SAP HANA LAB BOOK

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1.1 Overview

This lab book is a guided tour for learning SAP HANA. It comprises of assignments to be done. Refer the demos and work out the assignments given by referring the case studies which will expose you to work with Java applications.

1.2 Setup Checklist for SAP HANA

Here is what is expected on your machine in order to work with lab assignment.

Minimum System Requirements

- Intel Pentium 90 or higher (P166 recommended)
- Microsoft Windows 2010 or higher.
- Memory: (8GB or more recommended)

Please ensure that the following is done:

- SAP GUI is installed
- Connection to the SAP Server and HANA Server
- Java, Eclipse configured

Lab 1-1 Execute Queries in HANA Modeler using SQL

Goals	• How to use Execute Queries in HANA Modeler using SQL
Time	4 hours
Lab Setup	• Connectivity to SAP server and HANA Server • Login details for connecting to SAP server and HANA server

1. Data Query Language.

Use SQL in HANA Modeler to solve the below queries.

1. List the Name and Designation code of the staff who have joined before Jan 2003 and whose salary range is between 12000 and 25000. Display the columns with user defined Column headers. Hint: Use As clause along with other operators
2. List the staff code, name, and department number of the staff who have experience of 18 or more years and sort them based on their experience.
3. Display the staff details who do not have manager. Hint: Use is null
4. Display the Book details that were published during the period of 2001 to 2004. Also display book details with Book name having the character '&' anywhere.
5. List the names of the staff having '_' character in their name.
6. Write a query to display the following output. Query the Department_Master Table.

   Hint: Use Case, End case.

	DEPARTMENT_NAME	DEPARTMENT_CODE	DEPT_CODE
1	Computer Science	10	Ten
2	Electricals	20	Twenty
3	Electronics	30	Thirty
4	Mechanics	40	Fourty
5	Robotics	50	Fifty

7. Write a query to display the following output. Query the Staff_Master Table.

   Hint: Use Case, End case.

	STAFF_CODE	STAFF_NAME	DEPT_CODE
1	100,001	Arvind	Electronics
2	100,002	Shyam	Electiricals
3	100,003	Mohan	Computer Science
4	100,004	Anil	Electiricals
5	100,005	John	Computer Science
6	100,006	Allen	Electronics
7	100,007	Smith	Electiricals
8	100,008	Raviraj	Mechanics
9	100,009	Rahul	Electiricals
10	100,010	Ram	Electronics

2. Group Functions:

1. Display the Highest, Lowest, Total & Average salary of all staff. Label the columns Maximum, Minimum, Total and Average respectively for each Department code. Also round the result to the nearest whole number.
2. Get the Department number, and sum of Salary of all non-managers where the sum is greater than 20000.

3. Joins and Subqueries

1. Write a query which displays Staff Name, Department Code, Department Name, and Salary for all staff who earns more than 20000.
2. Display Staff Code, Staff Name, Department Name, and his manager's number and name. Label the columns Staff#, Staff, Mgr#, Manager.
3. Create a query that will display Student Code, Student Name, Book Code, and Book Name for all students whose expected book return date is today.

4. Write a program in SE38 to retrieve records from zdept_Mas and zstaff_Master.
Retrieve Staff_code, Staff_Name and Staff_Sal from zstaff_Master.
Retrieve Dept_code Dept_Name from zdept_Mas.
Download the contents on a local file on your machine.

Lab 2-1 Execute ADBC Programs

Goals	• How to use execute ADBC programs in SAP GUI
Time	4 hours
Lab Setup	• Connectivity to SAP server and HANA Server • Login details for connecting to SAP server and HANA server

1. Write select queries to:
    a. List the Name and Designation code of the staff who have joined before Jan 2003 and whose salary range is between 12000 and 25000.
    b. Display Staff Name, Department Code, Department Name, and Salary for all staff who earns more than 20000.
    c. Display Staff Name, Department Code, Department Name, and Salary for all staff. Use Case End Case .

       If the salary is between 15000 and 25000 then Grade should be 'Low'

       If the salary is between 25001 and 40000 then Grade should be 'Medium'

       If the salary is between 45001 and 65000 then Grade should be 'High'
    d. Display the Empno and Role from ZROLE1 and ZROLE2 tables.

