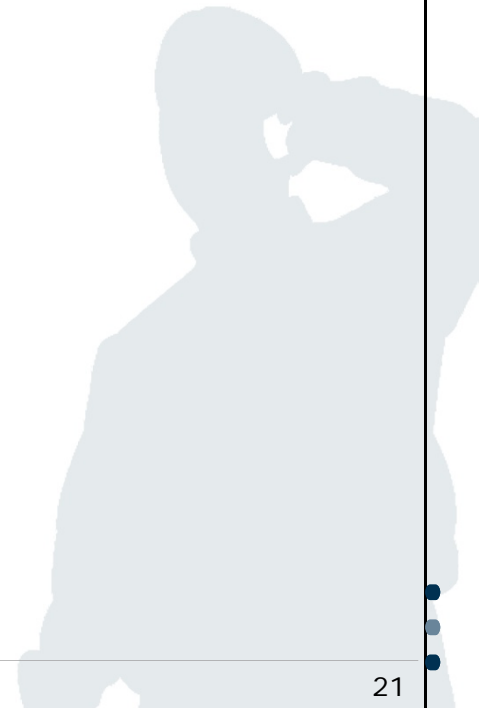
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f) How many loans were granted exceeding \$1000 ?

```
SELECT COUNT(loan_number)
FROM loan
WHERE amount>1000
```

4



g) Insert a new loan in the table "loan".

```
INSERT INTO loan (loan_number, branch_name, amount)
VALUES („L-94“, „Downtown“, 4000)
```

loan_number	branch_name	amount
L-11	Round Hill	900.00
L-14	Downtown	1500.00
L-15	Perryridge	1500.00
L-16	Perryridge	1300.00
L-17	Downtown	1000.00
L-23	Redwood	2000.00
L-93	Mianus	500.00



loan_number	branch_name	amount
L-11	Round Hill	900.00
L-14	Downtown	1500.00
L-15	Perryridge	1500.00
L-16	Perryridge	1300.00
L-17	Downtown	1000.00
L-23	Redwood	2000.00
L-93	Mianus	500.00
L-94	Downtown	4000.00

h) Delete the previously inserted entry from the table “loan”.

```
DELETE FROM loan  
WHERE loan_number= 'L-94 '
```

loan_number	branch_name	amount
L-11	Round Hill	900.00
L-14	Downtown	1500.00
L-15	Perryridge	1500.00
L-16	Perryridge	1300.00
L-17	Downtown	1000.00
L-23	Redwood	2000.00
L-93	Mianus	500.00
L-94	Downtown	4000.00

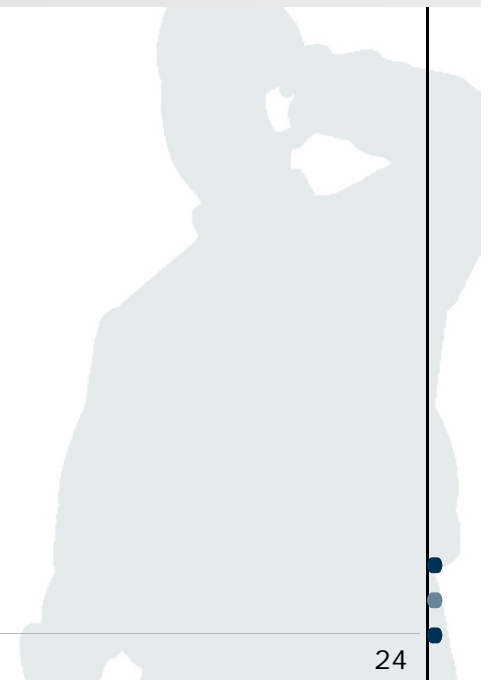


loan_number	branch_name	amount
L-11	Round Hill	900.00
L-14	Downtown	1500.00
L-15	Perryridge	1500.00
L-16	Perryridge	1300.00
L-17	Downtown	1000.00
L-23	Redwood	2000.00
L-93	Mianus	500.00

- SQL

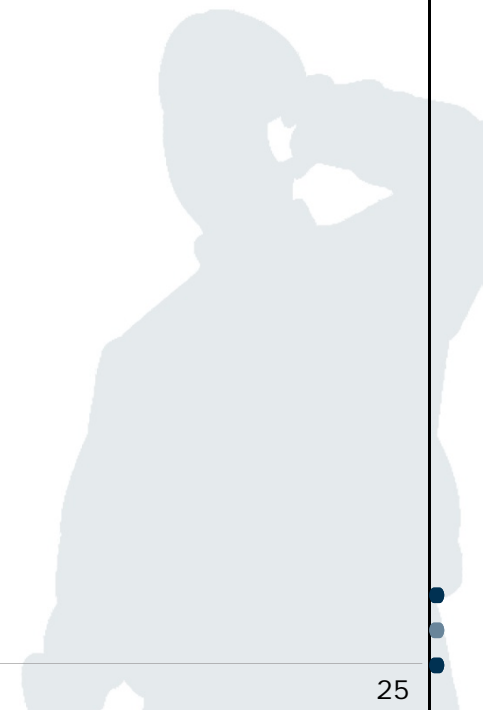
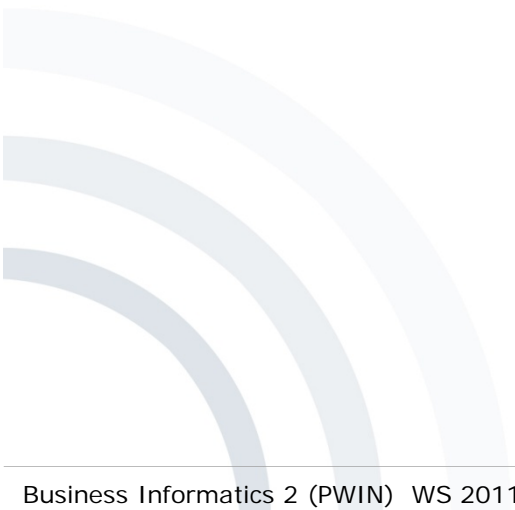
- Business Process Reengineering

- Open Questions



What are the bottlenecks for implementing Business Process Reengineering in a company?

Do these bottlenecks also apply for Process Optimisation approaches?



- SQL
- Business Process Reengineering
- Open Questions



Open Questions?

