

# INFO90002 Labs: section 4 suggested solutions

## Week 3

### 1. List the green items of type C.

```
SELECT ItemName FROM Item
WHERE ItemType = "C"
AND ItemColour = "Green";
```

### 2. Find the departments that sell at least 4 items

```
SELECT DepartmentName FROM Department
WHERE DepartmentID IN
(SELECT DepartmentID FROM Sale
GROUP BY DepartmentID
HAVING COUNT(DISTINCT ItemID) > 3);
```

OR

```
SELECT DepartmentName FROM Department NATURAL JOIN Sale
GROUP BY DepartmentID
HAVING COUNT(DepartmentID) > 3;
```

### 3. Find the departments that sell at least 4 items and list how many items each department sells

```
SELECT DepartmentName, COUNT(DepartmentID) FROM Department NATURAL JOIN Sale
GROUP BY DepartmentID
HAVING COUNT(DepartmentID) > 3;
```

### 4. Find the employees who are in the same department as their manager.

```
SELECT Emp.EmployeeName FROM Employee AS Emp INNER JOIN Employee AS Boss
ON Emp.BossID = Boss.EmployeeID
WHERE Emp.DepartmentID = Boss.DepartmentID;
```

### 5. Find the names of brown items sold by the Recreation department.

```
SELECT ItemName FROM Item NATURAL JOIN Sale NATURAL JOIN Department
WHERE DepartmentName = "Recreation" AND ItemColour = "Brown";
```

### 6. Find the employees whose salary is less than half that of their managers.

```
SELECT Emp.EmployeeName FROM Employee AS Emp INNER JOIN Employee AS Boss
ON Boss.EmployeeID = Emp.BossID
WHERE Emp.EmployeeSalary <= (Boss.EmployeeSalary / 2);
```

## Week 4

### 7. Find the departments that have never sold a geo positioning system

```
SELECT DepartmentName FROM Department
WHERE DepartmentID NOT IN
(SELECT DepartmentID FROM Sale NATURAL JOIN Item
WHERE ItemName = "Geo Positioning System");
```

### 8. Find the items sold by at least two departments.

```
SELECT ItemName FROM SALE NATURAL JOIN Item
GROUP BY ItemName
HAVING COUNT(DepartmentID) >= 2;
```

### 9. Find the name of the highest-paid employee in the Marketing department.

```
SELECT EmployeeName FROM Employee
WHERE EmployeeSalary =
(SELECT MAX(EmployeeSalary) FROM Employee NATURAL JOIN Department
WHERE DepartmentName = "Marketing");
```

### 10. Find the names of employees who make 40 per cent less than the average salary.

```
SELECT EmployeeName, EmployeeSalary FROM Employee
WHERE EmployeeSalary <
(SELECT AVG(EmployeeSalary)*0.60 FROM Employee);
```

### 11. Find the number of employees with a salary under \$15,000

```
SELECT COUNT(EmployeeID) FROM Employee
WHERE EmployeeSalary < 15000;
```

### 12. Find the number of units sold of each item.

```
SELECT ItemName, COUNT(SaleQTY) AS UnitsSold
FROM Sale NATURAL JOIN Item
GROUP BY ItemName;
```

### 13. Find the supplier that delivers no more than two items

```
SELECT SupplierName, COUNT(Supplier.SupplierID) FROM Delivery INNER JOIN Supplier
ON Supplier.SupplierID = Delivery.SupplierID
GROUP BY SupplierName
HAVING COUNT(Supplier.SupplierID) <= 2;
```

## Week 5

### 14. Find the suppliers that have never delivered a compass.

```
SELECT DISTINCT SupplierName FROM Delivery NATURAL JOIN Supplier
WHERE Delivery.SupplierID NOT IN
(SELECT SupplierID FROM Delivery NATURAL JOIN Item
WHERE Itemname = 'Compass');
```

### 15. Find, for each department, its floor and the average salary in the department.

```
SELECT Department.DepartmentName, Department.DepartmentFloor, AVG(EmployeeSalary)
FROM Employee, Department
WHERE Department.DepartmentID = Employee.DepartmentID
GROUP BY Department.DepartmentName, Department.DepartmentFloor;
```

### 16. List the departments on the second floor.

```
SELECT DepartmentName FROM Department
WHERE DepartmentFloor = 2;
```

