

## **מעבדת תרומת דם**

מגישות:

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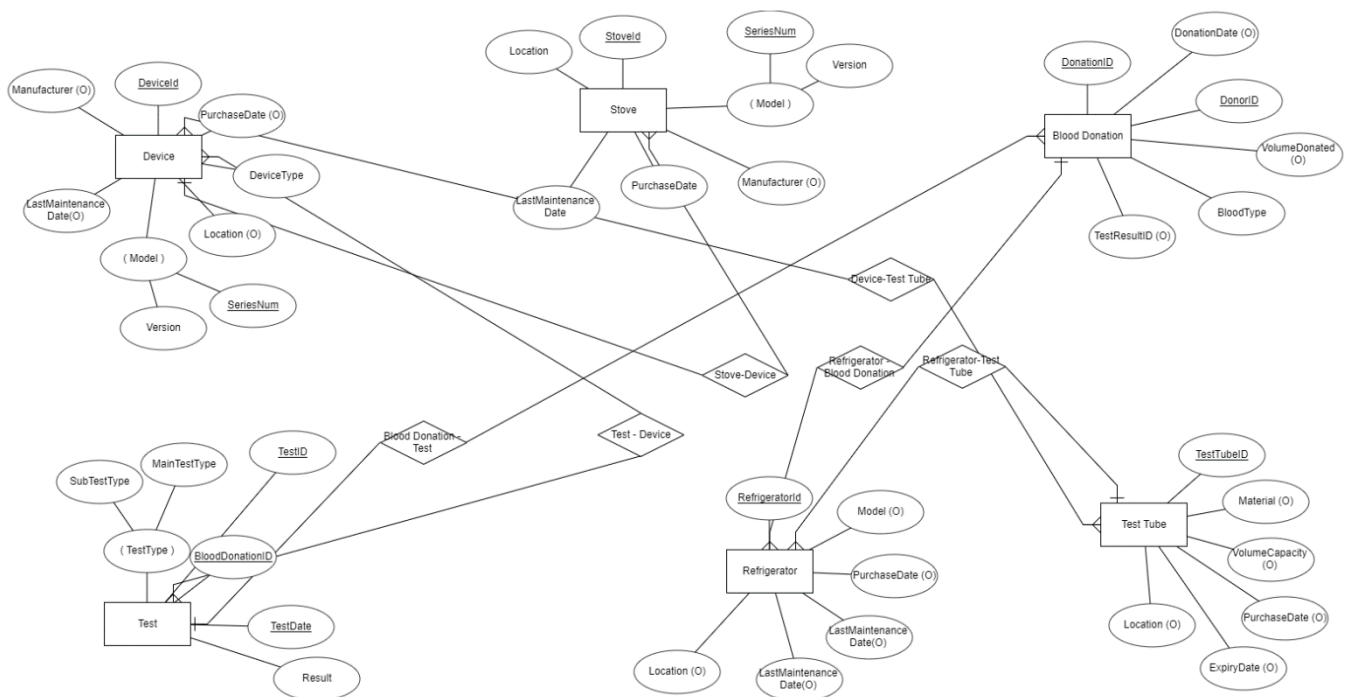
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## **תיאור מילולי:**

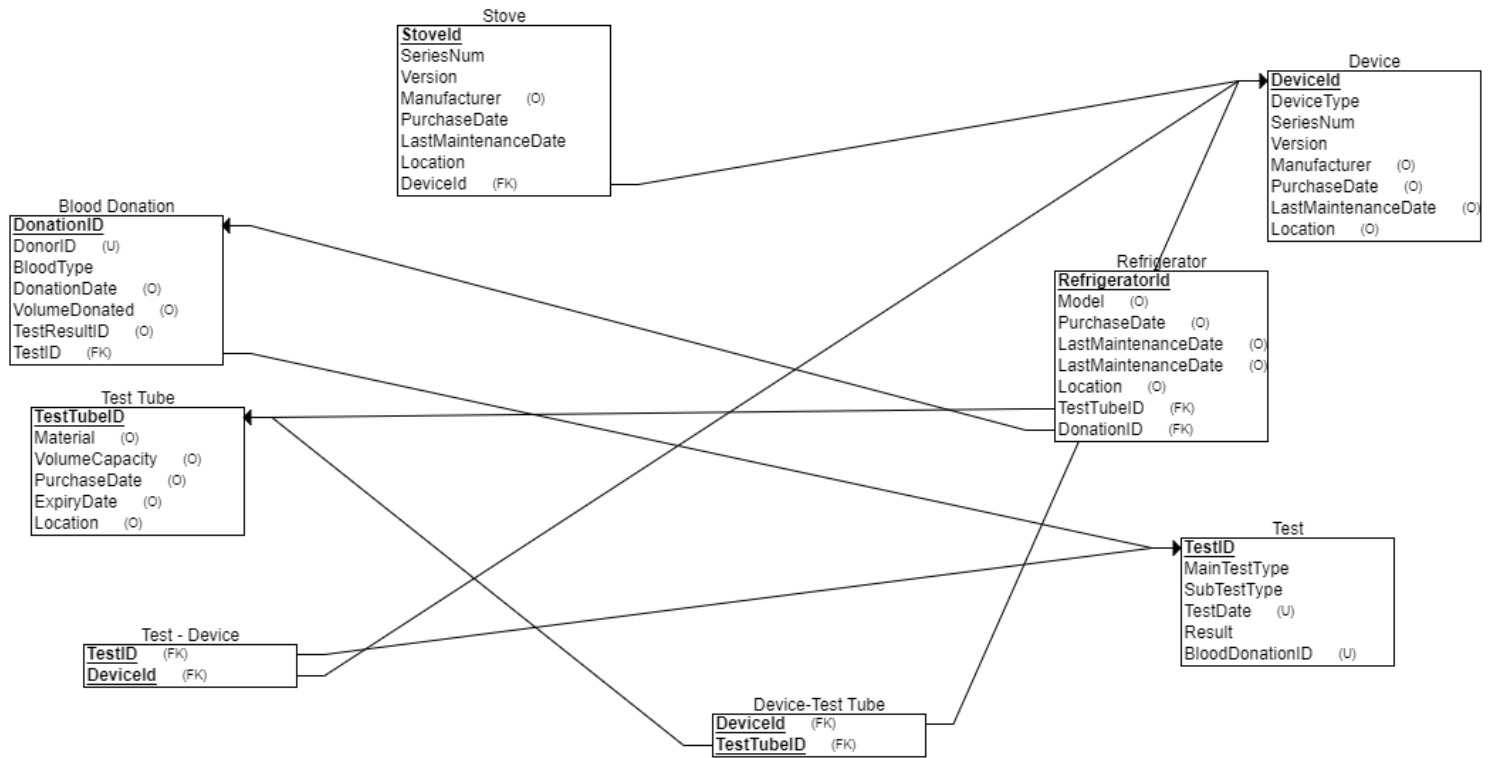
**שם המערכת:** מעבדת תרומות דם.

**תיאור המערכת:** המערכת היא מערכת לניהול מידע על מכשירים, בדיקות רפואיות, תרומות דם וציוד רפואי. הנתונים המרכזיים במערכת כוללים מידע על מכשירים רפואיים (כמו מספר סידורי, סוג, יצרן ותאריכי רכישה ותחזוקה אחרונה), בדיקות רפואיות (כולל סוג בדיקה, תאריך ותוצאות), תרומות דם (כולל סוג דם, תאריך התרומה וכמות דם) וציוד רפואי נלווה (כולל תאריכי רכישה ותחזוקה, דגם ומיקום). המערכת מטרתה לאפשר ניהול יעיל ומדויק של כלל המידע הרלוונטי, כולל הקשרים בין הנתונים, לצורך תמיכה בתהליכי רפואיים, ניהול מלאי וציוד, וניטור וניהול תרומות דם.

## ERD של המערכת:



## DSD של המערכת



## CreateTable

```
CREATE TABLE Device1
(
    DeviceId varchar2(50) NOT NULL,
    DeviceType INT NOT NULL,
    SeriesNum INT NOT NULL,
    VersionD INT NOT NULL,
    Manufacturer varchar2(50),
    PurchaseDate DATE,
    LastMaintenanceDate DATE,
    LocationD varchar2(50),
    PRIMARY KEY (DeviceId)
);
```

```
CREATE TABLE Test_Tube1—
(
    TestTubeID varchar2(50) NOT NULL,
    Material INT,
    VolumeCapacity INT,
    PurchaseDate DATE,
    ExpiryDate DATE,
    LocationTestTube varchar2(50),
    PRIMARY KEY (TestTubeID)
);
```

```
CREATE TABLE Test_1—
(
    TestID varchar2(50) NOT NULL,
```

```

MainTestType INT NOT NULL,
SubTestType INT NOT NULL,
TestDate DATE NOT NULL,
ResultT varchar2(50) NOT NULL,
BloodDonationID varchar2(50) NOT NULL,
PRIMARY KEY (TestID),
UNIQUE (TestDate),
UNIQUE (BloodDonationID)
);

```

```

CREATE TABLE Test_Device1—
(
TestID varchar2(50) NOT NULL,
DeviceId varchar2(50) NOT NULL,
PRIMARY KEY (TestID, DeviceId),
FOREIGN KEY (TestID) REFERENCES Test_1(TestID),
FOREIGN KEY (DeviceId) REFERENCES Device1(DeviceId)) ;

```

```

CREATE TABLE DeviceTest_Tube1—
(
DeviceId varchar2(50) NOT NULL,
TestTubeID varchar2(50) NOT NULL,
PRIMARY KEY (DeviceId, TestTubeID),
FOREIGN KEY (DeviceId) REFERENCES Device1(DeviceId),
FOREIGN KEY (TestTubeID) REFERENCES Test_Tube1(TestTubeID)
);

```

```

CREATE TABLE Blood_Donation1

```

```
(
    DonationID varchar2(50) NOT NULL,
    DonorID varchar2(50) NOT NULL,
    BloodType varchar2(50) NOT NULL,
    DonationDate DATE,
    VolumeDonated INT,
    TestResultID varchar2(50),
    TestID varchar2(50) NOT NULL,
    PRIMARY KEY (DonationID),
    FOREIGN KEY (TestID) REFERENCES Test_1(TestID),
    UNIQUE (DonorID)
);
```

CREATE TABLE Stove1—

```
(
    StoveId varchar2(50) NOT NULL,
    SeriesNum INT NOT NULL,
    VersionStove INT NOT NULL,
    Manufacturer INT,
    PurchaseDate DATE NOT NULL,
    LastMaintenanceDate DATE NOT NULL,
    LocationStove varchar2(50) NOT NULL,
    DeviceId varchar2(50) NOT NULL,
    PRIMARY KEY (StoveId),
    FOREIGN KEY (DeviceId) REFERENCES Device1(DeviceId)
);
```

CREATE TABLE Refrigerator1—



```
(  
    RefrigeratorId varchar2(50) NOT NULL,  
    ModelR INT,  
    PurchaseDate DATE,  
    LastMaintenanceDate DATE,  
    LocationR varchar2(50),  
    TestTubeID varchar2(50) NOT NULL,  
    DonationID varchar2(50) NOT NULL,  
    PRIMARY KEY (RefrigeratorId),  
    FOREIGN KEY (TestTubeID) REFERENCES Test_Tube1(TestTubeID),  
    FOREIGN KEY (DonationID) REFERENCES Blood_Donation1(DonationID)  
);
```

## **DropTable**

```
;DROP TABLE Refrigerator1  
;DROP TABLE Stove1  
;DROP TABLE Blood_Donation1  
;DROP TABLE DeviceTest_Tube1  
;DROP TABLE Test_Device1  
;DROP TABLE Test_1  
;DROP TABLE Test_Tube1  
;DROP TABLE Device1
```

