**Experiment 3.3**

**Student Name:   Gaurav Kumar                                UID: 22MCC20177**

**Branch:   CC-DevOps                                                        Section/Group: 1/B**

**Semester:   I                                                               Date of Performance: 01/01/2023**

**Subject Name: ADBMS                     Subject Code: 22CAP-647**

1. **Task to be done:**

**Consider the following query on our Engineering database:**

**SELECT ENAME, SAL FROM EMP, PROJ, ASG, PAY**

**WHERE EMP.ENO = ASG.ENO AND EMP.TITLE = PAY.TITLE**

**AND (BUDGET>200000 OR DUR>24) AND ASG.PNO = PROJ.PNO**

**AND (DUR > 24 OR PNAME = "CAD/CAM")**

**Compose the selection predicate corresponding to the WHERE clause and transform it, using the idempotency rules, into the simplest equivalent form. Furthermore, compose an operator tree corresponding to the query and transform it, using relational algebra transformation rules, to three equivalent forms.**

**Answer :**

The selection predicate for the WHERE clause is:

(EMP.ENO = ASG.ENO AND EMP.TITLE = PAY.TITLE AND (BUDGET>200000 OR DUR>24) AND ASG.PNO = PROJ.PNO AND (DUR>24 OR PNAME = "CAD/CAM"))

Using the idempotency rules, we can simplify this to:

((BUDGET>200000 OR DUR>24) AND (DUR>24 OR PNAME = "CAD/CAM"))

The operator tree corresponding to the query is:

SELECT (ENAME,SAL)

FROM (EMP, PROJ, ASG, PAY)

WHERE (EMP.ENO = ASG.ENO AND EMP.TITLE = PAY.TITLE

AND (BUDGET>200000 OR DUR>24) AND ASG.PNO = PROJ.PNO

AND (DUR>24 OR PNAME = "CAD/CAM"))

Using relational algebra transformation rules, we can rewrite this operator tree in three equivalent forms:

1. SELECT (ENAME,SAL)

FROM (((EMP JOIN ASG ON EMP.ENO = ASG.ENO)

JOIN PROJ ON ASG.PNO = PROJ.PNO)

JOIN PAY ON EMP.TITLE = PAY.TITLE)

WHERE ((BUDGET>200000 OR DUR>24) AND (DUR>24 OR PNAME = "CAD/CAM"))

1. SELECT (ENAME,SAL)

FROM (EMP, (PROJ, (ASG, PAY)))

WHERE (EMP.ENO = ASG.ENO AND EMP.TITLE = PAY.TITLE

AND (BUDGET>200000 OR DUR>24) AND ASG.PNO = PROJ.PNO

AND (DUR>24 OR PNAME = "CAD/CAM"))

1. SELECT (ENAME,SAL)

FROM (((ASG JOIN PROJ ON ASG.PNO = PROJ.PNO)

JOIN PAY ON EMP.TITLE = PAY.TITLE)

JOIN EMP ON EMP.ENO = ASG.ENO)

WHERE ((BUDGET>200000 OR DUR>24) AND (DUR>24 OR PNAME = "CAD/CAM"))

1. **Learning outcomes (What I have learnt):** 
   * 1. **Learn about Aggregate function**
     2. **Learn about group by clause**
     3. **Learn about having clause with aggregate functions**

**Evaluation Grid:**

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| --- | --- | --- | --- |
| Sr. No. | Parameters | Marks Obtained | Maximum Marks |
| 1. | Demonstration and Performance  (Quiz) |  | 22 |
| 2. | Worksheet |  | 8 |