**Exercise**

**Objective:** A refresher to your RDBMS course.

**Create the following Tables as per the Specification**

**CUSTOMER**

TYPE NULLS SIZE

customer\_number I Y -9(10)

customer\_name CF N X(30)

parent\_customer\_number I Y -9(10)

sales\_employee\_number I Y -9(10)

|  |  |  |  |
| --- | --- | --- | --- |
| Customer | Customer | Parent Customer Number | Employee Number |
| 9 | MoreDataEnterprise | ? | 1023 |
| 18 | WallStreetConnection | ? | 1023 |
| 11 | HotelCalifornia | ? | 1015 |
| 8 | ColbyCo. | ? | 1018 |
| 2 | SimpleInstruments | 1 | 1015 |
| 13 | FirstAmerican | 3 | 1023 |
| 4 | SumBank | 3 | 1023 |
| 0 | CorporateHeadquarters | ? | ? |
| 6 | LibertyTours | ? | 1023 |
| 3 | FirstAmerican | ? | 1023 |
| 7 | Creamof | ? | 1018 |
| 17 | EastCoast | ? | 1023 |
| 12 | CheapRentals | ? | 1018 |
| 10 | GraduatesJob | ? | 1015 |
| 19 | MoreData | 9 | 1015 |
| 14 | MetroSavings | ? | 1018 |
| 5 | FederalBureau | ? | 1018 |
| 1 | Ato | ? | 1015 |
| 16 | VIPInvestments | 3 | 1023 |
| 15 | CatesModeling | ? | 1015 |
| 20 | MetroSavings | 14 | 1018 |

**CONTACT**

contact\_number I Y -9(10)

contact\_name CV N X(30)

area\_code I2 N -9(5)

phone I N -9(10)

extension I Y -9(10)

last\_call\_date DA N YY/MM/DD

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Contact Number | Contact Name | Area Code | Phone | Extension | Call Date |
| 8007 | Smith, Ginny | 408 | 3792152 | 333 | 88/8/5 |
| 8010 | Brayton, Connie | 408 | 1112345 | 112 | 87/7/21 |
| 8005 | Hughes, Jack | 212 | 5432126 | 710 | 87/8/5 |
| 8001 | Leblanc, James | 805 | 2213456 | 221 | 87/8/1 |
| 8008 | Torres, Alison | 802 | 5487890 | 444 | 88/8/14 |
| 8015 | Dibble, Nancy | 602 | 2713387 | 652 | 88/8/9 |

**DEPARTMENT**

department\_number I2 Y -9(5)

department\_name CF N X(30)

budget\_amount D Y -9(9).99

manager\_employee\_number I Y -9(10)

|  |  |  |  |
| --- | --- | --- | --- |
| **Department Number** | **Department Name** | **Budget** | **Employee** |
| 100 | President | 400000 | 801 |
| 600 | None | NULL | 1099 |
| 403 | education | 932000 | 1005 |
| 301 | research and development | 465600 | 1005 |
| 302 | product planning | 226000 | 1016 |
| 401 | customer support | 982300 | 1003 |
| 201 | technical operations | 293800 | 1025 |
| 402 | software support | 308000 | 1011 |
| 501 | marketing sales | 308000 | 1017 |

**EMPLOYEE**

employee\_number I Y -9(10)

manager\_employee\_number I Y -9(10)

department\_number I Y -9(10)

job\_code I Y -9(10)

last\_name CF N x(20)

first\_name CV N X(30)