## Insert

זה כמות אדירה ולכן נרשום רק כמה שורות...

```
INSERT INTO Device1 (DeviceId, DeviceType, SeriesNum, VersionD,  
Manufacturer, PurchaseDate, LastMaintenanceDate, LocationD) VALUES  
('YvSGkO6l6fRwXlaf5But', 31, 760, 9, 'PvsL2vp1kgjRPSYTZaTE', TO_DATE('2003-  
09-16', 'YYYY-MM-DD'), TO_DATE('2010-04-13', 'YYYY-MM-DD'),  
'evql5CvnJlWT5sjpFOr8');
```

```
INSERT INTO Device1 (DeviceId, DeviceType, SeriesNum, VersionD,  
Manufacturer, PurchaseDate, LastMaintenanceDate, LocationD) VALUES  
('eR4LgsUjk1PKOmGQkmDp', 46, 436, 2, 'WiFxVJLbwrlcYzZdpL5G',  
TO_DATE('2010-04-04', 'YYYY-MM-DD'), TO_DATE('2010-09-25', 'YYYY-MM-DD'),  
'mFjXIEDHUPMHZDlvApsT');
```

```
INSERT INTO Device1 (DeviceId, DeviceType, SeriesNum, VersionD,  
Manufacturer, PurchaseDate, LastMaintenanceDate, LocationD) VALUES  
('3h5ggjXUeEB2Gr8WzzWa', 73, 748, 9, 'sApvxdDVio2a9G4AMJ3C',  
TO_DATE('2020-03-12', 'YYYY-MM-DD'), TO_DATE('2000-04-20', 'YYYY-MM-DD'),  
'r964gYNL8H8739jrYgrf');
```

### SelectAll

SELECT\* from Device1;

SELECT\* from Test\_Tube1;

SELECT\* from Test\_1;

SELECT\* from Test\_Device1;

SELECT\* from DeviceTest\_Tube1;

SELECT\* from Blood\_Donation1;

SELECT\* from Stove1;

SELECT\* from Refrigerator1;

## Desc

```
VOLUMEDONATED INTEGER Y  
TESTRESULTID VARCHAR2 (50) Y  
TESTID VARCHAR2 (50)
```

SQL> desc Stove1

Name	Type	Nullable	Default	Comments
STOVEID	VARCHAR2 (50)			
SERIESNUM	INTEGER			
VERSIONSTOVE	INTEGER			
MANUFACTURER	INTEGER	Y		
PURCHASEDATE	DATE			
LASTMAINTENANCEDATE	DATE			
LOCATIONSTOVE	VARCHAR2 (50)			
DEVICEID	VARCHAR2 (50)			

SQL> desc Refrigerator1

Name	Type	Nullable	Default	Comments
REFRIGERATORID	VARCHAR2 (50)			
MODELNR	INTEGER	Y		
PURCHASEDATE	DATE	Y		
LASTMAINTENANCEDATE	DATE	Y		
LOCATIONNR	VARCHAR2 (50)	Y		
TESTTUBEID	VARCHAR2 (50)			
DONATIONID	VARCHAR2 (50)			

SQL> |

SQL> desc Test\_Device1

Name	Type	Nullable	Default	Comments
TESTID	VARCHAR2 (50)			
DEVICEID	VARCHAR2 (50)			

SQL> desc DeviceTest\_Tube1

Name	Type	Nullable	Default	Comments
DEVICEID	VARCHAR2 (50)			
TESTTUBEID	VARCHAR2 (50)			

SQL> desc Blood\_Donation1

Name	Type	Nullable	Default	Comments
DONATIONID	VARCHAR2 (50)			
DONORID	VARCHAR2 (50)			
BLOODTYPE	VARCHAR2 (50)			
DONATIONDATE	DATE	Y		
VOLUMEDONATED	INTEGER	Y		
TESTRESULTID	VARCHAR2 (50)	Y		
TESTID	VARCHAR2 (50)			

SQL> desc Stove1

Name	Type	Nullable	Default	Comments
STOVEID	VARCHAR2 (50)			
SERIESNUM	INTEGER			
VERSIONSTOVE	INTEGER			
MANUFACTURER	INTEGER	Y		

```

SQL> desc device1
Name          Type          Nullable Default Comments
-----
DEVICEID      VARCHAR2 (50)
DEVICETYPE    INTEGER
SERIESNUM     INTEGER
VERSIOND      INTEGER
MANUFACTURER  VARCHAR2 (50) Y
PURCHASEDATE  DATE          Y
LASTMAINTENANCEDATE DATE        Y
LOCATIOND       VARCHAR2 (50) Y

SQL> desc Test_Tube1
Name          Type          Nullable Default Comments
-----
TESTTUBEID    VARCHAR2 (50)
MATERIAL      INTEGER       Y
VOLUMECAPACITY INTEGER       Y
PURCHASEDATE  DATE          Y
EXPIRYDATE    DATE          Y
LOCATIONTESTTUBE VARCHAR2 (50) Y

SQL> desc Test_1
Name          Type          Nullable Default Comments
-----
TESTID        VARCHAR2 (50)
MAINTESTTYPE  INTEGER
SUBTESTTYPE   INTEGER
TESTDATE      DATE

```

## Data Generators

\*על ידי תוכנית ב C++

```









1 #include <iostream>
2 #include <string>
3 #include <vector>
4 #include <ctime>
5 #include <cstdlib>
6 #include <unordered_map>
7
8 using namespace std;
9
10 // Function to generate a random string of given length
11 string generateRandomString(int length) {
12     string chars = "ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789";
13     string result = "";
14     for (int i = 0; i < length; i++) {
15         result += chars[rand() % chars.length()];
16     }
17     return result;
18 }
19
20 // Function to generate a random date within a specific range
21 string generateRandomDate(int startYear, int endYear) {
22     int year = rand() % (endYear - startYear + 1) + startYear;
23     int month = rand() % 12 + 1;
24     int day = rand() % 28 + 1; // To avoid issues with varying month lengths
25     char date[11];
26     sprintf(date, "%04d-%02d-%02d", year, month, day);
27     return string(date);
28 }
29
30 int main() {
31     int length = 10;
32     int startYear = 2000, endYear = 2023;
33     string randomString = generateRandomString(length);
34     string randomDate = generateRandomDate(startYear, endYear);
35     cout << "Random String: " << randomString << endl;
36     cout << "Random Date: " << randomDate << endl;
37     return 0;
38 }

```

\*על ידי קצבי exel

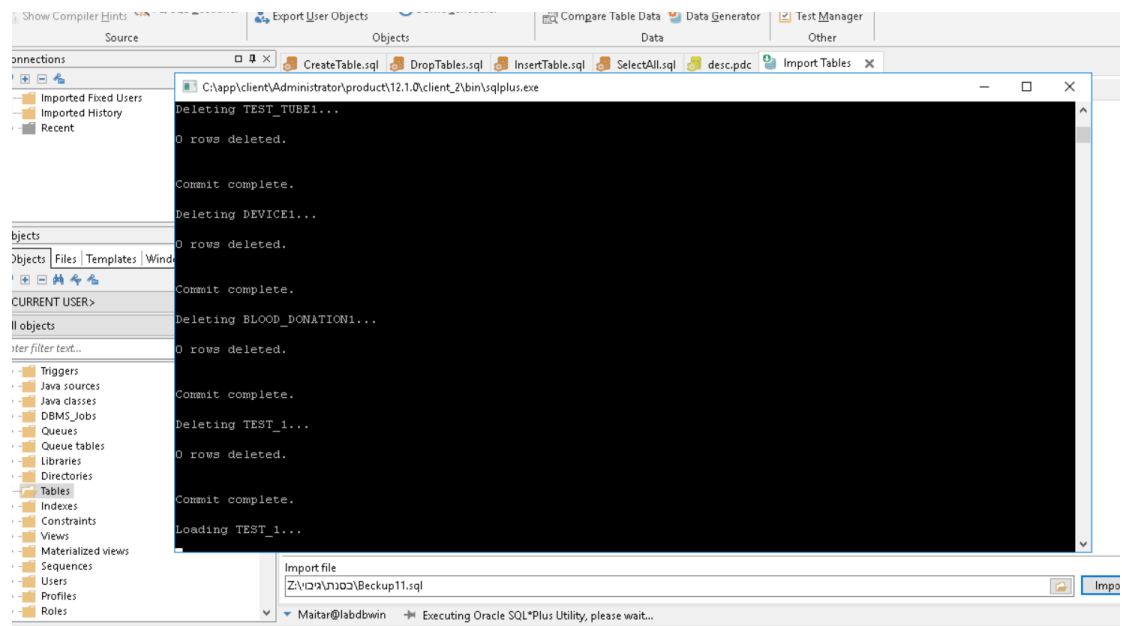
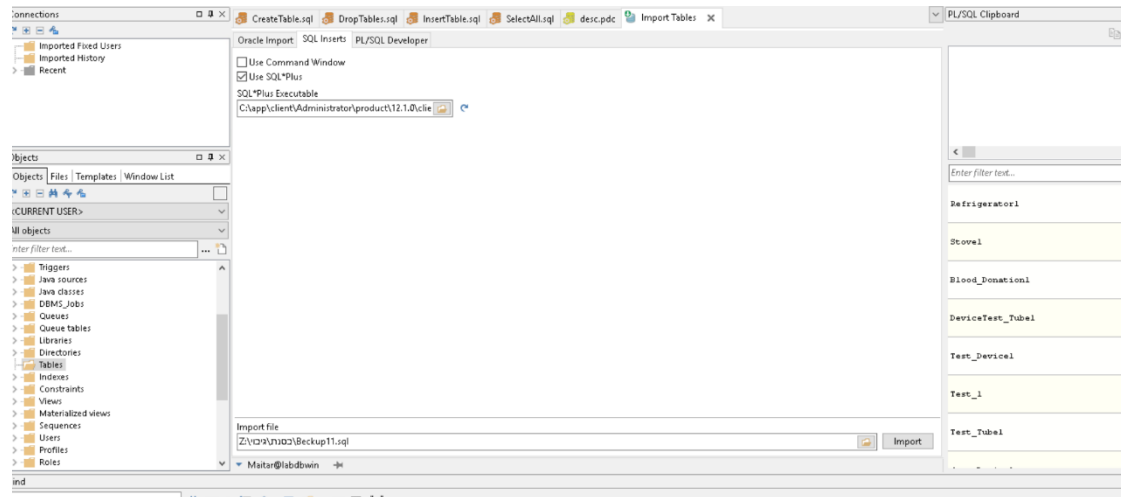
	A	B	C	D	E	F	G	H
1	StoveId	SeriesNum	VersionStov	Manufacture	PurchaseDa	LastMainter	LocationSto	DeviceId
2	OJ8Wfwytgs	174	6	u61GURC3Q	18/05/2012	13/08/2011	BoPRzd0Wq	3JwlU9dGEK
3	PhjEe2RBjeZ	558	4	DrP9PLdrDE	11/03/2000	26/02/2017	VutQ1URAbg	GJuUmCFHC
4	ucv1cbpZpG	450	6	ixWGvNwzjV	09/08/2021	30/05/2008	JLVnsJ16iwT	VeaALT3zZXY
5	OtW1RvJk2c	232	1	csnDyAO7cT	20/05/2014	18/03/2022	OGHZcYN8ey	c2S8bsiiL3b
6	qmbzvsh75	619	6	bNMtNT0Hb	18/01/2009	30/11/2011	dVLRZGP62l	aG8voTCFXY
7	Eh2froCblfP	467	8	AdEhesNB2f	15/12/2008	17/12/2018	egFJsZF4KM	oXmV4VXME
8	geg5hj1XtJQ	785	2	ohntDbjHMc	04/01/2015	03/11/2002	yvs03aKBXv	pOmuSefulv
9	cAmrtwNx9l	348	10	QtMFaAOaQ	20/10/2016	02/06/2004	43a7gSo2YO	6TZmHHpk2
10	xP7xvGst9Jz	964	8	xPEVVB4M6	14/02/2017	30/06/2021	m8akuXm3u	TDrY6r5Ed1S
11	PqhxYb34y	70	7	7rcgEJWFDX	18/10/2021	22/07/2005	dNOxhXQWJ	VvQmJJqAG
12	loWYjCPkxzc	599	4	xPEVVB4M6	07/07/2017	06/07/2001	kPJ6wn5HhE	iEvYsrJUPTxe
13	EB9ezF823d	79	2	mXOT9piWC	11/12/2009	08/11/2022	FxlaHG0114	6TZmHHpk2
14	fep9TtSfwdj	660	4	x2PuvzbtSyC	24/02/2002	06/04/2005	59dlwta97K	VvQmJJqAG
15	6ro8MKCON	309	3	RoTCaXQL8E	08/07/2019	07/07/2022	dcCBE3VjI7n	zVz4eeNfme
16	UKHpG0XGv	604	7	CZtZyasZln6	23/09/2011	04/07/2017	n4qlODAzP6	Dt7CfR1315C
17	UdOKkkAQeI	99	2	u61GURC3Q	02/08/2021	31/10/2015	IreuSnbbyNk	Q9AlgKi2VQI
18	gecyR2hzohc	371	7	h6Qa6DmKc	06/06/2001	03/06/2017	UJdUtdHC16	gcZRRWdAL8
19	6I7Ov4qMr7	437	7	zZ7AzXqFit3	18/08/2023	19/02/2003	rtJWWFXq3	UpHsnKtDiV
20	FbKBuDvdM	310	8	RVi0pauvdW	18/06/2016	09/06/2005	zraIB27hQn	MHRvIrODdE
21	pLBOWESXQ	310	2	CZtZyasZln6	23/07/2020	29/03/2015	Zot8YWkgxc	YFvzR6EXWS
22	ten6PvTviRV	304	6	NxpUebcl3gC	02/12/2012	18/08/2007	BcwsWb2Lw	eneDROYPYF
23	YCPYnvqT1F	894	9	rbCuTVjFSU5	07/01/2005	21/07/2013	JclUslbia4og	X7PapIqOITh
24	lBOHfxfnSfgM	59	3	Y8f1XoK7d8	04/03/2014	13/12/2023	xG4dvyyiqR5	cD7b4H2mT
25	HPojJsJF6tVl	433	6	NxpUebcl3gC	10/07/2005	22/02/2018	sRXlLJKockR	BYsYqbbqkNlJ