       Hint: Use Union and Union All.

    Use SQL - HANA Modeler to solve the above queries.
2. Do the above queries using ADBC Programs.

   Write separate programs in SE38 and execute it.
3. Write a report to display sum of salary dept wise. Use the zstaff_master table.

   Hint: use Internal tables control break statements.
4. Write an SQL query to do the above.
5. Write an ADBC program for the above SQL Query.

Lab 3-1 Create Calculation Views using Script

Goals	How to Create Calculation Views using Script
Time	4 hours
Lab Setup	• Connectivity to SAP server and HANA Server • Login details for connecting to SAP server and HANA server

1. Create calculation view as below.

   ZXXXXXX_calc view which displays sum of staff_sal dept_code wise.

   Where XXXXXX is your employee code.

   Use the zstaff_master table.

2. Write an ADBC program to consume the above calculation view.
3. Create an external view for the above calculation view. Name the external view as ZXXXXXX_Ext_View where XXXXXX is your employee code
4. Write a SE38 program to see the contents of the above external view.

Lab 3-1 ABAP on HANA

Goals	How to use new ABAP Syntax
Time	4 hours
Lab Setup	• Connectivity to SAP server and HANA Server • Login details for connecting to SAP server and HANA server

1. Display the sum of 2 numbers using inline declaration.
2. Concatenate your first name and last name separated by a space into a variable fullname. Display the fullname.
3. Select Staff Name, Department Code, and Salary for all staff into an Internal Table. Display the contents of the Internal table. Use the zstaff_master table.
4. Create a copy of the above program(Assign 3). Modify it to retrieve the dept_name also. Use Join. Use the zstaff_master and zdept_mas tables.

   Display the contents of the Internal table.
5. Create a copy of the above program(Assign 4). Modify it to display the Grade as per the conditions mentioned below. Use Case End case.

   If the salary is between 15000 and 25000 then Grade should be 'Low'

   If the salary is between 25001 and 40000 then Grade should be 'Medium'

   If the salary is between 45001 and 65000 then Grade should be 'High'
6. Select Staff Name, Department Code, hiredate and Salary for all staff into an Internal Table. Display the contents of the Internal table. Use functions to display the Staff Name in Upper Case and Lower Case. Display hiredate after adding 12 months.

   Use the zstaff_master table.
7. Create a copy of the above program(Assign 5). Read the 6th Record of the internal table. Use Index.
8. Create a copy of t he above program(Assign 5). Read the record with staff_name as Allen or address as Mumbai. Use keys.
9. Write a program to accept month number as a parameter. Display the Corresponding Month Name. Use Case EndCase.

Lab 5-1 Create CDS Views

Goals	How to Create CDS Views
Time	4 hours
Lab Setup	• Connectivity to SAP server and HANA Server • Login details for connecting to SAP server and HANA server

1. Create a CDS view to select the following fields from zstaff_master

   Staff_code, Staff_name, design_code, dept_code,staff_sal.

   Preview the data.
2. Write a SE38 program to view the contents of the above view.

   Use the new ABAP syntax.
3. Create a CDS view to select the following fields from zstaff_master and zdept_mas.

   Staff_code, Staff_name, design_code, dept_code,dept_name and staff_sal.

   Preview the data.
4. Write a SE38 program to view the contents of the above view.

   Use the new ABAP syntax.
5. Create a CDS view to select the following fields from zstaff_master and zdept_mas.

   Staff_code, Staff_name, design_code, dept_code,dept_name and staff_sal.

   Use Case End Case as per the below criteria.

   If staff_sal is between 15000 and 25000 then display as 'Low'

   If staff_sal is between 25001 and 45000 then display as 'Medium'

   If staff_sal between 45001 and 65000 then display as 'High

   Preview the data.
6. Write a SE38 program to view the contents of the above view.

   Use the new ABAP syntax.
7. Create a CDS view to view the contents of Zrole1 and Zrole2 tables.

   Use Union and Union all. Preview the data.
8. Refer to the view created in Assigment 1. Create a view on that by joining with the zdep_mas table. View the dept_name field also along with all the fields of the above view. Preview the data.
9. Refer to the view created in Assigment 1. Extend this view by adding the fields STAFF_DOB and HIREDATE. Create another view for doing the above.