hire\_date DA N YY/MM/DD

birthdate DA N YY/MM/DD

salary\_amount D N -(6).99

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Emp No** | **Manager Emp No** | **Dept No** | **Job cd** | **Lasat Name** | **First Name** | **Hire Dt** | **BirthDt** | **Salary Amt** |
| 1008 | 1003 | 401 | 412101 | Rogers | Frank | 77/02/01 | 58/05/17 | 29250 |
| 1010 | 1019 | 301 | 312102 | Kanieski | Carol | 77/03/01 | 35/04/23 | 46000 |
| 1014 | 1011 | 402 | 422101 | Crane | Robert | 78/01/15 | 60/07/04 | 24500 |
| 1006 | 1019 | 301 | 312101 | Stein | John- | 76/10/15 | 53/10/15 | 29450 |
| 1017 | 801 | 501 | 511100 | Runyon | Irene | 78/05/01 | 51/11/10 | 66000 |
| 1003 | 801 | 401 | 411100 | Trader | James | 76/07/31 | 47/06/19 | 37850 |
| 1019 | 801 | 301 | 311100 | Kubic | Ron | 78/08/01 | 42/12/11 | 57700 |
| 1011 | 801 | 402 | 421100 | Daly | James | 77/03/15 | 49/12/11 | 52500 |
| 1013 | 1003 | 401 | 412102 | Phillips | Charles | 77/04/01 | 63/08/10 | 24500 |
| 1009 | 1005 | 403 | 432101 | Lombardo | Domingus | 77/02/01 | 45/11/15 | 31000 |
| 1025 | 801 | 201 | 211100 | Short | Michael | 79/05/01 | 47/07/07 | 34700 |
| 1024 | 1005 | 403 | 432101 | Brown | Allen | 79/05/01 | 54/01/16 | 43700 |
| 1007 | 1005 | 403 | 432101 | Villegas | Arnando | 77/01/02 | 37/01/31 | 49700 |
| 1005 | 801 | 403 | 431100 | Ryan | Loretta | 76/10/15 | 55/09/10 | 31200 |
| 1021 | 1025 | 201 | 222101 | Morrissey | Jim | 78/10/01 | 43/04/29 | 38750 |
| 1020 | 1005 | 403 | 432101 | Charles | John | 78/10/01 | 49/06/21 | 39500 |
| 1022 | 1003 | 401 | 412102 | Machado | Albert | 79/03/01 | 57/07/14 | 32300 |
| 801 | 801 | 100 | 111100 | Trainer | I.B. | 73/03/01 | 45/08/11 | 100000 |
| 1015 | 1017 | 501 | 512101 | Wilson | Edward | 78/03/01 | 57/03/04 | 53625 |
| 1002 | 1003 | 401 | 413201 | Brown | Alan | 76/07/31 | 44/08/09 | 43100 |
| 1004 | 1003 | 401 | 412101 | Johnson | Darlene | 76/10/15 | 46/04/23 | 36300 |
| 1016 | 801 | 302 | 321100 | Rogers | Nora | 78/03/01 | 59/09/04 | 56500 |
| 1018 | 1017 | 501 | 512101 | Ratzlaff | Larry | 78/07/15 | 54/05/31 | 54000 |
| 1001 | 1003 | 401 | 412101 | Hoover | William | 76/06/18 | 50/01/14 | 25525 |
| 1023 | 1017 | 501 | 512101 | Rabbit | Peter | 79/03/01 | 62/10/29 | 26500 |
| 1012 | 1005 | 403 | 432101 | Hopkins | Paulene | 77/03/15 | 42/02/18 | 37900 |

**EMPLOYEE\_PHONE**

employee\_number I N -9(10)

area\_code I2 N -9(5)

phone I N -9(10)

extension I Y -9(10)

