Solution tutorial N°04

Exercise 01 :

Q1. Provide the list of names and colors of all products.

A1: {P.Name-pro, P.Color| P∈ PRODUCT}

Q2. Find the names and stock quantities of red-colored products.

A2: {P.Name-pro, P.Qte-Stock| P∈ PRODUCT∧ P.Color='red'}

Q3. For each product in stock with a quantity greater than 100 and red in color, provide the supplier name who sold the product, and customer name who bought the product.

A3: {P.Num-pro, T.Name-Supplier, S.Name-Client| P∈ PRODUCT∧ P.Color='red'∧ P.Qte-Stock>100∧ T∈ PURCHASE∧ S∈ SALE ∧ P.Num-pro=T. Num-pro ∧ P.Num-pro=S. Num-pro }

Exercise 02:

Q1: Provide the names of all employees.

A1: {E.Name |E∈ EMPLOYEE}

Q2: Find the names and budgets of all projects.

A2: {P.Name-Proj, P.Budget |P∈ PROJECT}

Q3: Identify the job positions that have at least one employee.

A3: {E.Position |E∈ EMPLOYEE}

Q4: Find the employees who work in Algiers.

A4: {E.Num-E, E.Name |E∈ EMPLOYEE ∧ W∈ WORK ∧ P∈ PROJECT ∧ P. City-Proj='Algies' ∧ E.Num-E= W.Num-E ∧ W. Num-Proj=P. Num-Proj }

Q5: Determine the cities that contain either an employee or a project.

A5: {C |(E∈ EMPLOYEE∧ E.City-E=C) ∨(P∈PROJECT ∧ P.City-Proj=C)*}*

Q6: Identify the cities that contain projects but no employees.

A6: {C | (P∈PROJECT ∧ P.City-Proj=C) ∧ ∀ E ¬ (E∈ EMPLOYEE∧ E.City-E-=C) }

Q7: Provide the names of projects with a budget greater than 1000000 DA.

A7: {P.Name-Proj| P∈PROJECT ∧ P.Budget>1000000}

Q8: Find the names and budgets of projects where employee number 20 works.

A8: : {P.Name-Proj , P.Budget| P∈PROJECT ∧ W∈WORK ∧ W.Num-E=20∧ P.Num-Proj= W.Num-Proj }

Q9: Find the names of employees living in a city where there is at least one project.

A9: {E.Name |E∈EMPLOYEE∧ ∃ P∈PROJECT ∧E.City-E = P.City-Proj}

Q10: List the cities that contain both a project and an employee.

A10: {C | E∈EMPLOYEE∧E. City-E=C ∧ P∈PROJECT ∧ P.City-Proj=C }

Q11: Provide the names of employees working on a project with a budget exceeding 1,000,000 DA.

A: {E.Name |E∈EMPLOYEE∧ P∈PROJECT ∧P.Budget>1000000 ∧∃W∈ WORK∧ E.Num-E= W.Num-E∧W. Num-Proj=P. Num-Proj }

Q12: Identify the positions held by employees working on projects located in their own city of residence.

A12: {E.Position |E∈EMPLOYEE∧ W∈ WORK∧ P∈PROJECT ∧ E.Num-E= W.Num-E∧ P.Num-Proj = W.Num-Proj∧P. City-Proj=E.E.City-E }

Q13: Find the employees who are not working on any project.

A13: {E.Name |E∈EMPLOYEE∧ ∀W¬(W ∈ Work E.Num-E= W.Num-E) }

Q14: Find the employees who have worked more than 30 days on at least one project.

A14: {E.Name |E∈EMPLOYEE∧ ∃ W∈ Work ∧W.Duration >30∧ E.Num-E= W.Num-E) }

Exercise 03:

Q1: Identify vegetarian meals chosen by at least one guest.

A1: {M. Meal-Name | ∃I∈ INVITE ∧M∈MEAL∧ M.Type= ”vegetarian ∧I.Meal-ID= M.Meal-ID }

Q2: Find the names of guests who have not yet chosen a meal.

A2: {G.Name | G ∈GUEST∧ ∀I¬ (I∈ INVITE ∧ I.Guest-ID= G.Guest-ID) }

Q3: List the names and cities of guests who have chosen a meal with a price exceeding 500 DA.

A3: {G.Name, G.City | G ∈GUEST∧I∈ INVITE ∧M∈MEAL∧ M.Price>500 ∧ G.Guest-D= I.Guest-ID ∧I.Meal-ID = M.Meal-ID }

Q4: Find meals ID that have been chosen by all guest.

{I. Meal-ID | I∈INVITE∧ ∀G(G∈ GUEST →∃T ∈INVITE ∧ T.MeaL-ID= I.Meal-ID∧ T.Date= I.Date ∧ T.Guest-ID= G.Guestl-ID }