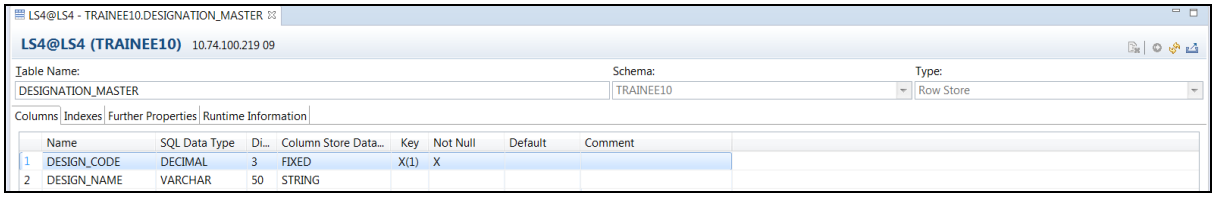
10. Make a copy of the view created in Assignment 1. Modify it to use parameters for staff_code and staff_sal.

Lab 6-1 Create CDS with ALV

Goals	How to Create CDS Views with ALV
Time	4 hours
Lab Setup	• Connectivity to SAP server and HANA Server • Login details for connecting to SAP server and HANA server

Appendix – A – Tables created

The following tables have been created. If the tables are not present, consult your trainer. Do **NOT** create the tables.

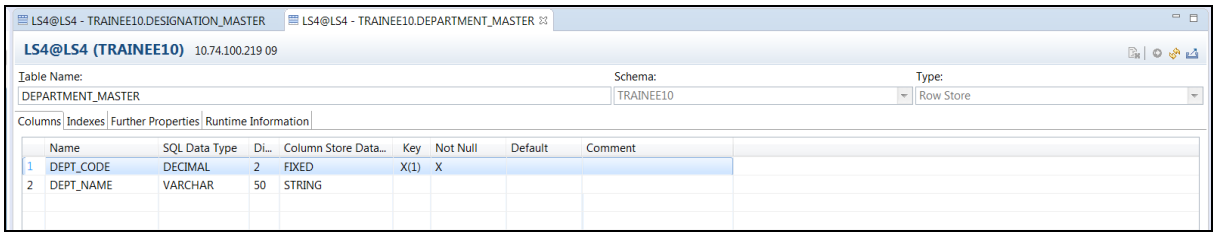

LS4@LS4 - TRAINEE10.DESIGNATION_MASTER

LS4@LS4 (TRAINEE10) 10.74.100.219 09

Table Name: DESIGNATION_MASTER | Schema: TRAINEE10 | Type: Row Store

Columns | Indexes | Further Properties | Runtime Information

	Name	SQL Data Type	Di...	Column Store Data...	Key	Not Null	Default	Comment
1	DESIGN_CODE	DECIMAL	3	FIXED	X(1)	X		
2	DESIGN_NAME	VARCHAR	50	STRING				


LS4@LS4 - TRAINEE10.DESIGNATION_MASTER | LS4@LS4 - TRAINEE10.DEPARTMENT_MASTER

LS4@LS4 (TRAINEE10) 10.74.100.219 09

Table Name: DEPARTMENT_MASTER | Schema: TRAINEE10 | Type: Row Store

Columns | Indexes | Further Properties | Runtime Information

	Name	SQL Data Type	Di...	Column Store Data...	Key	Not Null	Default	Comment
1	DEPT_CODE	DECIMAL	2	FIXED	X(1)	X		
2	DEPT_NAME	VARCHAR	50	STRING				