comment\_line CF Y X(72)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Emp No** | **Area cd** | **Phone** | **Extension** | **Comment** |
| 1008 | 213 | 3788092 | ? | ? |
| 1010 | 202 | 5456187 | ? | ? |
| 1003 | 213 | 3774534 | ? | ? |
| 1014 | 213 | 8278777 | 442 | ? |
| 1006 | 213 | 8278777 | 410 | ? |
| 1017 | 213 | 8278777 | 425 | ? |
| 1019 | 213 | 8278777 | 418 | ? |
| 1011 | 213 | 8278777 | 422 | ? |
| 1010 | 213 | 8278777 | ? | ? |
| 1014 | 213 | 2528809 | ? | ? |
| 1006 | 213 | 3716087 | ? | ? |
| 1017 | 213 | 9231070 | ? | ? |
| 1019 | 213 | 2640855 | ? | ? |
| 1011 | 213 | 3549138 | ? | ? |
| 1008 | 213 | 8278777 | 429 | ? |
| 1003 | 213 | 8278777 | 401 | ? |
| 1010 | 202 | 3239119 | ? | ? |
| 1007 | 213 | 2274764 | ? | ? |
| 1005 | 213 | 2514189 | ? | ? |
| 1013 | 213 | 8278777 | 411 | ? |
| 1025 | 213 | 8278777 | 429 | ? |
| 1024 | 213 | 8278777 | 417 | ? |
| 1021 | 213 | 8278777 | 428 | ? |
| 1013 | 213 | 9857506 | ? | ? |
| 1010 | 804 | 9230911 | ? | ? |
| 1025 | 213 | 2964652 | ? | ? |
| 1024 | 213 | 2724743 | ? | ? |
| 1021 | 213 | 2659291 | ? | ? |
| 1007 | 213 | 8278777 | 440 | ? |
| 1005 | 213 | 8278777 | 415 | ? |
| 1010 | 313 | 4630300 | ? | ? |
| 1002 | 213 | 2721606 | ? | ? |
| 1004 | 212 | 7230101 | ? | ? |
| 1022 | 213 | 8278777 | 416 | ? |
| 801 | 213 | 8278777 | 0 | ? |
| 1015 | 213 | 8278777 | 436 | ? |
| 1010 | 312 | 990988 |  | ? |
| 1022 | 213 | 4982012 | ? | ? |
| 1018 | 202 | 3239119 | ? | ? |
| 1015 | 213 | 3012906 | ? | ? |
| 1004 | 212 | 7232121 | ? | ? |
| 1002 | 213 | 8278777 | 439 | ? |
| 1018 | 804 | 2989791 | ? | ? |
| 1015 | 415 | 4491225 | ? | ? |
| 1023 | 212 | 7232121 | ? | ? |
| 1010 | 804 | 4563000 | 370 | ? |
| 1016 | 213 | 8278777 | 412 | ? |
| 1004 | 609 | 5591011 | 213 | ? |
| 1016 | 213 | 2925224 | ? | ? |
| 1015 | 415 | 9237892 | ? | ? |
| 1023 | 212 | 8283747 | ? | ? |
| 1010 | 804 | 4563000 | 375 | ? |
| 1012 | 213 | 8278777 | 418 | ? |
| 1004 | 609 | 5591011 | 224 | ? |
| 1010 | 312 | 5692122 | ? | ? |
| 1012 | 213 | 9788422 | ? | ? |
| 1001 | 415 | 2412021 | ? | ? |
| 1023 | 609 | 5591011 | 213 | ? |
| 1004 | 609 | 5591011 | 225 | ? |
| 1009 | 213 | 2482619 | ? | ? |
| 1001 | 415 | 3563560 | ? | ? |
| 1004 | 609 | 5785781 | ? | ? |
| 1001 | 213 | 2872019 | ? | ? |
| 1004 | 212 | 5786099 | ? | ? |
| 1009 | 213 | 8278777 | 413 | ? |
| 1001 | 415 | 6567000 | ? | ? |
| 1004 | 919 | 9789000 | ? | ? |
| 1020 | 213 | 8278777 | 433 | ? |
| 1020 | 213 | 2248513 | ? | ? |
| 1001 | 415 | 4491221 | ? | ? |
| 1004 | 617 | 7567676 | ? | ? |
| 1001 | 415 | 4491225 | ? | ? |
| 1004 | 212 | 8282828 | ? | ? |
| 1001 | 415 | 4491244 | ? | ? |
| 1004 | 718 | 2243283 | ? | ? |
| 1001 | 415 | 9234864 | ? | ? |
| 1004 | 212 | 4909190 | ? | ? |
| 1001 | 415 | 9237892 | ? | ? |