## על ידי Data Generaor\*

Name	Date modified	Type	Size
 DataGeneratorBloodDonation.gd	25/05/2024 21:48	GD File	1 KB
 DataGeneratorDevice_Test_Tube1.gd	25/05/2024 21:37	GD File	1 KB
 DataGeneratorDevice1.gd	25/05/2024 21:37	GD File	1 KB
 DataGeneratorRefrigerator1.gd	25/05/2024 21:48	GD File	1 KB
 DataGeneratorStove1.gd	25/05/2024 21:44	GD File	1 KB
 DataGeneratorTest_Device1.gd	25/05/2024 21:48	GD File	1 KB
 dataGeneratorTest_Tube1.gd	25/05/2024 21:37	GD File	1 KB
 DataGeneratorTest1.gd	25/05/2024 21:48	GD File	1 KB



## גיבוי



Source Objects Data Other

Connections CreateTable.sql DropTables.sql InsertTable.sql SelectAll.sql desc.pdc Import Tables Edit data STOVE1@LABDBWIN PL/SQL Clipboard

SQL Output Statistics

```
select t.*, t.rowid from STOVE1 t
```

Objects Files Templates Window List

<CURRENT USER>

All objects

Enter filter text...

DBMS\_Jobs

Queues

Queue tables

Libraries

Directories

Tables

BLOOD\_DONATION1

DEVICE1

DEVICETEST\_TUBE1

REFRIGERATOR1

STOVE1

TEST\_1

TEST\_DEVICE1

TEST\_TUBE1

Indexes

Constraints

Views

STOVEID	SERIESNUM	VERSIONSTOVE	MANUFACTURER	PURCHASEDATE	LASTMAINTENANCE
1	1	25	8	08/07/2019	27/04/2013
2	dkq829bM475ih275oNh09nQb149hKT716Mo63N1579aS	771	29	144 13/10/2208 17:50:21	10/11/2028 08:
3	wMD693dkV856bHf72aAe575R25vMC781tT500eR0681fN	795	50	1459 13/01/2524 15:54:17	11/03/2303 16:
4	YD773cAw787eOy719hG868gWB897bPA976kQc571nOG55yL	1170	97	578 11/02/2100 19:43:23	17/10/2396 12:
5	nKL628Cn816aGP799bRL287gY0270yXk669kZV758aJb989pO	964	23	840 16/07/2793 03:49:23	23/01/2580 22:
6	hNb4465q166cf315xU072ILq796uA86yQg686IG01lvZ	533	63	141 06/11/2494 07:04:48	28/05/2571 00:
7	gQw888MB522vE915ySw395kP793U9318Y634Hu04QcC	462	75	1795 27/02/2694 21:16:50	25/07/2224 07:
8	yUn814kR289UA42QkOF452vGH912pOL129Uw195jNB257N	973	2	957 06/01/2969 23:44:09	06/03/2707 04:
9	PE691mGV184FT864K444PD572hMc457uDQ780L187R	755	79	1205 26/09/2303 15:20:52	25/02/2625 03:
10	FZA086uCC554oQH014oCc719Uq022d665dQy396hBo614V	390	79	1952 26/09/2019 03:58:45	28/01/2805 10:
11	qZy727vGo437vWw390uJB160eY1120fC084kQ347wAY735vA	37	9	1807 06/03/2428 05:25:52	26/05/2513 18:
12	kGU869hBU541hZ1216gVg797W6927FfX01QeV982bM494bR	784	7	266 20/06/2276 09:10:13	18/06/2914 08:
13	vGq557zEo497AS116wWk259uJO352hGy181hU6393kAq562nS	587	52	1238 04/09/2775 11:27:18	03/09/3018 03:
14	cFW797aCV835oTc394gT4397Mh134TI682eYf316Mg126vQ	618	25	1527 16/05/2119 03:02:00	12/06/2812 21:
15	wf718aGe511jg889bBC090oO8563pIO357hJ741mIO15ZuK	662	59	662 19/06/2203 23:27:27	11/09/1921 01:
16	dAB01GvV953yCw065uEJ1698h5459vY364nZ328hYL723vG	11	88	1985 19/10/2841 22:51:27	10/08/2428 01:
17	vGH776hHO26DhN587W784gEM559wLd090Yq727m3k144IG	447	89	2100 27/09/2379 03:16:42	15/07/2625 00:
18	uLU698v6T71hKT469qQ756pNA350wW723oRq519vG549vK	971	44	2030 28/09/2788 16:14:18	07/11/2224 15:
19	dUOS47aYr514uUj062vWD992vV025vYC344UB759kRD093K	133	35	1672 14/04/2381 14:46:01	21/10/2512 22:
20	hVW621mKv318Rz22QY211PC789eYw428uUj646hRM789F	1217	6	1581 30/12/1954 11:54:23	13/06/3034 09:
21	wY760Ph244bEm411aWq747hRe611uDC839Bm851Gz075IE	542	62	631 10/12/2624 02:09:01	04/09/2084 02:

1:1 Mailer@labdbwin 22 rows selected in 0.130 seconds (more...)

Enter filter text

Refrigerato

Stovel

Blood\_Donat

DeviceTest\_

Test\_Device

Test\_1

Test\_Tubel

## שאלות בחירה

1. שאלתא שמחברת בין 3 טבלאות- מכשיר, סטט\_מכשיר וסטט. בשביל להוציא את פרטי הטסט. זה כולל תת שאלתא שסופרת את הסך הטסטים שנעשו עבור כל מכשיר.

```
SELECT
    d.DeviceId,
    d.DeviceType,
    t.TestID,
    t.TestDate,
    t.ResultT,
    (SELECT COUNT(*) FROM Test_Device1 td WHERE td.DeviceId = d.DeviceId) AS TotalTests
FROM
    Device1 d
JOIN
    Test_Device1 td ON d.DeviceId = td.DeviceId
JOIN
    Test_1 t ON td.TestID = t.TestID
ORDER BY
    d.DeviceId, t.TestDate;
```

בוחר את כל המכשירים עם הטסטים שלהם כולל את מספר הטסטים שנעשו על כל מכשיר--

```
SELECT
    d.DeviceId,
    d.DeviceType,
    t.TestID,
    t.TestDate,
    t.ResultT,
    (SELECT COUNT(*) FROM Test_Device1 td WHERE td.DeviceId = d.DeviceId) AS TotalTests
FROM
    Device1 d
JOIN
    Test_Device1 td ON d.DeviceId = td.DeviceId
JOIN
    Test_1 t ON td.TestID = t.TestID
ORDER BY
    d.DeviceId, t.TestDate;
```

	DEVICEID	DEVICETYPE	TESTID	TESTDATE	RESULTT	TOTALTESTS
1	03waK1eR32N1aiv9OjMi	92	14UWhXp1P1jq7llyvniE	11/09/2006	QF4vzIWCBdiae6DMcZpVR	2
2	03waK1eR32N1aiv9OjMi	92	h9foIvpzzH1HNVkrT5p	28/06/2009	suakQY7kSiUEvzyjeFTN	2
3	0o3lnEATBqky2vOiibhK	1	6dKTbnc00Ycrob45y5UK	21/10/2022	kjqlqmnin6gw6p8bTRVvk	1
4	18D0bmQF0pT08L9pAb6P	79	nPK5Th5gZ0MvGfKox1	15/10/2008	lclN34GutRZKv1bSnUGqD	3
5	18D0bmQF0pT08L9pAb6P	79	flOzvnQH2JEfOZJ9Gnw	22/12/2008	P6wo5yeh5pWenQXw1rpN	3
6	18D0bmQF0pT08L9pAb6P	79	6frcU4LsrmBgxfid0aU6	04/06/2021	J9wZvgMkfd3dXlQ0r	3
7	1qMAFhgbPMb7p8U4ui	77	mtHjZDjwycCkorpQnUn	19/04/2006	EDFgl0BcqfK5j3pvh	2
8	1qMAFhgbPMb7p8U4ui	77	lsmhwp5X9dY7Y35YR0pN	03/10/2017	c8rpNLt8QD6Ma6YmcNCR	2
9	1suLrYJRcaaf6QpdmM5g	70	bxgyeq39EioMvvggEWbf	30/12/2008	cwOpHdfpwb8dHvQDTxgUV	1
10	1FpJ0uEuB0omP8q3MBHw	72	8MuA9YvayfQCMMy6aUj	01/01/2004	B0V9fOpQic6GZPf7dfk	2
11	1K7C7L6E17Dnm8BxcmABHw	72	8W7G5EcmO5A0T3m15APZC1	10/06/2013	f2V77Tuu6K9d47M5CphmYm	2

2. מחזירה את פרטי תרומת הדם יחד עם תוצאות הטסט ומחשבת את גיל תרומת הדם תוך שימוש בתאריך הנוכחי(כמה זמן עבר מאז שנתרם הדם).

```
SELECT
    bd.DonationID,
    bd.DonorID,
    bd.BloodType,
    bd.DonationDate,
    t.ResultT,
    TRUNC(SYSDATE - bd.DonationDate) AS AgeInDays
FROM
    Blood_Donation1 bd
JOIN
    Test_1 t ON bd.TestID = t.TestID
ORDER BY
    bd.DonationDate DESC;
```

-- מחזירה פרטים של תרומות דם ביחד עם תוצאות הטסט ומחשבת את גיל כל תרומות דם ביימים מהתאריך הנוכחי--  
 -- מחזיר בסדר יורד של תאריכי טיס--

```
SELECT
    bd.DonationID,
    bd.DonorID,
    bd.BloodType,
    bd.DonationDate,
    t.ResultT,
    TRUNC(SYSDATE - bd.DonationDate) AS AgeInDays
FROM
    Blood_Donation1 bd
JOIN
    Test_1 t ON bd.TestID = t.TestID
ORDER BY
    bd.DonationDate DESC;
```

