

Group Assignment 3

Int Elligence

Bhaskar Joshi (2019111002)

Utkarsh Upadhyay (2019101010)

Ayush Sharma (2019101004)

September 13, 2020

1 Section 1

Answer 1

$$\begin{aligned} EMP_DEP &\leftarrow EMPLOYEE \bowtie_{Dno = Dnumber} DEPARTMENT \\ RESULT &\leftarrow \pi_{Dname, Dno, AvgSalary}(Dno \Join_{AvgSalary} EMP_DEP) \end{aligned}$$

Answer 2

$$\begin{aligned} NEW_MGR &\leftarrow \sigma_{Mgr_start_date > 01.01.2019}(DEPARTMENT) \\ RESULT &\leftarrow \pi_{Dlocation}(NEW_MGR * DEPT_LOCATIONS) \end{aligned}$$

Answer 3

$$\begin{aligned} Sup_SSN &\leftarrow \pi_{Super_ssn}(EMPLOYEE) \\ Supervisor &\leftarrow EMPLOYEE \bowtie_{Ssn = Super_ssn} Sup_SSN \\ Emp &\leftarrow Supervisor \bowtie_{Ssn = Mgr_ssn} DEPARTMENT \\ RESULT &\leftarrow \pi_{Fname, Minit, Lname, Ssn, Bdate, Address, Sex, Salary, Super_ssn, Dno}(Emp) \end{aligned}$$

Answer 4

$$\begin{aligned} R(NumEmps) &\leftarrow \rho_{Dno} \mathfrak{S}_{CountSsn}(EMPLOYEE) \\ DN &\leftarrow \pi_{Dno}(\sigma_{NumEmps > 10}(R)) \\ RESULT(DNo, Numberofemployees) &\leftarrow (\rho_{Dno} \mathfrak{S}_{CountSsn}(\sigma_{Salary > 20K}(DN * EMPLOYEE))) \end{aligned}$$

Answer 5

$$\begin{aligned} Sup &\leftarrow \rho_{Bdate=Sup_Bdate, Ssn=Sup_Ssn}(\pi_{BDate, Ssn} EMPLOYEE) \\ Emp_Sup &\leftarrow EMPLOYEE \bowtie_{Super_ssn=Sup_Ssn} Sup \\ RESULT &\leftarrow \pi_{Fname, Minit, Lname, Ssn, Bdate, Address, Sex, Salary, Super_ssn, Dno}(\sigma_{Bdate < Sup_Bdate} Emp_Sup) \end{aligned}$$

Answer 6

$$\begin{aligned} Sup &\leftarrow \rho_{Dno=Sup_Dno, Ssn=Sup_Ssn}(\pi_{Dno, Ssn} EMPLOYEE) \\ Emp_Sup &\leftarrow EMPLOYEE \bowtie_{Super_ssn=Sup_Ssn} Sup \\ RESULT &\leftarrow \pi_{Fname, Minit, Lname, Ssn, Bdate, Address, Sex, Salary, Super_ssn, Dno}(\sigma_{Dno=Sup_Dno} Emp_Sup) \end{aligned}$$

Answer 7

$$\begin{aligned} E_DP &\leftarrow \pi_{Ssn, Dno, Dname}(EMPLOYEE \bowtie_{Dnumber=Dno} (DEPARTMENT)) \\ Total &\leftarrow \rho_{Essn} \mathfrak{S}_{Count_hours} WORKS_ON \\ EDP_hours &\leftarrow E_DP \bowtie_{Ssn=Essn} Total \\ RESULT &\leftarrow \pi_{Dname}(\sigma_{Count_hours > 20}(EDP_hours)) \end{aligned}$$

Answer 8

$$\begin{aligned} Work &\leftarrow \sigma_{(Pno=1 \text{ OR } Pno=2 \text{ OR } Pno=3)} WORKS_ON \\ RESULT &\leftarrow \pi_{Fname, Minit, Lname} (Work \bowtie_{Essn=Ssn} EMPLOYEE) \end{aligned}$$

Answer 9

$$\begin{aligned} Emp &\leftarrow \sigma_{Sex='Female' \text{ AND } Dname='X'} (EMPLOYEE \bowtie_{Dno=Dnumber} DEPARTMENT) \\ RESULT &\leftarrow \pi_{Fname, Minit, Lname, Ssn, Bdate, Address, Sex, Salary, Super_ssn, Dno} Emp \end{aligned}$$

Answer 10

$$RESULT \leftarrow \pi_{Count_Essn, AvgHrs} (Pno \bowtie_{Count_Essn, AvgHrs} WORKS_ON)$$

Answer 11

$$\begin{aligned} Dep &\leftarrow \sigma_{count>2}(\pi_{Essn, Count}(Essn \bowtie_{countDept_Name} Dependent)) \\ Emp_ssn &\leftarrow \pi_{Ssn}(EMPLOYEE \bowtie_{Ssn=Essn} Dep) \\ Sup &\leftarrow \rho_{Fname=SFname, Lname=SLname, Ssn=Sup_Ssn}(\pi_{Fname, Lname, Ssn} EMPLOYEE) \\ Emp_Sup &\leftarrow EMPLOYEE \bowtie_{Super_ssn=Sup_Ssn} Sup \\ RESULT &\leftarrow \pi_{Fname, Minit, Lname, Ssn, Bdate, Address, Sex, Salary, Super_ssn, Dno}(Emp_ssn \bowtie_{Ssn=Ssn} Emp_Sup) \end{aligned}$$

2 Section 2

Answer 6

$$\begin{aligned} Dep &\leftarrow \pi_{SSN, Dno}(ED) \\ Sup_Dep &\leftarrow \rho_{Dno=Sup_Dno}(ES \bowtie_{SupSSN=SSN} Dep) \\ ESD &\leftarrow Sup_Dep \bowtie_{ESSN=SSN} Dep \\ RESULT &\leftarrow \sigma_{Dno=Sup_Dno} ESD \end{aligned}$$

Answer 7

$$RESULT \leftarrow \pi_{DName}(\sigma_{Hours>20}(EDP))$$

Answer 8

$$RESULT \leftarrow \pi_{FName, LName}(\sigma_{(PNo=1 \text{ OR } PNo=2 \text{ OR } PNo=3)}(EDP))$$

Answer 9

$$RESULT \leftarrow \sigma_{Sex='Female' \text{ AND } DName='X'}(ED)$$

Answer 10

$$RESULT \leftarrow \pi_{Emp_count, AvgHour}(PNo \Join_{CountSsn, AverageHours}(EDP))$$

Answer 11

$$Required_Essn \leftarrow (\sigma_{Dependent_count > 2}(Essn \Join_{Dependent_count}(EDT)))$$

$$RESULT \leftarrow \pi_{ESSN, FName, LName, S FName, S LName}(ES * Required_Essn)$$