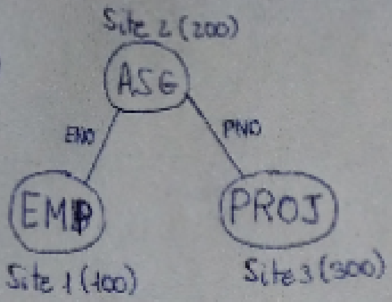
9.2)



To derive an optimal join program, we need to consider the transmission time and the access costs.

* Assume:
  - Tuple access costs: 1 unit
  - Tuple transfer costs: 1 unit

1. To keep transmission time to a minimum, we need to transfer the data from that site that has the lowest volume of tuples (e.g. size (EMP) = 100). Transfer this data to site 2, having a cost of 100.

2. Compute join operation at site 2, considering access costs (200 * 1). This results in 200 tuples.

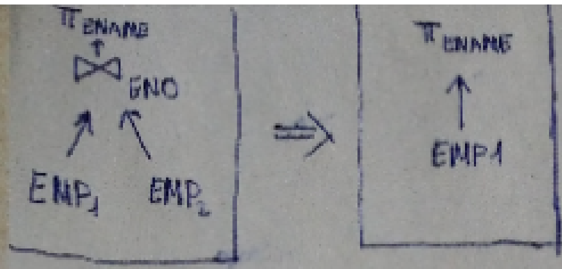
3. While the previous join operation generated 200 tuples at site 2, site 3 contains 300 operations. Minimizing transfer costs, the 200 tuples at site 2 should be transferred at site 3.

4. Join operation is then performed at site 3.

Costs

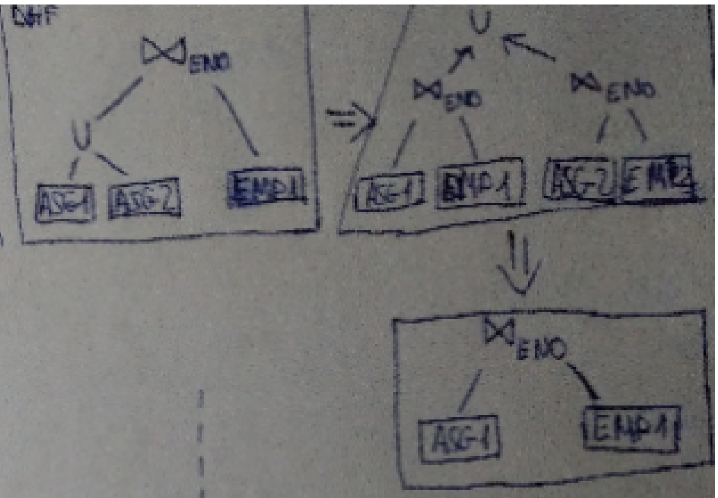
1.	100 * tuple transfer cost	100
2.	200 * tuple access cost	200
3.	200 * tuple transfer cost	200
4.	200 * tuple access cost	200
	Total Costs	700

* Transmission costs = 300



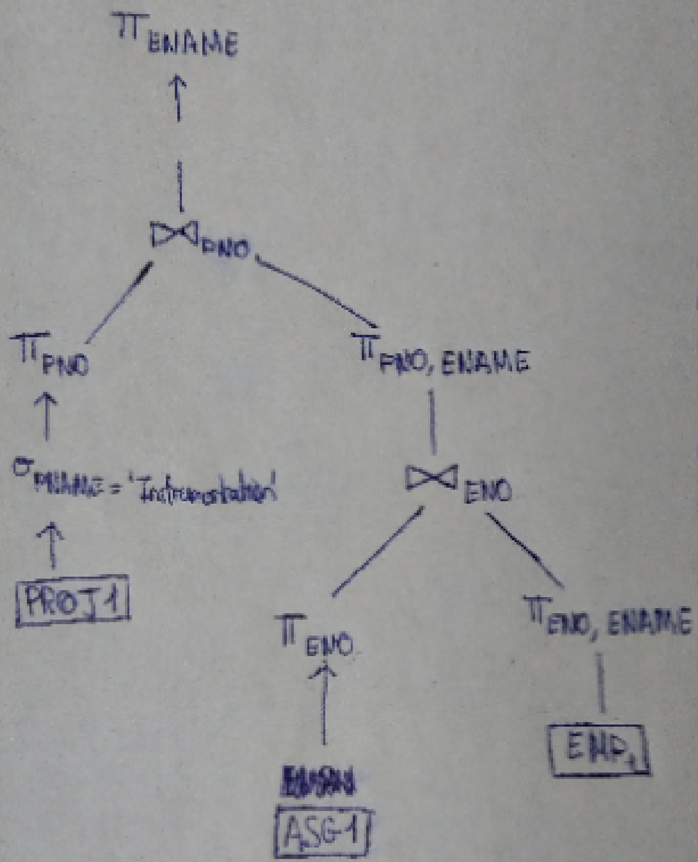
VF

, then



7.2)

Solutions:



∴ SELECT ENAME
FROM EMP1, ASG1, PROJ1
WHERE EMP1.ENO = ASG1.ENO
AND PROJ1.PNAME = "Instrumentation"
AND PROJ1.PNO = ASG1.PNO

DDMS HW2

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8.3)

$p_1 = \langle DUR > 12 \rangle$

$p_2 = \langle RESP = \text{'Analyst'} \rangle$

$p_3 = \langle EMP.ENO == ASG.ENO \rangle$

$p_4 = \langle Title = \text{'Elect. Eng.'} \rangle$

$p_5 = \langle ASG.PNO < \text{'P3'} \rangle$

$p_6 = \langle ASG.PNO == PROJ.PNO \rangle$

$(p_1 \vee p_2) \wedge (p_1 \vee \neg p_2)$

$= (p_1 \vee p_2) \wedge p_3 \wedge (p_4 \vee p_5) \wedge (p_1 \vee \neg p_2) \wedge p_6$

$= p_1 \wedge \overset{\text{true}}{(p_2 \vee \neg p_2)} \wedge p_3 \wedge (p_4 \vee p_5) \wedge p_6$

$= p_1 \wedge p_3 \wedge (p_4 \vee p_5) \wedge p_6$

Simplified Query

∴ SELECT ENAME, PNAME
FROM EMP, ASG, PROJ
WHERE DUR > 12
AND EMP.ENO = ASG.ENO
AND (Title = 'Elect. Eng' OR ASG.PNO < 'P3')
AND ASG.PNO = PROJ.PNO