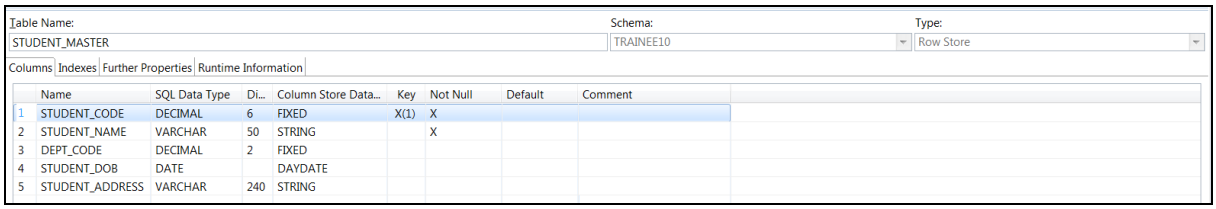


Table Name: STUDENT_MASTER | Schema: TRAINEE10 | Type: Row Store

Columns | Indexes | Further Properties | Runtime Information

	Name	SQL Data Type	Di...	Column Store Data...	Key	Not Null	Default	Comment
1	STUDENT_CODE	DECIMAL	6	FIXED	X(1)	X		
2	STUDENT_NAME	VARCHAR	50	STRING		X		
3	DEPT_CODE	DECIMAL	2	FIXED				
4	STUDENT_DOB	DATE		DAYDATE				
5	STUDENT_ADDRESS	VARCHAR	240	STRING				

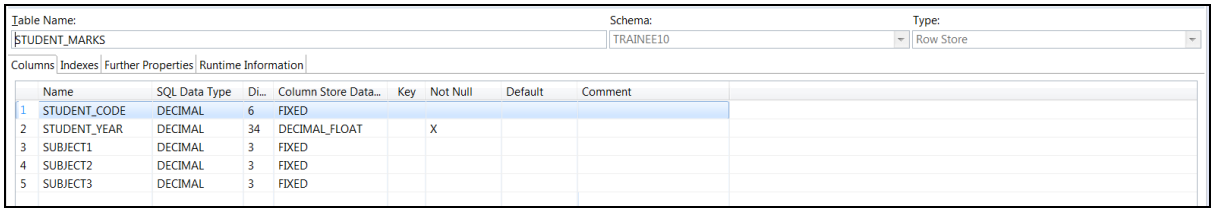


Table Name: STUDENT_MARKS | Schema: TRAINEE10 | Type: Row Store

Columns | Indexes | Further Properties | Runtime Information

	Name	SQL Data Type	Di...	Column Store Data...	Key	Not Null	Default	Comment
1	STUDENT_CODE	DECIMAL	6	FIXED				
2	STUDENT_YEAR	DECIMAL	34	DECIMAL_FLOAT		X		
3	SUBJECT1	DECIMAL	3	FIXED				
4	SUBJECT2	DECIMAL	3	FIXED				
5	SUBJECT3	DECIMAL	3	FIXED				

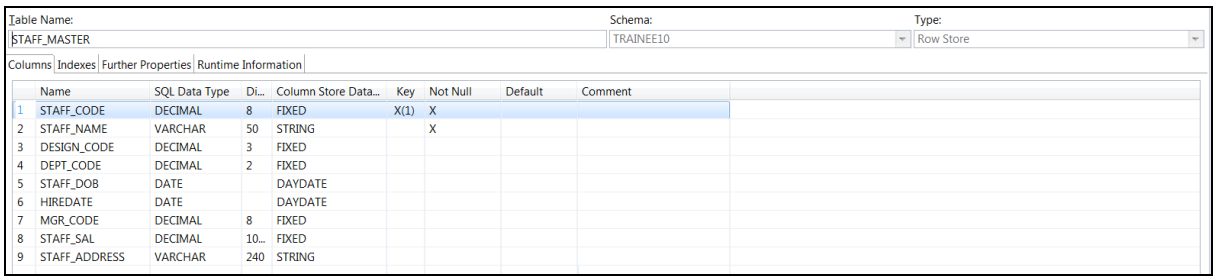
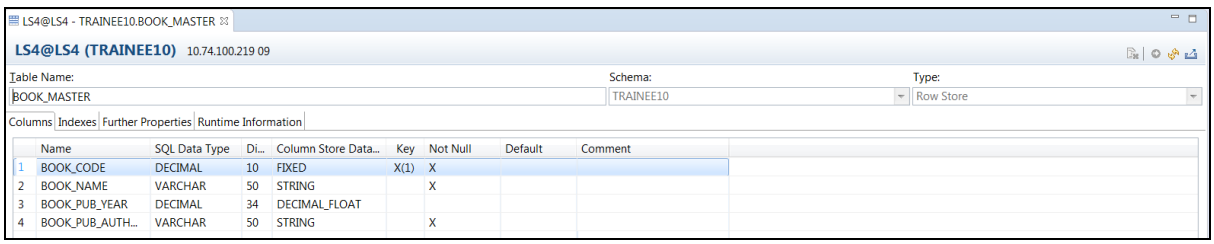