	BLOODTYPE	DONATIONDATE	RESULTT	AGEINDAYS
2	oOh147gBu285dxP071v8f558uGj3Q2fZ229qPv377kRf748pW	24/07/2064 03:22:01	ObAw9aNNLJSgloQFvid	-379089
3	IQP517uKd623aHh723zH112hZa896ePQ566Vl266TM859kY	14/09/2063 13:11:51	4OUA7mOj8k4kzZg7qJMb	-379575
4	pCH788oYP298qYH477xG075yAg245cR021uOO289kH355aU	04/02/2063 02:23:16	uunUhhwCRv9kel3b8lM	-379953
5	dK954IlI7xOY223Oj979wFO59k4DZ715zZl24QyQC924tJ	16/07/2046 13:58:56	v3v660gFN851uUX976gRd424mRz514yfN667dKM190bPH717u	-373207
6	yPv451lRj783qWAD43vTl894fRX628hZD942Cdm689vVR194pZ	04/04/2043 06:27:21	lDHAg6c7y60HfFDPkF6w	-372107
7	fMR884u0169pWt669pMd067yAk381yEn237pIA153vOv524uJ	25/02/2017 20:31:20	ynmu5W3yKulttOPNHFqS	-362574
8	fNS276Yv065yBC571LlJ310qYv643FlJa766FE860Ys765mW	01/06/2013 08:02:49	8xCSO25Mk178yNM8fHZud	-361208
9	uCU540Qz733oNz365IV039cCQ015WZ743Nm616gVv438fG	08/09/2010 23:20:15	zLr968bOU871qV4529bGw647LAU770bOv827aQD895vSD546uB	-360212
10	kFJ116Wx982dOw018lq421wBD325H4p656gTn477eOz687jM	10/08/2991 06:34:33	qIB323mPb995hCW594oXy872bPL761Gd07FTc914cBI448yG	-353243
11	NW8446dU278hJt692aAH166eAD056oKc182Bd4660uPx216dM	10/02/2985 16:04:39	DRAbITc8407pEffbxAX	-350872

3. מחזירה את פרטי מבחנת הטסט שכוללים את המיקום שלה ומחשבת את מספר הימים שותרו לה עד לתאריך התפוגה.

```
SELECT
    tt.TestTubeID,
    tt.LocationTestTube,
    tt.ExpiryDate,
    r.RefrigeratorId,
    r.LocationR,
    tt.ExpiryDate - SYSDATE AS DaysToExpiry
FROM
    Test_Tube1 tt
JOIN
    Refrigerator1 r ON tt.TestTubeID = r.TestTubeID
ORDER BY
    tt.ExpiryDate;
```

חזיר פרטי מבחנות הטסט, שכולל מיקום המבחנה ומחשב את מספר הימים שנותרו עד לתאריך התפוגה--

```
SELECT
    tt.TestTubeID,
    tt.LocationTestTube,
    tt.ExpiryDate,
    r.RefrigeratorId,
    r.LocationR,
    tt.ExpiryDate - SYSDATE AS DaysToExpiry
FROM
    Test_Tube1 tt
JOIN
    Refrigerator1 r ON tt.TestTubeID = r.TestTubeID
ORDER BY
    tt.ExpiryDate;
```

TESTTUBEID	LOCATIONTESTTUBE	EXPIRYDATE	REFRIGERATORID	LOCATIONR
1   xH145hDz297bWP928qHd497dDN693qEn715mCM473d6R494wF	USA	30/04/1900 16:40:30	a0O448Dv4311dAq340:8b299nH1692Oh777h4c768jUJ959pE	LR1628Gv914xGL988HV085pHj158DA611tHY3778EP
2   BC099FR899CT332gLB97zeAm4265m136u8B027c5u913uR	USA	07/03/1922 22:44:24	vPU1748fIN428pIQ213uSP415FZJ154nYg9791c278kYE714nQ	zBQ164vY629wP1264AI712w9W971qX0191JNp062pAZ
3   t7r554Gv216oKu740yV1189vVU987qBL390ZC0820mX570eR	Italy	07/10/2016 10:59:13	gWY265yMj670aTw240nQH799pIn667nTy491wRf687nPr968uN	xBL257JLT561mE:043yDL265Zg042uZw597RvX983Uj59
4   t7r554Gv216oKu740yV1189vVU987qBL390ZC0820mX570eR	Italy	07/10/2016 10:59:13	wfU802cG:921aMG254eUX5458m777Cb794Vz915kTb016eB	fFU1548f782cVZ477Kf984yOP539wKQ935PfC465nPB
5   X3YnVa9z96uU95jnSzi	ChZefNOmorPX0nkDz8VA	15/02/2024	DDyIpbp93GLite8YKVF	iQDpVpYAvUuHIOF6p59m

4. מחברת בין כמה טבלאות כדי לקבל פרטי מכשיר ותאריך שימוש אחרון. גם מחשבת את המספר הכללי של הטסטים שנעשו והזמן הממוצע שעבר ביניהם.

```
WITH TestIntervals AS (
    SELECT
        d.DeviceId,
        d.DeviceType,
        d.LastMaintenanceDate,
        t.TestID,
        t.TestDate,
        LAG(t.TestDate) OVER (PARTITION BY d.DeviceId ORDER BY t.TestDate) AS
PrevTestDate
    FROM
        Device1 d
    LEFT JOIN
        Test_Device1 td ON d.DeviceId = td.DeviceId
    LEFT JOIN
        Test_1 t ON td.TestID = t.TestID
)
SELECT
    DeviceId,
    DeviceType,
    LastMaintenanceDate,
    COUNT(TestID) AS NumberOfTests,
    AVG(TestDate - PrevTestDate) AS AvgTimeBetweenTests
FROM
    TestIntervals
GROUP BY
    DeviceId,
    DeviceType,
    LastMaintenanceDate
ORDER BY
    NumberOfTests DESC;
```

```
WITH TestIntervals AS (
    SELECT
        d.DeviceId,
        d.DeviceType,
        d.LastMaintenanceDate,
        t.TestID,
        t.TestDate,
        LAG(t.TestDate) OVER (PARTITION BY d.DeviceId ORDER BY t.TestDate) AS PrevTestDate
    FROM
        Device1 d
    LEFT JOIN
        Test_Device1 td ON d.DeviceId = td.DeviceId
    LEFT JOIN
        Test_1 t ON td.TestID = t.TestID
)
SELECT
    DeviceId,
    DeviceType,
    LastMaintenanceDate,
    COUNT(TestID) AS NumberOfTests,
    AVG(TestDate - PrevTestDate) AS AvgTimeBetweenTests
FROM
    TestIntervals
GROUP BY
    DeviceId,
    DeviceType,
    LastMaintenanceDate
```

	DEVICEID	DEVICETYPE	LASTMAINTENANCEDATE	NUMBEROFTESTS	AVGTIMEBETWEENTESTS
1	DL0CQIDwQZOAHUFC86C	...	26 16/10/2017	5	82696.2433738426
2	JfyxkJE9AWlpRA6FnVTh	...	19 05/05/2005	5	95382.7063744213
3	dk7GxRPa0LLsA7kzNw4	...	49 05/11/2009	5	94483.7163975694
4	VSGNUhHSO7effsHACTZ	...	96 27/03/2009	4	2602.6666666667

## שאלות עידכון

4. מעדכן מיקום למכשיר מסוג 83 שלא השתמשו בו למעלה משנה

5. UPDATE
6. Device1
7. SET
8. LocationD = 'Israel'
9. WHERE
10. DeviceType = 83
11. AND LastMaintenanceDate < ADD\_MONTHS(SYSDATE, -12);
- 12.

לפני:

```
SELECT* from Device1;
SELECT* from Test_Tube1;
SELECT* from Test_1;
SELECT* from Test_Device1;
SELECT* from DeviceTest_Tube1;
SELECT* from Blood_Donation1;
SELECT* from Stove1;
SELECT* from Refrigerator1;
```

DEVIDEID	DEVICETYPE	SERIESNUM	VERSIOND	MANUFACTURER	PURCHASEDATE	LASTMAINTENANCEDATE	LOCATIOND
1	83	193	0	9E6uEKFOsINXZIRZVZm	17/06/2017	05/12/2012	d79e4zWj/pnT6nu3uXBa
2	31	760	9	PvL2vp1kgRPSYTZaTE	16/09/2003	13/04/2010	evqj5CvnUWTSsjpFOr8
3	46	436	2	WfFvJLbwrlcYzZdpL5G	04/04/2010	25/09/2010	mfFjXEDHUPMHZDlvApsT
4	73	748	9	sApvxdDVio2s9G4AMJ3C	12/03/2020	20/04/2000	r964gYNL8H8739jYgrf
5	98	717	0	SUOVQmny59Rv11gmYE9UT	28/04/2015	17/09/2012	44liM4MUowLILqKcO3aF
6	28	78	5	kOoE53yAvvNokKfoZ	21/07/2022	14/02/2022	ZD0oIkOCpUln38j3TNS
7	97	566	0	4yz29FkoMl3yOo5LkO	02/01/2017	07/06/2021	T2L8toOv80V7uBCIBz4k
8	72	454	9	M6EHEDvYBTeE8NlJNGI	15/12/2003	16/06/2009	nKJKSoHl1FISl79woA8b
9	81	945	5	jqzW204LWuG9yZOKICIdS	20/10/2014	17/06/2013	wzhwN0gCbvLVs5AashXz1
10	92	982	1	jczdVIMgtOWi1bPOF0Pe	24/08/2005	22/09/2000	Jr4ACbfmLDAmlea6aEx2
11	56	975	7	wunWfIKlIBHR7kOOZMg	15/10/2013	15/03/2001	6XU6fYgyvPINP27U6VOQ
12	90	132	2	D5Ui763SK6E65vK4H4I	04/12/2002	06/11/2000	TY7m6wThJN67Z6x0MzqG
13	16	424	5	ZzGwKulUg7dQ7zrrdka	13/10/2015	28/04/2020	KzH7jthfIUrmwz15LHu3

אחרי:

```
SELECT* from Device1;
SELECT* from Test_Tube1;
SELECT* from Test_1;
SELECT* from Test_Device1;
SELECT* from DeviceTest_Tube1;
SELECT* from Blood_Donation1;
SELECT* from Stove1;
SELECT* from Refrigerator1;
```

DEVIDEID	DEVICETYPE	SERIESNUM	VERSIOND	MANUFACTURER	PURCHASEDATE	LASTMAINTENANCEDATE	LOCATIOND
1	83	193	0	9E6uEKFOsINXZIRZVZm	17/06/2017	05/12/2012	Israel
2	31	760	9	PvL2vp1kgRPSYTZaTE	16/09/2003	13/04/2010	evqj5CvnUWTSsjpFOr8
3	46	436	2	WfFvJLbwrlcYzZdpL5G	04/04/2010	25/09/2010	mfFjXEDHUPMHZDlvApsT
4	73	748	9	sApvxdDVio2s9G4AMJ3C	12/03/2020	20/04/2000	r964gYNL8H8739jYgrf
5	98	717	0	SUOVQmny59Rv11gmYE9UT	28/04/2015	17/09/2012	44liM4MUowLILqKcO3aF

## 2. מעדכן שימוש אחרון ומיקום למכשירים שנעשה בהם שימוש בשלוש השנים האחרונות.

```

4. --update2
5.
6. מעדכן שימוש אחרון ומיקום למכשירים שנעשה בהם שימוש בשלוש השנים האחרונות.
7. commit
8. UPDATE
9. Device1
10. SET
11. LastMaintenanceDate = SYSDATE,
12. LocationD='USA'
13. WHERE
14. DeviceId IN (
15. SELECT td.DeviceId
16. FROM Test_Device1 td
17. JOIN Test_1 t ON td.TestID = t.TestID
18. WHERE t.TestDate > SYSDATE
19. );

```

לפני:

