

## Task 2 (3 marks)

**An objective of this task is to write implementation of the queries as the relational algebra expressions**

Consider the following queries related to the relational tables included in tpchr sample database.

- (1) Find the names of parts (P\_NAME) shipped by a supplier Golden Bolts (S\_NAME).
- (2) Find the names of parts together with the names of suppliers. If a supplier has the same name as a name of part then list such name only one time.
- (3) Find the names of parts (P\_NAME) not shipped by any supplier.

Write the implementations of the queries listed above as expressions of the relational algebra and as SELECT statements.

Save the relational algebra expressions implanting the queries listed above in a file solution2.pdf.

## Deliverables

A file solution2.pdf that contains implementation of the queries listed above as the expressions of the relational algebra. The handwritten and scanned/photographed implementations of the queries are acceptable.

## Solutions

- (1) Find the names of parts (P\_NAME) shipped by a supplier Golden Bolts (S\_NAME).

$$\pi_{p\_name} (\sigma_{s\_name = 'golden bolts'} ((PART \bowtie_{p\_partkey = ps\_partkey} PARTSUPP) \bowtie_{s\_suppkey = ps\_suppkey} SUPPLIER))$$

```
SELECT p_name
FROM PART JOIN PARTSUPP
        ON p_partkey = ps_partkey
        JOIN SUPPLIER
        ON s_suppkey = ps_SUPPKEY
WHERE SUPPLIER.s_name = 'Golden Bolts';
```

- (2) Find the names of parts together with the names of suppliers. If a supplier has the same name as a name of part then list such name only one time.

$$\pi_{p\_name} (PART) \cup \pi_{s\_name} (SUPPLIER)$$

```
SELECT p_name
FROM PART
UNION
SELECT s_name
FROM PART;
```

(3) Find the names of parts (P\_NAME) not shipped by any supplier.

$\pi_{p\_name} (PART \sim_{p\_partkey = ps\_partkey} PARTSUPP)$

```
SELECT p_name
FROM PART
WHERE PART.p_partkey NOT IN (SELECT ps_partkey
                             FROM PARTSUPP);
```

---

*End of sample solution*