Table Name: STAFF_MASTER | Schema: TRAINEE10 | Type: Row Store

Columns | Indexes | Further Properties | Runtime Information

	Name	SQL Data Type	Di...	Column Store Data...	Key	Not Null	Default	Comment
1	STAFF_CODE	DECIMAL	8	FIXED	X(1)	X		
2	STAFF_NAME	VARCHAR	50	STRING		X		
3	DESIGN_CODE	DECIMAL	3	FIXED				
4	DEPT_CODE	DECIMAL	2	FIXED				
5	STAFF_DOB	DATE		DAYDATE				
6	HIREDATE	DATE		DAYDATE				
7	MGR_CODE	DECIMAL	8	FIXED				
8	STAFF_SAL	DECIMAL	10...	FIXED				
9	STAFF_ADDRESS	VARCHAR	240	STRING				


LS4@LS4 - TRAINEE10.BOOK_MASTER

LS4@LS4 (TRAINEE10) 10.74.100.219 09

Table Name: BOOK_MASTER | Schema: TRAINEE10 | Type: Row Store

Columns | Indexes | Further Properties | Runtime Information

	Name	SQL Data Type	Di...	Column Store Data...	Key	Not Null	Default	Comment
1	BOOK_CODE	DECIMAL	10	FIXED	X(1)	X		
2	BOOK_NAME	VARCHAR	50	STRING		X		
3	BOOK_PUB_YEAR	DECIMAL	34	DECIMAL_FLOAT				
4	BOOK_PUB_AUTH...	VARCHAR	50	STRING		X		

LS4@LS4 - TRAINEE10.BOOK_MASTER | LS4@LS4 - TRAINEE10.BOOK_TRANSACTIONS

LS4@LS4 (TRAINEE10) 10.74.100.219 09

Table Name: BOOK_TRANSACTIONS | Schema: TRAINEE10 | Type: Row Store

Columns | Indexes | Further Properties | Runtime Information

	Name	SQL Data Type	Dimension	Column Store Data...	Key	Not Null	Default	Comment
1	BOOK_CODE	DECIMAL	10	FIXED				
2	STUDENT_CODE	DECIMAL	6	FIXED				
3	STAFF_CODE	DECIMAL	8	FIXED				
4	BOOK_ISSUE_DATE	DATE		DAYDATE		X		
5	BOOK_EXPECTED_RETURN_DATE	DATE		DAYDATE		X		
6	BOOK_ACTUAL_RETURN_DATE	DATE		DAYDATE				

LS4@LS4 (TRAINEE10) 10.74.100.219 09

Table Name: ZROLE1 | Schema: SAPLS4 | Type: Column Store

Columns | Indexes | Further Properties | Runtime Information

	Name	SQL Data Type	Di...	Column Store Data...	Key	Not Null	Default	Comment
1	EMPNO	NVARCHAR	1	STRING	X(1)	X	0	
2	ROLE	NVARCHAR	2	STRING		X		

LS4@LS4 - SAPLS4.ZROLE2

LS4@LS4 (TRAINEE10) 10.74.100.219 09

Table Name: ZROLE2 | Schema: SAPLS4 | Type: Column Store

Columns | Indexes | Further Properties | Runtime Information

	Name	SQL Data Type	Di...	Column Store Data...	Key	Not Null	Default	Comment
1	EMPNO	NVARCHAR	1	STRING	X(1)	X	0	
2	ROLE	NVARCHAR	2	STRING		X		

LS4@LS4 - TRAINEE10.DESIGNATION_MASTER | "TRAINEE10"."DESIGNATION_MASTER"