DEVICEID	DEVICETYPE	SERIENUM	VERSIOND	MANUFACTURER	PURCHASEDATE	LASTMAINT
1	20	81	1	vZv143e167aVU113dJU824mF5241vCw492mBH222gUL172hD	21/05/2549 05:04:42	30/07/2567 00:03:53
2	55	570	10	vZT074mQj667yLw081Rn048vG6479ZU785yK5569Gf827aL	15/11/2386 20:06:17	29/02/2669 1
3	15	943	1	hUs798vZ798vH677aOV7146SY927Z3823Ao011bAw954dQ	18/11/1987 10:51:53	02/06/2709 0
4	6	765	10	gZq198PZ41bOCT816pA432274679ZU115pK645fT21Z	17/01/2007 20:58:27	18/01/2618 1
5	60	927	6	yA0211A4 077jON899kM099wUY181wE6797mKc562cCF962wH	28/02/2045 05:18:05	14/05/2095 1
6	19	790	0	Kxg830QfW951BK742jGQ342iN0738uQJ746vY890bC492CZ	11/10/2216 09:23:28	24/01/2614 2
7	78	332	9	oC540eQ672nRK937pYY460Xa218mOP520KxS472vV998nO	20/11/2443 00:01:35	15/03/2269 2
8	80	239	4	jFC556eOK925dER039Nk433jST953Gn492oG4647cPE254v	21/05/2743 15:24:11	30/09/2502 1
9	66	8	0	sSH424gUq132wUG496Uj348vA935pEx625Ym044zNT665gl	07/09/2076 13:19:12	02/01/2924 1
10	31	321	9	jCt065zAR128RH044Lj492gCj367dMx737uOU624ePM818gG	05/02/2416 17:18:57	14/07/2199 0
11	25	449	6	xPK398Z0413xDc384fU740dfg685hDR395bQJ757bSH971eE	24/02/2391 11:10:45	30/10/2682 0
12	51	995	1	zKx887eUj438O1880kLw086uOy814Fxe691nUg956dPz962rB	18/03/2620 14:25:35	27/06/2220 2
13	14	661	8	oBt574iOV251kU587kV868LL180bOh258vOT021bSR950mF	21/07/2478 21:12:57	06/05/2709 1

אחרי:

DEVIDEID	DEVICETYPE	SERIENUM	VERSIOND	MANUFACTURER	PURCHASEDATE	LASTMAINTENANCE DATE	LOCATIOND
1	20	81	1	vZv143e167aVU113dJU824mF5241vCw492mBH222gUL172hD	21/05/2549 05:04:42	30/07/2567 00:03:53	USA
2	55	570	10	vZT074mQj667yLw081Rn048vG6479ZU785yK5569Gf827aL	15/11/2386 20:06:17	29/02/2669 1	USA
3	15	943	1	hUs798vZ798vH677aOV7146SY927Z3823Ao011bAw954dQ	18/11/1987 10:51:53	02/06/2709 0	USA
4	6	765	10	gZq198PZ41bOCT816pA432274679ZU115pK645fT21Z	17/01/2007 20:58:27	18/01/2618 1	USA
5	60	927	6	yA0211A4 077jON899kM099wUY181wE6797mKc562cCF962wH	28/02/2045 05:18:05	14/05/2095 1	USA
6	19	790	0	Kxg830QfW951BK742jGQ342iN0738uQJ746vY890bC492CZ	11/10/2216 09:23:28	24/01/2614 2	USA
7	78	332	9	oC540eQ672nRK937pYY460Xa218mOP520KxS472vV998nO	20/11/2443 00:01:35	15/03/2269 2	USA
8	80	239	4	jFC556eOK925dER039Nk433jST953Gn492oG4647cPE254v	21/05/2743 15:24:11	30/09/2502 1	USA
9	66	8	0	sSH424gUq132wUG496Uj348vA935pEx625Ym044zNT665gl	07/09/2076 13:19:12	02/01/2924 1	USA
10	31	321	9	jCt065zAR128RH044Lj492gCj367dMx737uOU624ePM818gG	05/02/2416 17:18:57	14/07/2199 0	USA
11	25	449	6	xPK398Z0413xDc384fU740dfg685hDR395bQJ757bSH971eE	24/02/2391 11:10:45	30/10/2682 0	USA
12	51	995	1	zKx887eUj438O1880kLw086uOy814Fxe691nUg956dPz962rB	18/03/2620 14:25:35	27/06/2220 2	USA
13	14	661	8	oBt574iOV251kU587kV868LL180bOh258vOT021bSR950mF	21/07/2478 21:12:57	06/05/2709 1	USA



## שאלות מחיקה

4. מוחק תרומות דם שנעשו לפני יותר משנתיים. מוחק מכל הטבלאות הקשורות בזה.

```

5. BEGIN
6.     -- Delete related records in Refrigerator1
7.     DELETE FROM Refrigerator1
8.     WHERE DonationID IN (
9.         SELECT DonationID
10.        FROM Blood_Donation1
11.        WHERE DonationDate < ADD_MONTHS(SYSDATE, -24)
12.    );
13.
14.    -- Delete related records in Test_Device1
15.    DELETE FROM Test_Device1
16.    WHERE TestID IN (
17.        SELECT TestID
18.        FROM Test_1
19.        WHERE BloodDonationID IN (
20.            SELECT DonationID
21.            FROM Blood_Donation1
22.            WHERE DonationDate < ADD_MONTHS(SYSDATE, -24)
23.        )
24.    );
25.
26.    -- Delete related records in Blood_Donation1
27.    DELETE FROM Blood_Donation1
28.    WHERE DonationDate < ADD_MONTHS(SYSDATE, -24);
29.
30.    -- Delete records in Test_1
31.    DELETE FROM Test_1
32.    WHERE BloodDonationID IN (
33.        SELECT DonationID
34.        FROM Blood_Donation1
35.        WHERE DonationDate < ADD_MONTHS(SYSDATE, -24)
36.    );
37.

```

לפני:

```

SELECT* FROM Stove1;
SELECT* FROM Refrigerator1;

select * from Blood_Donation1
where DonationDate < ADD_MONTHS(SYSDATE, -24);

select * from Device1
where LastMaintenanceDate > SYSDATE
;
select * from Device1

```

	DONATIONID	DONORID	BLOODTYPE	DONATIONDATE	VOLUMEDONATED	TESTRESULTID	TESTID
1	Gy6Dz0mbrqChvSg7DqA	wwemDqUakyf7Phhw759z	KTZ6vFty3Cm4WkogV2q	14/02/2022	321	qH1ObcncpnjMdnXHVWz	r1pTidWF7ujWgd26Gr8l
2	kgIj278yESQP0NyZdpm	nPKgAZXTkuqY0sZelaa	FXZHDnRShj7JUnSGap0g	19/05/2022	328	qXqgO8eBYfoMySaVhQR4	kV3waV0uujuuwOxs4jnYdQE

אחרי:

```

SELECT * from Blood_Donation1
WHERE DonationDate < ADD_MONTHS(SYSDATE, -24);
SELECT * from Device1
WHERE VersionD =0;

```

DONATIONID	DONORID	BLOODTYPE	DONATIONDATE	VOLUMEDONATED	TESTRESULTID	TESTID
------------	---------	-----------	--------------	---------------	--------------	--------

```

WHERE DeviceId IN (
    SELECT DeviceId
    FROM Device1
    WHERE VersionD =0
);

```

-- Delete related records in Test\_Device1

```

DELETE FROM Test_Device1
WHERE DeviceId IN (
    SELECT DeviceId
    FROM Device1
    WHERE VersionD =0
);

```

-- Delete related records in DeviceTest\_Tube1

```

DELETE FROM DeviceTest_Tube1
WHERE DeviceId IN (
    SELECT DeviceId
    FROM Device1
    WHERE VersionD =0
);

```

-- Delete devices of type 83

```

DELETE FROM Device1
WHERE VersionD =0;

```

END;

לפני:

```

SELECT * from Device1
WHERE VersionD =0;

```

DEVID	DEVICETYPE	SERIESNUM	VERSIOND	MANUFACTURER	PURCHASEDATE	LASTMAINTEN
3	GmrbtE8X9GMV5T3U16	97	566	0 4yz28FKoM3yOo5LkO	02/01/2017	07/06/2021
4	evFPXla550Tntc3wQA6	81	356	0 gNLtYjAjraE1DbIma50s	19/08/2007	11/09/2014
5	grtD2XQAJgTZPtc6gRn	49	975	0 iNe9yIsXh2Pg3MQOKN4N	14/09/2004	17/02/2006
6	dYCqiwEngdq1XkHDdw4	52	252	0 O3RnDyYASoxWcAJMmaFz	24/12/2006	16/06/2024 15:4
7	vssuOoN770YrOIlvsPVV	78	346	0 PwWjuX8ydl3oEpGRNBrl	21/04/2010	19/11/2007
8	aRq239bWc744iPX032vYt722mOK220mG743jPz879bDi791rD	34	863	0 rTg078aUk934kAp63jSh449wOZ455gHg590Aq535fEn614gL	04/09/2150 08:56:15	16/06/2024 15:4
9	xMi989cSB761sHg465cAE340LD332yAw971gGR536aPz095oX	19	790	0 kXq030oRw951tBK742cGQ342fNQ738uQ1744kVY890aBC492cZ	11/10/2216 09:23:28	24/01/2614 23:2
10	zUZ677LRK714RF180BX550EJ057hBU879Zy687eET829cT	66	8	0 sSH424gUq132wUg496Uj348vAA95pEz625Ym044eNT665gl	07/09/2076 13:19:12	02/01/2924 13:C
11	vFn171oTa222mWz244SY389cKD418pHr169qW0076ZV082xT	75	457	0 tMb596vWF817kQW323KL0976oJb750pCP498lIN124d1117vW	03/07/2786 10:56:38	16/06/2024 15:4
12	zBy324vQv417INy039YD886cVz156dER439wDx334zSZ994bX	67	815	0 kGX890vUP971pJc557oRc283dL398bDE189cOo314nCV131rD	02/12/2013 08:02:41	09/03/2047 03:4
13	uIZ657jPN064fP869wEL643nVr345vMH131vGI012rC5458pN	6	974	0 kZM931mUP572qZB190nlq178mLa824mFT264wNy245dWj287vW	15/10/2927 20:42:34	03/01/2657 11:1
14	vOQ374kKp447c50261kCr298qQm140vO017aYb179bDG870XS	25	598	0 uYJ128vSA335hHs482nZB658qNg627vY913bLV546vAr763wL	01/05/2481 12:05:36	30/12/2873 09:3

אחרי:

```

SELECT * from Device1
WHERE VersionD =0;

```

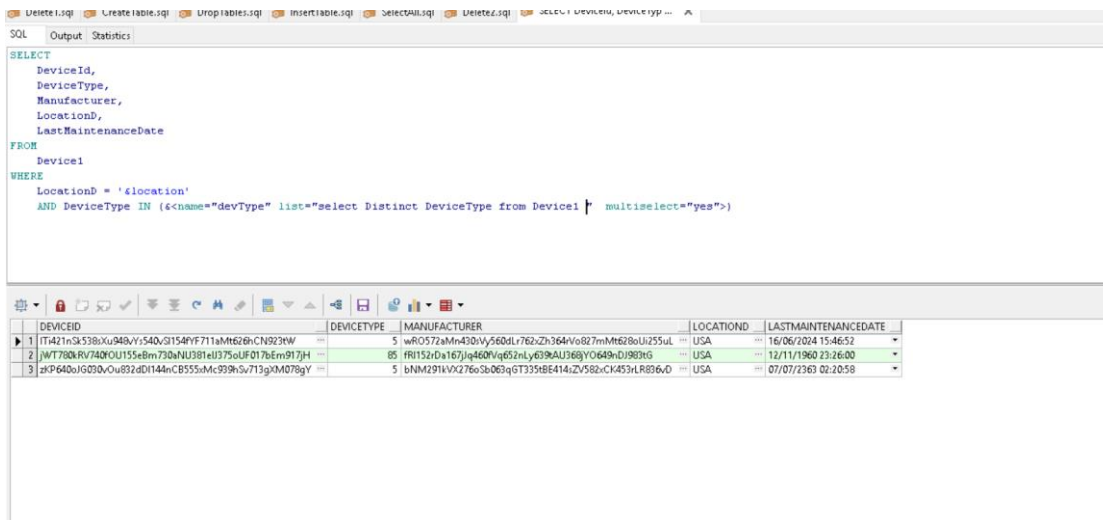
DEVID	DEVICETYPE	SERIESNUM	VERSIOND	MANUFACTURER	PURCHASEDATE	LASTMAINTENANCE DATE	LOCATIONID
-------	------------	-----------	----------	--------------	--------------	----------------------	------------

## שאלות עם פרמטרים

(כל הצילומי מסך הנצרכים נמצאים באותו צילום מסך...)

