Tutorial – 9

Q1.

1) Research_dept ← $\sigma_{Dname = 'Research'}$ (DEPARTMENT)

Research_Emps ← (Research_dept ⋈ DNumber = DNo (EMPLOYEE))

Result ← $\pi_{Fname, Lname, Address}$ (Research_Emps)

2) Stafford_Projs ← $\sigma_{Plocation = 'stafford'}$ (Project)

Contr_dept ← (Stafford_Projs ⋈ DNum = Dnumber (department))

Proj_dept_Mgr ← (Contr_dept ⋈ MgrSSN = SSN (Employee))

Result ← $\pi_{Pnumbet, DNum, LName, Address, Bdate}$ (Proj_Dept_Mgr)

3) Dept5_Projs(PNo) ← $\pi_{Pnumber}$ ($\sigma_{Dnum = 5}$ (Project))

Emp_Proj (SSN, PNo) ← $\pi_{ESSN, PNo}$ (Works_on)

Result_Emp_SSNs ← Emp_Proj ÷ Dept_Projs

Result ← $\pi_{Lname\ Fname}$ (Result_Emp_SSNs * Employee)

4) SMITHS(ESSN) ← π_{SSN} ($\pi_{Lname = 'smith'}$ (Employee))

Smith_worker_Proj ← π_{PNo} (Works_on * Smiths)

MGRS ← $\pi_{Lname, Dnumber}$ (Employee ⋈ ssn = MgrSSN Department)

Smith_Managed_depts (Dnum) ← $\pi_{Dnumber}$ ($\sigma_{Lname = 'smith'}$ (MGRS))

Smith_MGR_Projs(PNO) ← πPnumber (Smith_Managed_depts * project)

Result ← (Smith_worker_Projs ∪ Smith_MGR_Projs)

5) T_1 (SSN, No_of_Depts) ← ESSN count Dependent_name (Dependent)

T_2 ← σ No_of_depts ≥ 2 (T_1)
Result ← π Lname, Fname (T_2 * Employee)

6) All_Emps ← πSSN (Employee)
Emps_with_Deps(SSN) ← π ESSN (dependent)
Emps_without_deps ← (All_Emps − Emps_with_deps)
Result ← π Lname, Fname (Emps_without_Deps * Employee)

7) MGRS(SSN) ← π MGRSSN (Department)
Emps_with_Deps(SSN) ← π ESSN (dependent)
MGRS_with_Deps ← (MGRS ∩ Emps_with_deps)
Result ← π Lname, Fname (MGRS_with_Deps * Employee)

Q2

1) PLAYER[Player Name, Instrument]

2) Event where venue = 'Ulster Hall'

3) Player where Instrument = ('Violin' And Age < 40)
[Player name]

4) Player Join Player orchestra code = ORCHESTRA orchestra code ORCHESTRA)
[Player Name, Town]

5) (EVENT Join Player orchestra code = orchestra Orchestra code ORCHESTRA) where conductor = 'P. Mancini')
[Venue, Event Date]

6) (((EVENT JOIN Player orchestra code = ORCHESTRA orchestra code ORCHESTRA) Join Player orchestra code = ORCHESTRA orchestra code Player) where orchestra Name = 'Omagh Brass Ensemble')
[Player Name, Orchestra Name, Venue, Event Date]

7) (Player Join player Player name = orchestra conductor ORCHESTRA) [Player Name]

8) (Player [Player Name]) UNION (ORCHESTRA[conductor])