Raw Data | Distinct values | Analysis

Filter patte... **6 rows retrieved - 32 ms**

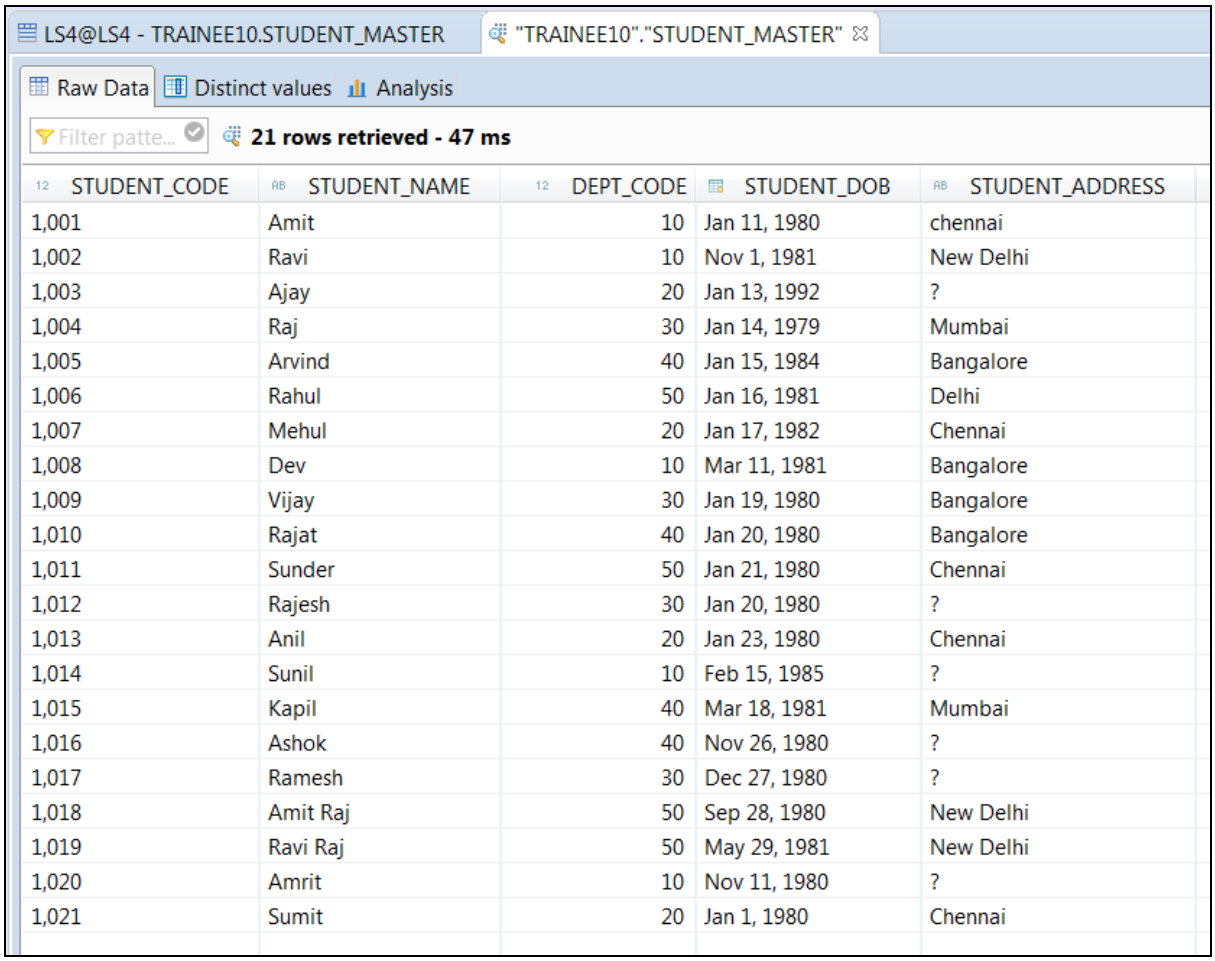
12 DESIGN_CODE	AB DESIGN_NAME
101	HOD
102	Professor
103	Reader
104	Sr.Lecturer
105	Lecturer
106	Director

LS4@LS4 - TRAINEE10.DEPARTMENT_MASTER | "TRAINEE10"."DEPARTMENT_MASTER"

Raw Data | Distinct values | Analysis

Filter patte... **5 rows retrieved - 47 ms**

12 DEPT_CODE	AB DEPT_NAME
10	Computer Science
20	Electricals
30	Electronics
40	Mechanics
50	Robotics



LS4@LS4 - TRAINEE10.STUDENT_MASTER | "TRAINEE10"."STUDENT_MASTER"