1. מחזיר פרטי מכשיר שנמצא במיקום מסוים וסוג המכשיר שלו נבחר מרשימת סוגי המכשירים האפשריים.

```
SELECT
    DeviceId,
    DeviceType,
    Manufacturer,
    LocationD,
    LastMaintenanceDate
FROM
    Device1
WHERE
    LocationD = '&location'
    AND DeviceType IN (&<name="devType" list="select Distinct DeviceType from
Device1 " multiselect="yes">)
```



The screenshot shows a database management tool interface. The top part displays a SQL query in a text editor. The bottom part shows the results of the query in a table format.

**SQL Query:**

```
SELECT
    DeviceId,
    DeviceType,
    Manufacturer,
    LocationD,
    LastMaintenanceDate
FROM
    Device1
WHERE
    LocationD = '&location'
    AND DeviceType IN (&<name="devType" list="select Distinct DeviceType from Device1 " multiselect="yes">)
```

**Results Table:**

DEVID	DEVICETYPE	MANUFACTURER	LOCATIOND	LASTMAINTENANCEDATE
1 IT421nS4538XU949VY540VG154FYF711aMt626hCN9234W	5	wRO572aMn430bV560dLr762zZh364V0827mM628oUj255uL	USA	16/06/2024 15:46:52
2 JMT780kRV740OU155eBm730aUJ381eUJ375oUF017bEm917JH	85	fR152rDa167jng460Nvq652nLy639AU368YO649hDJ983tG	USA	12/11/1960 23:26:00
3 zKp640uIG030vOu892dD144nCB555uMc939hSv713gXm078gY	5	bNM291uVX276o3b063qGT335HBE414uZV582vCK453rLR836vD	USA	07/07/2363 02:20:58

## 2. מחזיר פרטי מבחנת סטט שעומדת בקיבול שניתנה ובתאריך תפוגה שהוקש.

```
SELECT
    TestTubeID,
    Material,
    VolumeCapacity,
    ExpiryDate,
    LocationTestTube
FROM
    Test_Tube1
WHERE
    VolumeCapacity > &<name="volumeCapacity">
    AND ExpiryDate < &<name="Expdate" type="date" required=true>
ORDER BY
    VolumeCapacity DESC;
```

The screenshot displays a database application interface. The top panel shows a SQL query editor with the following query:

```
SELECT
    TestTubeID,
    Material,
    VolumeCapacity,
    ExpiryDate,
    LocationTestTube
FROM
    Test_Tube1
WHERE
    VolumeCapacity > &<name="volumeCapacity">
    AND ExpiryDate < &<name="Expdate" type="date" required=true>
ORDER BY
    VolumeCapacity DESC;
```

A 'Variables' dialog box is open, showing the following values:

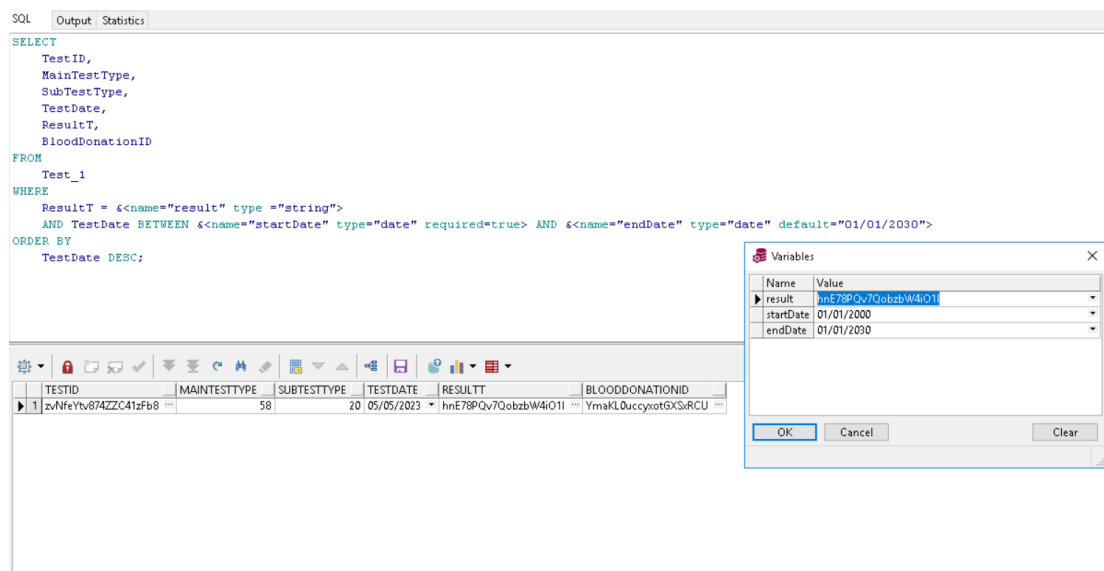
Name	Value
volumeCapacity	120
Expdate	01/01/2030

The bottom panel shows the results of the query in a table with 5 columns: TESTTUBEID, MATERIAL, VOLUMECAPACITY, EXPIRYDATE, and LOCATIONTESTTUBE. The table contains 13 rows of data.

TESTTUBEID	MATERIAL	VOLUMECAPACITY	EXPIRYDATE	LOCATIONTESTTUBE	
1	BPx7Q5ajOgDyaymXyyhe	56	499	10/01/2025	zu0FHfeGPqroleRNF1J8
2	u2SDQnQDWAfUe6FutlDs	56	498	11/02/2029	FDB2wfFje1o9dnnMn33
3	FsiY90IVKToZtgEnGCao	40	493	26/06/2014	eX8q749ZIHhtMMIDSLP7
4	Vfszel8FequQllp0uLKg	91	493	25/04/2009	WVP2YygWnSjNGUAArObf
5	Vhh703tZlp1tZ7GoZbWx	37	491	12/10/2024	HkoPkerdANrHxUBECuA
6	IgEzW2nTs8uUsYpC2tDe	82	491	21/09/2029	ciRDbfMZWW1Jee8YvEA
7	qPLMLhpuSTGG8k4w6CW	92	487	25/03/2025	VY21eCtpXsrMjL43xG9Z
8	fw8vScVybteAl6yZY2D9	56	486	08/10/2021	yUKIANOBbuCKJBTlNeoB
9	aiV9KjwbE6F3pmLV91pR	96	484	21/06/2029	c8YuhV2mkILuZGY5PrQ
10	JISjE5nSCf73HoP09mCG	58	483	02/09/2015	vsVuMpoXo3Qt15wNUj9
11	mO9gBCFrfvPNlWAh64De	99	482	26/05/2010	aO6hvaHacWlyZ6N7wJ3d
12	Vdq9FHHtOalQhwZQfa1S	38	479	20/03/2025	gi3OqftRmMqVGDruhCuR
13	nZCfK3UFFO746eW4FyN	4	478	26/05/2028	PEcNf8UunnO8BfoLL2Gg

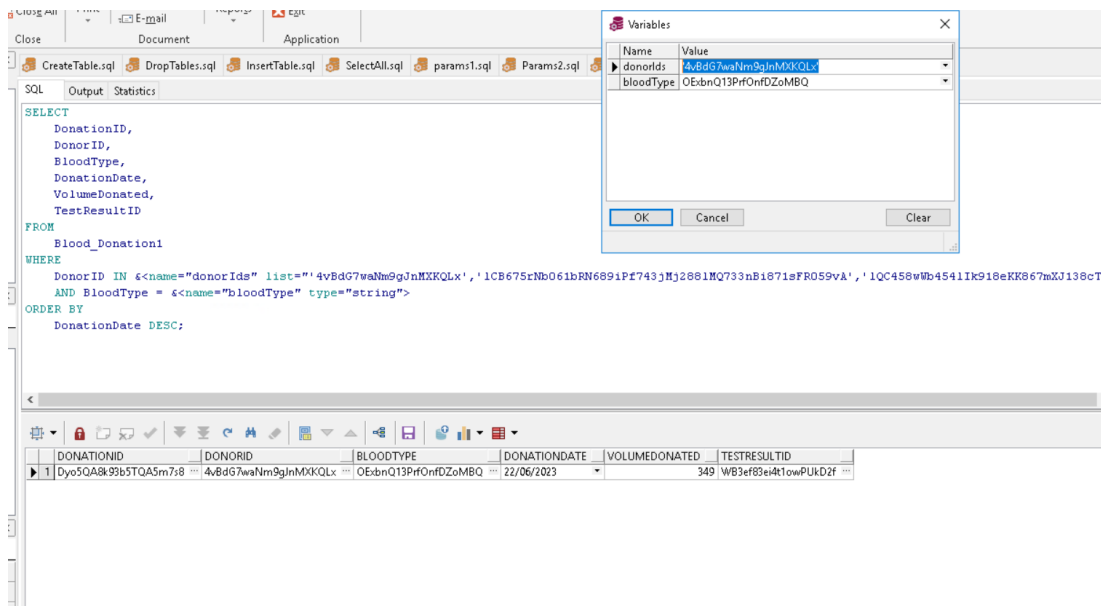
3. מחזיר פרטי טסט עבור תוצאה שהתקבלה ושנמצא בין 2 תאריכים שהוקשו. התאריך סיום הינו אופציונלי.

```
SELECT
    TestID,
    MainTestType,
    SubTestType,
    TestDate,
    ResultT,
    BloodDonationID
FROM
    Test_1
WHERE
    ResultT = &<name="result" type="string">
    AND TestDate BETWEEN &<name="startDate" type="date" required=true> AND
    &<name="endDate" type="date" default="01/01/2030">
ORDER BY
    TestDate DESC;
```



4. מחזיר פרטי תרומת דם כאשר הID שלה נבחר מבין רשימת ID's וסוג הדם מוקש.

```
SELECT
    DonationID,
    DonorID,
    BloodType,
    DonationDate,
    VolumeDonated,
    TestResultID
FROM
    Blood_Donation1
WHERE
    DonorID IN &<name="donorIds"
list="'4vBdG7waNm9gJnMXKQLx','1CB675rNb061bRN689iPf743jMj288lMQ733nBi871sFR059v
A','1QC458wWb454lIk918eKK867mXJ138cTQ765yBq713qKp529eA'">
    AND BloodType = &<name="bloodType" type="string">
ORDER BY
    DonationDate DESC;
```

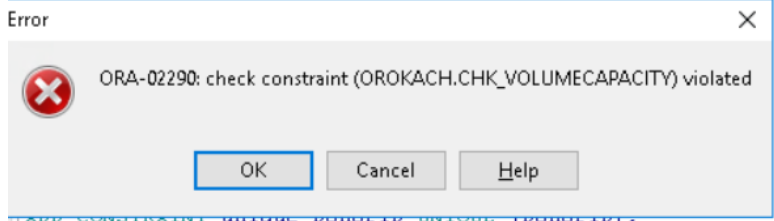


## אילוצים

1. הוספת אילוץ check ל-TestTube שבדוק שמוכנס רק ערך חיובי ל-VolumeCapacity.

```
ALTER TABLE Test_Tube1
ADD CONSTRAINT chk_VolumeCapacity CHECK (VolumeCapacity > 0);

INSERT INTO Test_Tube1 (TestTubeID, Material, VolumeCapacity, PurchaseDate, ExpiryDate)
VALUES ('TT001', 1, -10, TO_DATE('2024-01-01', 'YYYY-MM-DD'), TO_DATE('2025-01-01', 'YYYY-MM-DD'));
```