**JOB TYPE** NULLS SIZE

job\_code I Y -9(10)

description CV N X(40)

hourly\_billing\_rate D Y -(5).99

hourly\_cost\_rate D Y -(5).99

|  |  |  |  |
| --- | --- | --- | --- |
| **Job Code** | **Billing Description** | **Hourly Billing Rate** | **Hourly Cost Rate** |
| 312101 | Software-Engineer | .00 .00 | .00 .00 |
| 432101 | Instructor | .00 .00 | .00 .00 |
| 413201 | Dispatcher | .00 .00 | .00 .00 |
| 111100 | Corporate President | .00 .00 | .00 .00 |
| 421100 | Manager Software Support | .00 .00 | .00 .00 |
| 104201 | Electronic Assembler | .00 .00 | .00 .00 |
| 312102 | Hardware Engineer | .00 .00 | .00 .00 |
| 321100 | Manager - Product Planning | .00 .00 | .00 .00 |
| 412101 | Field Engineer | .00 .00 | .00 .00 |
| 322101 | Planning Specialist | .00 .00 | .00 .00 |
| 511100 | Manager - Marketing Sales | .00 .00 | .00 .00 |
| 431100 | Manager - Education | .00 .00 | .00 .00 |
| 311100 | Manager - Reasearch and Development | .00 .00 | .00 .00 |
| 411100 | Manager - Customer Support | .00 .00 | .00 .00 |
| 104202 | Mechanical Assembler | .00 .00 | .00 .00 |
| 412102 | Product Specialist | .00 .00 | .00 .00 |
| 512101 | Sales Rep | .00 .00 | .00 .00 |
| 412103 | System Support Analyst | .00 .00 | .00 .00 |
| 222101 | System Analyst | .00 .00 | .00 .00 |
| 422101 | Software Analyst | .00 .00 | .00 .00 |

***Legend***

***I integer***

***I2 small integer***

***D decimal***

***DA date***

***CF character, fixed***

***CV character, variable***

**Questions:**

Use the Employees DB provided and write SQL queries as per the requirement stated below

Write a SQL to retrieve

1. Department information Department and employee information for departments that have been assigned to employees (matching rows).

Modify to include employees who have an invalid or null job\_code. Select the last\_name, job\_code and job description. Sort by last name. Use an outer join to accomplish this.

1. Department information where no employees have those department numbers
2. Employee information for employees with valid department numbers
3. Employee information for employees with invalid or null department numbers
4. Information for employees who have null or invalid department numbers.
5. List all department managers who do not have subordinate employees.
6. Show the employee number, department number and job code of employees whose department is less than <>. Sort the result by job code within department.
7. Produce a sorted list of valid employee numbers who are department managers. This is a referential integrity check between department and employee tables. Do this as a subquery using NOT IN, and then again using the INTERSECT operator.
8. Display the full name of employees whose last name contains ”Ra”, any combination of upper and lower case, using the syntax LIKE ‘%Ra%’.
9. Display the name and the employee number for employees who either earn less than $35,000 annually or work in department 403.
10. Select the name, department number, and job code for employees in departments 401 or 403, who have the job code 412101 or 432101.
11. Management has requested a report of all employees in departments 501, 301, and 201 who earn more than $30,000. Show employee number, department number, and salary. Sort the report by department number, and salary amount within department.
12. Make an alphabetical list of department 401 employees with their monthly salary.
13. Who has worked for the company for at least ten years?
14. Display the current DATE, TIME, DATABASE and USER in a single SELECT statement.
15. What is the date 365 days from today? What month will it be in 60 days? What is the date two months from today?
16. You need to find all the employees who are department managers. You do not want to enter them manually. Use a SELECT subquery.
17. Who are the department managers whose salaries are less than $35,000 and whose budget amounts are greater than $900,000?
18. Who are the employees who work in support departments?
19. Which departments have no employees?
20. Do any departments have no employees?
21. Do any employees work in department 600?
22. Use EXISTS to determine if any job\_codes are unassigned to employees. Return ‘TRUE’ if there are unassigned job codes.
23. Find the employee with the highest salary in each department
24. Find all employees whose salary is greater than the department average salary.
25. Do any employees work in department 600? Use Exists.
26. Which job codes are not assigned to any employee? Use Not in & Not exists
27. Show the employee number, department number, and salary of all department managers who have the highest salary in their department.
28. Show all employees whose salary is greater than the company average. Use Derived Tables.
29. Show all employees whose salary is greater than the departmental average. Use Derived Tables.
30. Use a correlated subquery to produce a report showing employee last name, salary, and department number for all employees whose salary is greater than their department average. Sort by salary within department number.