Raw Data | Distinct values | Analysis

Filter patte... | 21 rows retrieved - 47 ms

STUDENT_CODE	STUDENT_NAME	DEPT_CODE	STUDENT_DOB	STUDENT_ADDRESS
1,001	Amit	10	Jan 11, 1980	chennai
1,002	Ravi	10	Nov 1, 1981	New Delhi
1,003	Ajay	20	Jan 13, 1992	?
1,004	Raj	30	Jan 14, 1979	Mumbai
1,005	Arvind	40	Jan 15, 1984	Bangalore
1,006	Rahul	50	Jan 16, 1981	Delhi
1,007	Mehul	20	Jan 17, 1982	Chennai
1,008	Dev	10	Mar 11, 1981	Bangalore
1,009	Vijay	30	Jan 19, 1980	Bangalore
1,010	Rajat	40	Jan 20, 1980	Bangalore
1,011	Sunder	50	Jan 21, 1980	Chennai
1,012	Rajesh	30	Jan 20, 1980	?
1,013	Anil	20	Jan 23, 1980	Chennai
1,014	Sunil	10	Feb 15, 1985	?
1,015	Kapil	40	Mar 18, 1981	Mumbai
1,016	Ashok	40	Nov 26, 1980	?
1,017	Ramesh	30	Dec 27, 1980	?
1,018	Amit Raj	50	Sep 28, 1980	New Delhi
1,019	Ravi Raj	50	May 29, 1981	New Delhi
1,020	Amrit	10	Nov 11, 1980	?
1,021	Sumit	20	Jan 1, 1980	Chennai

LS4@LS4 - TRAINEE10.STUDENT_MARKS | "TRAINEE10"."STUDENT_MARKS"

Raw Data | Distinct values | Analysis

Filter patte... **42 rows retrieved - 63 ms**

STUDENT_CODE	STUDENT_YEAR	SUBJECT1	SUBJECT2	SUBJECT3
1,001	2,010	55	45	78
1,002	2,010	66	74	88
1,003	2,010	87	54	65
1,004	2,010	65	64	90
1,005	2,010	78	88	65
1,006	2,010	65	86	54
1,007	2,010	67	79	49
1,008	2,010	72	55	55
1,009	2,010	71	59	58
1,010	2,010	68	44	92
1,011	2,010	89	96	78
1,012	2,010	78	56	55
1,013	2,010	75	58	65
1,014	2,010	73	74	65
1,015	2,010	66	45	74
1,016	2,010	68	78	74
1,017	2,010	69	44	52
1,018	2,010	65	78	56
1,019	2,010	78	58	74
1,020	2,010	45	55	65
1,021	2,010	78	79	78
1,001	2,011	68	44	92
1,002	2,011	89	96	78
1,003	2,011	78	56	55
1,004	2,011	75	58	65
1,005	2,011	73	74	65
1,006	2,011	66	45	74
1,007	2,011	68	78	74
1,008	2,011	69	44	52
1,009	2,011	65	78	56
1,010	2,011	78	58	74
1,011	2,011	45	55	65

LS4@LS4 - TRAINEE10.STUDENT_MARKS | "TRAINEE10"."STUDENT_MARKS"

Raw Data | Distinct values | Analysis

Filter patte... **42 rows retrieved - 63 ms**

STUDENT_CODE	STUDENT_YEAR	SUBJECT1	SUBJECT2	SUBJECT3
1,012	2,010	78	56	55
1,013	2,010	75	58	65
1,014	2,010	73	74	65
1,015	2,010	66	45	74
1,016	2,010	68	78	74
1,017	2,010	69	44	52
1,018	2,010	65	78	56
1,019	2,010	78	58	74
1,020	2,010	45	55	65
1,021	2,010	78	79	78
1,001	2,011	68	44	92
1,002	2,011	89	96	78
1,003	2,011	78	56	55
1,004	2,011	75	58	65
1,005	2,011	73	74	65
1,006	2,011	66	45	74
1,007	2,011	68	78	74
1,008	2,011	69	44	52
1,009	2,011	65	78	56
1,010	2,011	78	58	74
1,011	2,011	45	55	65
1,012	2,011	78	79	78
1,013	2,011	66	74	88
1,014	2,011	65	64	90
1,015	2,011	78	88	65
1,016	2,011	65	86	54
1,017	2,011	67	79	49
1,018	2,011	72	55	55
1,019	2,011	71	59	58
1,020	2,011	55	45	78
1,021	2,011	87	54	65