Error

ORA-02290: check constraint (OROKACH.CHK\_VOLUMECAPACITY) violated

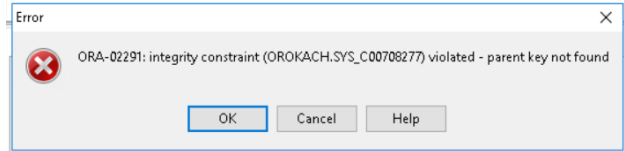
OK Cancel Help

2. הוספת אילוץ ל-BLOOD DONATION שעבורו השדה DONORID יהיה ייחודי.

```
ALTER TABLE Blood_Donation1
ADD CONSTRAINT unique_DonorID UNIQUE (DonorID);

INSERT INTO Blood_Donation1 (DonationID, DonorID, BloodType, DonationDate, VolumeDonated, TestResultID, TestID)
VALUES ('BD001', 'DON001', 'A+', TO_DATE('2023-01-01', 'YYYY-MM-DD'), 500, 'TRO01', 'T001');

-- Attempt to insert a duplicate DonorID
INSERT INTO Blood_Donation1 (DonationID, DonorID, BloodType, DonationDate, VolumeDonated, TestResultID, TestID)
VALUES ('BD002', 'DON001', 'B+', TO_DATE('2023-02-01', 'YYYY-MM-DD'), 450, 'TRO02', 'T002');
```



Error

ORA-02291: integrity constraint (OROKACH.SYS\_C00708277) violated - parent key not found

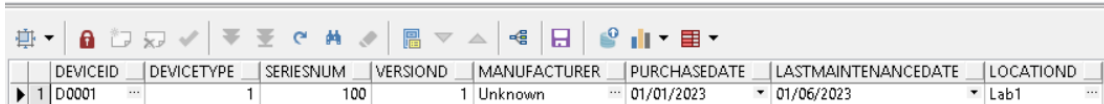
OK Cancel Help

3. הוספת ערך ברירת מחדל ל-Device1 עבור Manufacturer.

```
ALTER TABLE Device1
MODIFY Manufacturer DEFAULT 'Unknown';

INSERT INTO Device1 (DeviceID, DeviceType, SeriesNum, VersionD, PurchaseDate, LastMaintenanceDate, LocationD)
VALUES ('D0001', 1, 100, 1, TO_DATE('2023-01-01', 'YYYY-MM-DD'), TO_DATE('2023-06-01', 'YYYY-MM-DD'), 'Lab1');
```

```
select * from Device1
where Manufacturer = 'Unknown';
```



	DEVICEID	DEVICETYPE	SERIESNUM	VERSIOND	MANUFACTURER	PURCHASEDATE	LASTMAINTENANCEDATE	LOCATIOND
1	D0001	...	1	100	1	Unknown	...	01/01/2023
								01/06/2023
								Lab1

## Procedures

1. הוספת מכשיר חדש לבסיס הנתונים בכל מקרה שחסר נתון מסוים, זורקת חריגה שאומרת איזה נתון חסר.

```
) CREATE OR REPLACE FUNCTION mostDonations
    ,FromDate IN DATE
    ,ToDate IN DATE
    RETURN VARCHAR2 (
        IS
        ;(100)FunctionResult VARCHAR2
        ;MostDonationCount NUMBER
        ;(50)MostDonorID VARCHAR2
        BEGIN
        BEGIN
        SELECT DonorID, COUNT(DonationID) AS DonationCount
            INTO MostDonorID, MostDonationCount
            FROM Blood_Donation1
        WHERE DonationDate BETWEEN FromDate AND ToDate
            GROUP BY DonorID
            ORDER BY DonationCount DESC
        FETCH FIRST 1 ROWS ONLY; -- Use the correct Oracle syntax for fetching the
                                   first row

        ;FunctionResult := MostDonorID || ', ' || MostDonationCount
        EXCEPTION
        WHEN NO_DATA_FOUND THEN
        ;FunctionResult := 'No donations found in the given date range
        WHEN OTHERS THEN
        ;FunctionResult := 'An error occurred: ' || SQLERRM
        ;END
        ;RETURN FunctionResult
        ;END mostDonations
```



```

) CREATE OR REPLACE FUNCTION validateMaintenance
    AllowedPeriod IN NUMBER
    RETURN VARCHAR2 (
        IS
        CURSOR device_cursor IS
        SELECT DeviceId, LastMaintenanceDate
        ;FROM Device1

device_rec device_cursor%ROWTYPE;--for calculating dates
;e_OverdueMaintenance EXCEPTION
;(200)v_error_message VARCHAR2
;overdue_days NUMBER

BEGIN
;OPEN device_cursor

LOOP
;FETCH device_cursor INTO device_rec
;EXIT WHEN device_cursor%NOTFOUND

overdue_days := TRUNC(SYSDATE) -
;TRUNC(device_rec.LastMaintenanceDate)

Check if the device's last maintenance date exceeds the allowed period --
AllowedPeriod THEN < IF overdue_days
v_error_message := 'Device ' || device_rec.DeviceId || ' is overdue for
;.maintenance by ' || (overdue_days - AllowedPeriod) || ' days
;RAISE e_OverdueMaintenance
;END IF
;END LOOP

;CLOSE device_cursor

;RETURN 'All devices are within the allowed maintenance period

EXCEPTION
WHEN e_OverdueMaintenance THEN
;RETURN v_error_message
WHEN OTHERS THEN
;RETURN 'An unexpected error occurred: ' || SQLERRM
;END validateMaintenance

```

```

)CREATE OR REPLACE PROCEDURE InsertNewDevice
    ,IN VARCHAR2      p_DeviceId
    ,IN NUMBER        p_DeviceType
    ,IN NUMBER        p_SeriesNum
    ,IN NUMBER        p_VersionD
    ,IN VARCHAR2      p_Manufacturer
    ,IN DATE          p_PurchaseDate
    ,p_LastMaintenanceDate IN DATE
    IN VARCHAR2      p_LocationD
    IS (
    Define custom exception for missing values --
        ;e_MissingValue EXCEPTION
        ;(100)v_MissingField VARCHAR2
        BEGIN
            Check for missing values --
            IF p_DeviceId IS NULL THEN
                ;'v_MissingField := 'DeviceId
                ;RAISE e_MissingValue
            ELSIF p_DeviceType IS NULL THEN
                ;'v_MissingField := 'DeviceType
                ;RAISE e_MissingValue
            ELSIF p_SeriesNum IS NULL THEN
                ;'v_MissingField := 'SeriesNum
                ;RAISE e_MissingValue
            ELSIF p_VersionD IS NULL THEN
                ;'v_MissingField := 'VersionD
                ;RAISE e_MissingValue
            ELSIF p_Manufacturer IS NULL THEN
                ;'v_MissingField := 'Manufacturer
                ;RAISE e_MissingValue
            ELSIF p_PurchaseDate IS NULL THEN
                ;'v_MissingField := 'PurchaseDate
                ;RAISE e_MissingValue
            ELSIF p_LastMaintenanceDate IS NULL THEN
                ;'v_MissingField := 'LastMaintenanceDate
                ;RAISE e_MissingValue
            ELSIF p_LocationD IS NULL THEN
                ;'v_MissingField := 'LocationD
                ;RAISE e_MissingValue
            ;END IF

            Insert the new device record --
            INSERT INTO Device1 (DeviceId, DeviceType, SeriesNum, VersionD,
                Manufacturer, PurchaseDate, LastMaintenanceDate, LocationD)
                VALUES (p_DeviceId, p_DeviceType, p_SeriesNum, p_VersionD,
;p_Manufacturer, p_PurchaseDate, p_LastMaintenanceDate, p_LocationD)

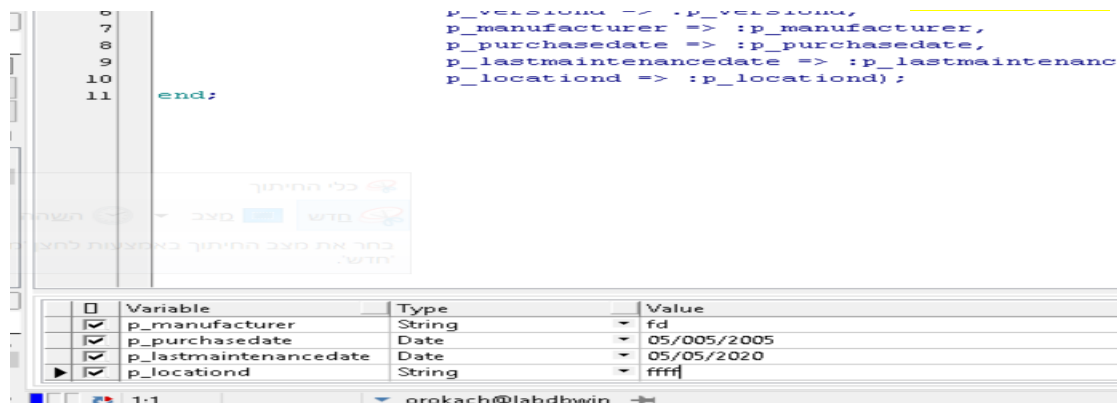
;COMMIT

```

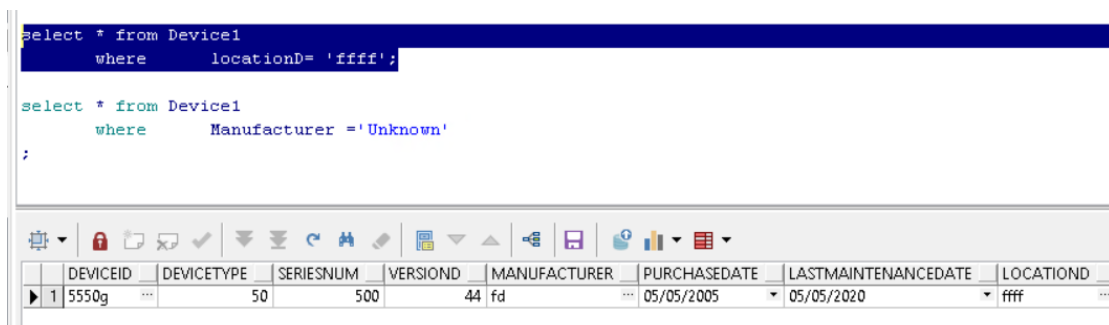
```

EXCEPTION
    WHEN e_MissingValue THEN
;DBMS_OUTPUT.PUT_LINE('Error: Missing value for ' || v_MissingField)
;ROLLBACK
    WHEN OTHERS THEN
;DBMS_OUTPUT.PUT_LINE('An unexpected error occurred: ' || SQLERRM)
;ROLLBACK
;END InsertNewDevice

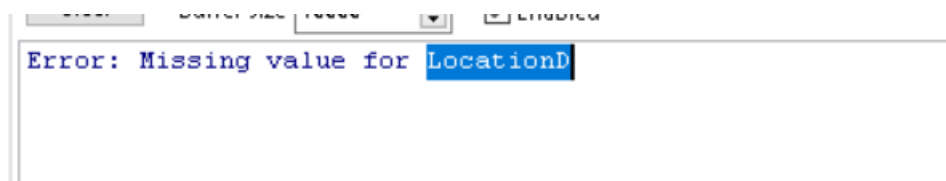
```



לאחר הרצה:



חריגה:



2. עבור שני תז של מכשירים מחזיר רשימה לפי תאריכים עבור הימים שהיה להם את אותו מספר טסטים.

```

) CREATE OR REPLACE PROCEDURE FindSameTestDate
    ,p_DeviceId1 IN VARCHAR2
    ,p_DeviceId2 IN VARCHAR2

```

```

IS (
    Variables to store test counts --
    ;v_Device1_TestCount INT := 0
    ;v_Device2_TestCount INT := 0
    ;v_TestDate DATE

    Cursor to fetch test counts for each device on each date --
    CURSOR test_cursor IS
    ,SELECT t.TestDate
COUNT(CASE WHEN td.DeviceId = p_DeviceId1 THEN 1 END) AS
    ,Device1_TestCount
COUNT(CASE WHEN td.DeviceId = p_DeviceId2 THEN 1 END) AS
    ,Device2_TestCount
FROM Test_Device1 td
JOIN Test_1 t ON td.TestID = t.TestID
GROUP BY t.TestDate
HAVING COUNT(CASE WHEN td.DeviceId = p_DeviceId1 THEN 1 END) =
    ;COUNT(CASE WHEN td.DeviceId = p_DeviceId2 THEN 1 END)

    BEGIN
    Open the cursor --
    ;OPEN test_cursor

    Loop through the cursor results --
    LOOP
    FETCH test_cursor INTO v_TestDate, v_Device1_TestCount,
    ;v_Device2_TestCount
    ;EXIT WHEN test_cursor%NOTFOUND

    Compare and print results when counts are equal --
    DBMS_OUTPUT.PUT_LINE('On ' || TO_CHAR(v_TestDate, 'YYYY-MM-DD') || ', '
    || p_DeviceId1 || ' had ' || v_Device1_TestCount || ' tests and ' || p_DeviceId2 || ' had '
    ;|| v_Device2_TestCount || ' tests.')
    ;END LOOP

    Close the cursor --
    ;CLOSE test_cursor

    EXCEPTION
    WHEN NO_DATA_FOUND THEN
    DBMS_OUTPUT.PUT_LINE('No common test dates found for ' || p_DeviceId1 || '
    ;and ' || p_DeviceId2)
    WHEN OTHERS THEN
    ;DBMS_OUTPUT.PUT_LINE('An error occurred: ' || SQLERRM)
    ;END FindSameTestDate