### 17. List the names of items delivered by each supplier. Arrange the report by supplier name, and within supplier name, list the items in alphabetical order.

```
SELECT DISTINCT SupplierName, ItemName FROM Supplier INNER JOIN Delivery INNER JOIN Item
ON Delivery.SupplierID = Supplier.SupplierID
AND Item.ItemID = Delivery.ItemID
ORDER BY SupplierName, ItemName;
```

### 18. List the number of employees in each department.

```
SELECT DepartmentName, COUNT(DepartmentName)
FROM Employee NATURAL JOIN Department
GROUP BY DepartmentName;
```

### 19. Whom does Todd manage? [could use a self join]

```
SELECT EmployeeName FROM Employee
WHERE BossID IN
(SELECT EmployeeID FROM Employee
WHERE EmployeeName = "Todd");
```

### 20. Find the name of Sophie's boss. [could use a join]

```
SELECT EmployeeName FROM Employee
WHERE EmployeeID IN
(SELECT BossID FROM Employee
WHERE EmployeeName = 'Sophie');
```

## Week 6

**21. List the names of each manager and their employees arranged by manager's name and employee's name within manager.**

```
SELECT boss.EmployeeName AS Manager, emp.EmployeeName AS Employee
FROM Employee AS emp, Employee AS boss
WHERE emp.BossID = boss.EmployeeID
ORDER BY boss.EmployeeName, emp.EmployeeName;
```

**22. Who earns the lowest salary?**

```
SELECT EmployeeName FROM Employee
WHERE EmployeeSalary = (SELECT MIN(EmployeeSalary) FROM Employee);
```

**23. Of those items delivered, find the items not delivered to the Books department.**

```
SELECT DISTINCT ItemName FROM Delivery NATURAL JOIN Item
WHERE Delivery.ItemID NOT IN
(SELECT DISTINCT ItemID FROM Delivery NATURAL JOIN Department
WHERE DepartmentName = 'Books');
```

**24. Find the departments that have sold compasses and at least six other items.**

```
SELECT DepartmentName FROM Department
WHERE DepartmentID IN
(SELECT DepartmentID FROM Sale NATURAL JOIN Item
WHERE ItemName = 'Compass' AND DepartmentID IN
(SELECT DepartmentID FROM Sale
GROUP BY DepartmentID
HAVING COUNT(DISTINCT ItemID) > 6));
```

**25. Find the brown items sold by no department on the second floor.**

```
SELECT ItemName FROM Item
WHERE ItemColour = 'Brown'
AND ItemID NOT IN
(SELECT ItemID FROM SALE NATURAL JOIN Department
WHERE Sale.DepartmentID = Department.DepartmentID
AND DepartmentFloor = 2);
```

**26. Find the items delivered by all suppliers**

```
SELECT Delivery.ItemID FROM Delivery, Supplier
WHERE Delivery.SupplierID = Supplier.SupplierID
GROUP BY Delivery.ItemID
HAVING COUNT(DISTINCT Supplier.SupplierID) =
(SELECT COUNT(DISTINCT SupplierID) FROM Supplier);
```

**27. Find the items not delivered by Nepalese Corp**

```
SELECT DISTINCT ItemName FROM Item WHERE ItemID NOT IN
(SELECT ItemID FROM Delivery NATURAL JOIN Supplier
WHERE SupplierName = "Nepalese Corp.");
```

## Week 7

28. Find the items delivered for which there have been no sales.

```
SELECT DISTINCT ItemName FROM Delivery NATURAL JOIN Item
WHERE ItemID NOT IN
  (SELECT DISTINCT ItemID FROM Sale);
```

29. Find the names of employees with a salary greater than the minimum salary paid to a manager.

```
SELECT EmployeeID, EmployeeName, EmployeeSalary FROM Employee
WHERE EmployeeSalary >
  (SELECT MIN(EmployeeSalary) FROM Employee
   WHERE EmployeeID IN
     (SELECT DISTINCT BossID FROM Employee));
```

30. Find the names of suppliers that do not supply compasses or geopositioning systems.

```
SELECT SupplierName FROM Supplier
WHERE SupplierID NOT IN
  (SELECT SupplierID FROM Delivery NATURAL JOIN Item
   WHERE ItemName = 'Compass'
   OR ItemName = 'Geopositioning System');
```

31. Find the number of items of type C sold by the departments on the third floor.

```
SELECT COUNT(Sale.ItemID) FROM Sale INNER JOIN Item INNER JOIN Department
  ON Item.ItemID = Sale.ItemID
  AND Department.DepartmentID = Sale.DepartmentID
WHERE Department.DepartmentFloor = 3
  AND Item.ItemType = 'C';
```