LS4@LS4 - TRAINEE10.STAFF_MASTER "TRAINEE10"."STAFF_MASTER"

Raw Data | Distinct values | Analysis

Filter patte... **10 rows retrieved - 62 ms** Execute

STAFF_CODE	STAFF_NAME	DESIGN_CODE	DEPT_CODE	STAFF_DOB	HIREDATE	MGR_CODE	STAFF_SAL	STAFF_ADDRESS
100,001	Arvind	102	30	Jan 15, 1980	Jan 15, 2003	100,006	17,000	Bangalore
100,002	Shyam	102	20	Feb 18, 1980	Feb 17, 2002	100,007	20,000	Chennai
100,003	Mohan	102	10	Mar 23, 1980	Jan 19, 2002	100,006	24,000	Mumbai
100,004	Anil	102	20	Apr 22, 1977	Mar 11, 2001	100,006	20,000	Hyderabad
100,005	John	106	10	May 22, 1976	Jan 21, 2001	100,007	32,000	Bangalore
100,006	Allen	103	30	Jan 22, 1980	Apr 23, 2001	100,005	42,000	Chennai
100,007	Smith	103	20	Jul 19, 1973	Mar 12, 2002	100,005	62,000	Mumbai
100,008	Raviraj	102	40	Jun 17, 1980	Jan 11, 2003	100,006	18,000	Bangalore
100,009	Rahul	102	20	Jan 16, 1978	Dec 11, 2003	100,006	22,000	Hyderabad
100,010	Ram	103	30	Jan 17, 1979	Jan 17, 2002	100,007	32,000	Bangalore

LS4@LS4 - TRAINEE10.BOOK_MASTER "TRAINEE10"."BOOK_MASTER"

Raw Data | Distinct values | Analysis

Filter patte... **9 rows retrieved - 47 ms**

BOOK_CODE	BOOK_NAME	BOOK_PUB_YEAR	BOOK_PUB_AUTHOR
10,000,001	Let Us C++	2,000	Yashavant Kanetkar
10,000,002	Mastersing VC++	2,005	P.J Allen
10,000,003	JAVA Complete Reference	2,004	H.Schild
10,000,004	J2EE Complete Reference	2,000	H. Schild
10,000,005	Relational DBMS	2,000	B.C. Desai
10,000,006	Let Us C	2,000	Yashavant Kanetkar
10,000,007	Intoduction To Algorithams	2,001	Cormen
10,000,008	Computer Networks	2,000	Tanenbaum
10,000,009	Introduction to O/S	2,001	Millan

LS4@LS4 - TRAINEE10.BOOK_TRANSACTIONS "TRAINEE10"."BOOK_TRANSACTIONS"

Raw Data | Distinct values | Analysis

Filter patte... **8 rows retrieved - 32 ms**

BOOK_CODE	STUDENT_CODE	STAFF_CODE	BOOK_ISSUE_DATE	BOOK_EXPECTED_RETURN_DATE	BOOK_ACTUAL_RETURN_DATE
10,000,006	1,012	?	Feb 2, 2011	Feb 9, 2011	?
10,000,008	?	100,006	Mar 10, 2011	Mar 17, 2011	Mar 15, 2011
10,000,009	?	100,010	Mar 1, 2011	Mar 8, 2011	Mar 10, 2011
10,000,004	1,015	?	Feb 12, 2011	Feb 19, 2011	?
10,000,005	?	100,007	Mar 14, 2011	Mar 21, 2011	Mar 21, 2011
10,000,007	?	100,007	Apr 1, 2011	Apr 7, 2011	Apr 6, 2011
10,000,007	?	100,006	Mar 1, 2010	Apr 7, 2010	Apr 6, 2011
10,000,005	1,009	?	May 31, 2011	Jun 8, 2011	Jun 8, 2011

Note: ? Indicates No value for that field.