

A9: Main accesses to the database and transactions

This artefact shows the main accesses to the database, including the transactions.

For each transaction, the isolation level is explicitly stated and read-only transactions are identified to improve global performance. For each identified access, the SQL code and the reference of web resources (A7) are provided.

1. Main Accesses

Main accesses to the database.

M01: Authentication and Profile

SQL101 Login a user.

Web Resource [R102](#)

```
SELECT id
FROM users
WHERE email = $email AND password = $hashedPassword;
```

M02: Products and Categories

SQL201 Get products from a category.

Web Resource [R202](#)

```
SELECT id
FROM categories
WHERE name = $categoryName;

SELECT products.id,products.name,products.price
FROM products
WHERE category_id = $categoryId AND products.id
NOT IN(SELECT * FROM archived_products);

SELECT path
FROM photos
WHERE product_id = $prod_id;
```

M03: Management Area

SQL301 Update purchases state.

Web Resource [R302](#)

```
UPDATE purchases
SET status = $status
WHERE purchase_id = $purchaseId
```

M04: Product and Reviews

SQL401 Retrieve a products information.

Web Resource [R401](#)

```
SELECT name, price, score, brand, quantity
FROM products
WHERE id = $prod_id;
```

M05: Static Pages

SQL501 Retrieve all frequently asked questions.

Web Resource [R501](#)

```
SELECT *
FROM faqs;
```

2. Transactions

Transactions needed to assure the integrity of the data, with a proper justification.

T01 Retrieve a product, its information, properties and reviews.

Isolation level	SERIALIZABLE READ ONLY
-----------------	------------------------

Justification	In the middle of the transaction, the insertion of new rows in the review can occur, which implies that the information retrieved in the query that selects the reviews counter and the query that selects the reviews is different, consequently resulting in a Phantom Read. It's READ ONLY because it only uses Selects.
---------------	---

```
BEGIN TRANSACTION;
SET TRANSACTION ISOLATION LEVEL SERIALIZABLE READ ONLY

SELECT COUNT(*)
FROM reviews AS R
WHERE R.product_id = $prod_id;
```

```

SELECT R.title, R.content, R.date, R.score, U.name
FROM reviews AS R
WHERE R.product_id = $prod_id;

COMMIT;

```

T02 Complete a new purchase

Isolation level	REPEATABLE READ
-----------------	-----------------

Justification In order to maintain consistency, it's necessary to use a transaction to ensure that the all the code executes without errors. If an error occurs, a ROLLBACK is issued (when the insertion of a product_purchase fails, per example). The isolation level is Repeatable Read, because, otherwise, an update of product.quantity could happen, due to an update in the table products committed by a concurrent transaction, and as a result, there could be not enough product quantity.

```

BEGIN TRANSACTION;
SET TRANSACTION ISOLATION LEVEL REPEATABLE READ

INSERT INTO purchases (total,user_id,address_id) VALUES
($total,$userid,$address_id)

INSERT INTO product_purchases (product_id,purchase_id,quantity,price)
VALUES ($proId,$purchId,$quantity,$price)

COMMIT;

```

GROUP1761, 25/04/2018

- Bárbara Sofia Lopez de Carvalho Ferreira da Silva, up201505628@fe.up.pt
- Carlos Miguel da Silva de Freitas, up201504749@fe.up.pt
- Julieta Pintado Jorge Frade, up201506530@fe.up.pt
- Luís Noites Martins, up201503344@fe.up.pt