32. If Nancy's boss has a boss, who is it?

```
SELECT EmployeeName FROM Employee
WHERE EmployeeID IN
  (SELECT BossID FROM Employee
   WHERE EmployeeID IN
     (SELECT BossID FROM Employee
      WHERE EmployeeName = "Nancy"));
```

**33. List each employee and the difference between his or her salary and the average salary of his or her department.**

```
CREATE VIEW AVGdeptsal(DepartmentID, dpavgsal) AS /* here, using a view */
SELECT DepartmentID, AVG(EmployeeSalary) AS dpavgsal FROM Employee
GROUP BY DepartmentID;
```

```
SELECT EmployeeName, EmployeeSalary-dpavgsal FROM Employee, AVGdeptsal
WHERE Employee.DepartmentID = AVGdeptsal.DepartmentID;
```

**34. List the departments on the second floor that contain more than one employee.**

```
SELECT DepartmentName FROM Department
WHERE DepartmentFloor = 2
AND DepartmentID IN
(SELECT DepartmentID FROM Employee
GROUP BY DepartmentID
HAVING COUNT(*) > 1);
```

## Week 8

**35. List the names of employees who earn more than the average salary of employees in the Accounting department.**

```
SELECT EmployeeName FROM Employee
WHERE EmployeeSalary >
(SELECT AVG(EmployeeSalary) FROM Employee
INNER JOIN Department
ON Employee.DepartmentID = Department.DepartmentID
WHERE DepartmentName = "Accounting");
```

**36. List the names of managers who supervise only one person.**

```
SELECT EmployeeName FROM EMPLOYEE
WHERE EmployeeID IN
(SELECT BossID FROM Employee
GROUP BY BossID
HAVING COUNT(BossID) = 1);
```

**37. List the names of employees who earn less than the minimum salary of the Marketing department.**

```
SELECT EmployeeName FROM Employee
WHERE EmployeeSalary <
  (SELECT MIN(EmployeeSalary) FROM Employee
   INNER JOIN Department
     ON Employee.DepartmentID = Department.DepartmentID
   WHERE DepartmentName = "Marketing");
```

**38. List the department and the item where the department is the only seller of that item.**

```
SELECT DISTINCT DepartmentName, Itemname
FROM Sale sale1 NATURAL JOIN Department NATURAL JOIN Item
WHERE sale1.ItemID NOT IN
  (SELECT ItemID FROM Sale sale2
   WHERE sale1.DepartmentID <> sale2.DepartmentID);
```

**39. Which department has the highest average salary?**

```
CREATE VIEW aavgdeptsal(DepartmentID, dpavgsal) AS
SELECT DepartmentID, AVG(EmployeeSalary) AS dpavgsal FROM Employee
GROUP BY DepartmentID;

SELECT DepartmentID FROM AVGdeptsal NATURAL JOIN Department
WHERE dpavgsal = (SELECT MAX(dpavgsal) FROM AVGdeptsal);
```

**40. Find the khaki items delivered by all suppliers.**

```
SELECT ItemName FROM Item
WHERE Item.ItemColour = 'Khaki'
AND NOT EXISTS
  (SELECT * FROM Supplier
   WHERE NOT EXISTS
     (SELECT * FROM Delivery
      WHERE Delivery.ItemID = Item.ItemID
      AND Delivery.SupplierID = Supplier.SupplierID));
```

**41. Find the suppliers that deliver to all departments. Don't forget to exclude the administrative departments, which don't sell items.**

```
SELECT SupplierName FROM Supplier
WHERE NOT EXISTS
  (SELECT * FROM Department
   WHERE DepartmentName NOT IN ('Management', 'Marketing', 'Personnel',
                                'Accounting', 'Purchasing')

  AND NOT EXISTS
    (SELECT * FROM Delivery
     WHERE Delivery.SupplierID = Supplier.SupplierID
       AND Delivery.DepartmentID = Department.DepartmentID));
```

**42. Find the items delivered to all departments except administration departments (Management, Marketing, Personnel, Accounting, Purchasing).**

```
SELECT ItemID, ItemName FROM Item
WHERE NOT EXISTS
  (SELECT * FROM Department
   WHERE DepartmentName NOT IN ('Management', 'Marketing', 'Personnel',
                                'Accounting', 'Purchasing')

  AND NOT EXISTS
    (SELECT * FROM Delivery
     WHERE Delivery.ItemID = Item.ItemID
       AND Delivery.DepartmentID = Department.DepartmentID));
```