```

077

<input type="checkbox"/>	Variable	Type	Value
<input checked="" type="checkbox"/>	p_deviceid1	String	jTV718uPr846wIB933gWx760fAu549tVI320kFQ477sYI616eB
<input checked="" type="checkbox"/>	p_deviceid2	String	fEs595bQe471kGH987aPw743nYD230zMt625pUs867qGv166oK
<input checked="" type="checkbox"/>	*		

## פלט ההרצה:

```

On 2021-03-20, jTV718uPr846wIB933gWx760fAu549cVI320kFQ477sY1616eB had 0 tests and fEa595bQe471kG8987aPw743nYD230zM1625pUs867qOv166oK had 0 tests.
On 2021-04-26, jTV718uPr846wIB933gWx760fAu549cVI320kFQ477sY1616eB had 0 tests and fEa595bQe471kG8987aPw743nYD230zM1625pUs867qOv166oK had 0 tests.
On 2005-06-03, jTV718uPr846wIB933gWx760fAu549cVI320kFQ477sY1616eB had 0 tests and fEa595bQe471kG8987aPw743nYD230zM1625pUs867qOv166oK had 0 tests.
On 2008-04-25, jTV718uPr846wIB933gWx760fAu549cVI320kFQ477sY1616eB had 0 tests and fEa595bQe471kG8987aPw743nYD230zM1625pUs867qOv166oK had 0 tests.
On 2009-06-28, jTV718uPr846wIB933gWx760fAu549cVI320kFQ477sY1616eB had 0 tests and fEa595bQe471kG8987aPw743nYD230zM1625pUs867qOv166oK had 0 tests.
On 2022-07-10, jTV718uPr846wIB933gWx760fAu549cVI320kFQ477sY1616eB had 0 tests and fEa595bQe471kG8987aPw743nYD230zM1625pUs867qOv166oK had 0 tests.
On 2010-12-01, jTV718uPr846wIB933gWx760fAu549cVI320kFQ477sY1616eB had 0 tests and fEa595bQe471kG8987aPw743nYD230zM1625pUs867qOv166oK had 0 tests.
On 2013-03-19, jTV718uPr846wIB933gWx760fAu549cVI320kFQ477sY1616eB had 0 tests and fEa595bQe471kG8987aPw743nYD230zM1625pUs867qOv166oK had 0 tests.
On 2008-04-16, jTV718uPr846wIB933gWx760fAu549cVI320kFQ477sY1616eB had 0 tests and fEa595bQe471kG8987aPw743nYD230zM1625pUs867qOv166oK had 0 tests.
On 2020-11-14, jTV718uPr846wIB933gWx760fAu549cVI320kFQ477sY1616eB had 0 tests and fEa595bQe471kG8987aPw743nYD230zM1625pUs867qOv166oK had 0 tests.
On 2003-03-10, jTV718uPr846wIB933gWx760fAu549cVI320kFQ477sY1616eB had 0 tests and fEa595bQe471kG8987aPw743nYD230zM1625pUs867qOv166oK had 0 tests.
On 2002-09-04, jTV718uPr846wIB933gWx760fAu549cVI320kFQ477sY1616eB had 0 tests and fEa595bQe471kG8987aPw743nYD230zM1625pUs867qOv166oK had 0 tests.
On 2003-04-21, jTV718uPr846wIB933gWx760fAu549cVI320kFQ477sY1616eB had 0 tests and fEa595bQe471kG8987aPw743nYD230zM1625pUs867qOv166oK had 0 tests.
On 2006-12-07, jTV718uPr846wIB933gWx760fAu549cVI320kFQ477sY1616eB had 0 tests and fEa595bQe471kG8987aPw743nYD230zM1625pUs867qOv166oK had 0 tests.
On 3022-04-25, jTV718uPr846wIB933gWx760fAu549cVI320kFQ477sY1616eB had 0 tests and fEa595bQe471kG8987aPw743nYD230zM1625pUs867qOv166oK had 0 tests.
On 2017-07-21, jTV718uPr846wIB933gWx760fAu549cVI320kFQ477sY1616eB had 0 tests and fEa595bQe471kG8987aPw743nYD230zM1625pUs867qOv166oK had 0 tests.
On 2012-06-01, jTV718uPr846wIB933gWx760fAu549cVI320kFQ477sY1616eB had 0 tests and fEa595bQe471kG8987aPw743nYD230zM1625pUs867qOv166oK had 0 tests.

```

## Functions

1. פונקציה שמחזירה תז וכמות תרומות של אדם שתרם הכי הרבה תרומות דם בין שני תאריכים שניתנו כפרמטרים.

### הפונקציה:

```

) CREATE OR REPLACE FUNCTION mostDonations
    ,FromDate IN DATE
    ,ToDate IN DATE
    RETURN VARCHAR2 (
        IS
        ;(100)FunctionResult VARCHAR2
        ;MostDonationCount NUMBER
        ;(50)MostDonorID VARCHAR2
        BEGIN
        BEGIN
        SELECT DonorID, COUNT(DonationID) AS DonationCount
            INTO MostDonorID, MostDonationCount
            FROM Blood_Donation1
        WHERE DonationDate BETWEEN FromDate AND ToDate
            GROUP BY DonorID
            ORDER BY DonationCount DESC
        FETCH FIRST 1 ROWS ONLY; -- Use the correct Oracle syntax for fetching the
                                   first row

        ;FunctionResult := MostDonorID || ', ' || MostDonationCount
        EXCEPTION
        WHEN NO_DATA_FOUND THEN
        ;FunctionResult := 'No donations found in the given date range
        WHEN OTHERS THEN
        ;FunctionResult := 'An error occurred: ' || SQLERRM
        ;END
        ;RETURN FunctionResult
        ;END mostDonations
    
```

### התוצאה:

Variable	Type	Value
result	String	gTM888hFN991mRB268jBB036sEQ011bKu550gWZ591zEF796tF, 1
fromdate	Date	02/05/2060
todate	Date	02/05/2090

2. עבור מספר ימים שמתקבל, מחזירה את המכשיר הראשון שמאז תאריך התחזוקה האחרון שלו עברו יותר ימים.

### הפונקציה:

```

) CREATE OR REPLACE FUNCTION validateMaintenance
    AllowedPeriod IN NUMBER
    RETURN VARCHAR2 (
        IS
        CURSOR device_cursor IS
        SELECT DeviceId, LastMaintenanceDate
        ;FROM Device1

device_rec device_cursor%ROWTYPE;--for calculating dates
;e_OverdueMaintenance EXCEPTION
;(200)v_error_message VARCHAR2
;overdue_days NUMBER

BEGIN
;OPEN device_cursor

LOOP
;FETCH device_cursor INTO device_rec
;EXIT WHEN device_cursor%NOTFOUND

overdue_days := TRUNC(SYSDATE) -
;TRUNC(device_rec.LastMaintenanceDate)

Check if the device's last maintenance date exceeds the allowed period --
AllowedPeriod THEN < IF overdue_days
v_error_message := 'Device ' || device_rec.DeviceId || ' is overdue for
;'.maintenance by ' || (overdue_days - AllowedPeriod) || ' days
;RAISE e_OverdueMaintenance
;END IF
;END LOOP

;CLOSE device_cursor

;RETURN 'All devices are within the allowed maintenance period

EXCEPTION
WHEN e_OverdueMaintenance THEN
;RETURN v_error_message
WHEN OTHERS THEN
;RETURN 'An unexpected error occurred: ' || SQLERRM
;END validateMaintenance

```

### התוצאה:

Variable	Type	Value
result	String	Device ITi421nSk538sXu948vYs540vSI154FYF711aMt626hCN923tW is overdue for maintenance by 18 days.
allowedperiod	Float	10

## Mains

.1

התכנית:

```
CREATE OR REPLACE PROCEDURE MainProcedure
IS
    Parameters for FindSameTestDate --
    ;'v_DeviceId1 VARCHAR2(50) := 'D001
    ;'v_DeviceId2 VARCHAR2(50) := 'D002

    Parameters for validateMaintenance --
    v_AllowedPeriod NUMBER := 180; -- Example allowed period in days for
                                     maintenance
    ;(200)v_ValidationResult VARCHAR2

BEGIN
    Call the FindSameTestDate procedure --
    BEGIN
        )FindSameTestDate
        ,v_DeviceId1 <= p_DeviceId1
        v_DeviceId2 <= p_DeviceId2
        ;(
        EXCEPTION
        WHEN OTHERS THEN
    DBMS_OUTPUT.PUT_LINE('An error occurred while calling FindSameTestDate:
                           ;' || SQLERRM)
                           ;END

    Call the validateMaintenance function --
    BEGIN
        ;v_ValidationResult := validateMaintenance(v_AllowedPeriod)
    DBMS_OUTPUT.PUT_LINE('Result of validateMaintenance: ' ||
                           ;v_ValidationResult)
        EXCEPTION
        WHEN OTHERS THEN
    DBMS_OUTPUT.PUT_LINE('An error occurred while calling
                           ;validateMaintenance: ' || SQLERRM)
                           ;END

;END MainProcedure
```



## התכנית:

```

CREATE OR REPLACE PROCEDURE MainProcedure
IS
    v_FromDate DATE := TO_DATE('2024-01-01', 'YYYY-MM-DD'); -- Example start
                                                                date
Example end date -- ;v_ToDate DATE := TO_DATE('2024-12-31', 'YYYY-MM-DD')
                                                                ;(100)v_Result VARCHAR2

    Parameters for InsertNewDevice procedure --
        ;v_DeviceId VARCHAR2(50) := 'D001
        ;v_DeviceType NUMBER := 1
        ;v_SeriesNum NUMBER := 123
        ;v_VersionD NUMBER := 1
        ;v_Manufacturer VARCHAR2(50) := 'ManufacturerA
        ;v_PurchaseDate DATE := TO_DATE('2024-07-01', 'YYYY-MM-DD')
        ;v_LastMaintenanceDate DATE := TO_DATE('2024-07-01', 'YYYY-MM-DD')
        ;v_LocationD VARCHAR2(50) := 'LocationA
    BEGIN
        Call the mostDonations function --
        BEGIN
            ;v_Result := mostDonations(v_FromDate, v_ToDate)
            ;DBMS_OUTPUT.PUT_LINE('Result of mostDonations: ' || v_Result)
        EXCEPTION
            WHEN OTHERS THEN
                DBMS_OUTPUT.PUT_LINE('An error occurred while calling mostDonations: ' ||
                                                                ;SQLERRM)
                ;END

        Call the InsertNewDevice procedure --
        BEGIN
            )InsertNewDevice
            ,v_DeviceId <= p_DeviceId
            ,v_DeviceType <= p_DeviceType
            ,v_SeriesNum <= p_SeriesNum
            ,v_VersionD <= p_VersionD
            ,v_Manufacturer <= p_Manufacturer
            ,v_PurchaseDate <= p_PurchaseDate
            ,v_LastMaintenanceDate <= p_LastMaintenanceDate
            v_LocationD <= p_LocationD
            ;(
            EXCEPTION
            WHEN OTHERS THEN
                DBMS_OUTPUT.PUT_LINE('An error occurred while calling InsertNewDevice: '
                                                                ;|| SQLERRM)
                ;END
        END MainProcedure
    ;

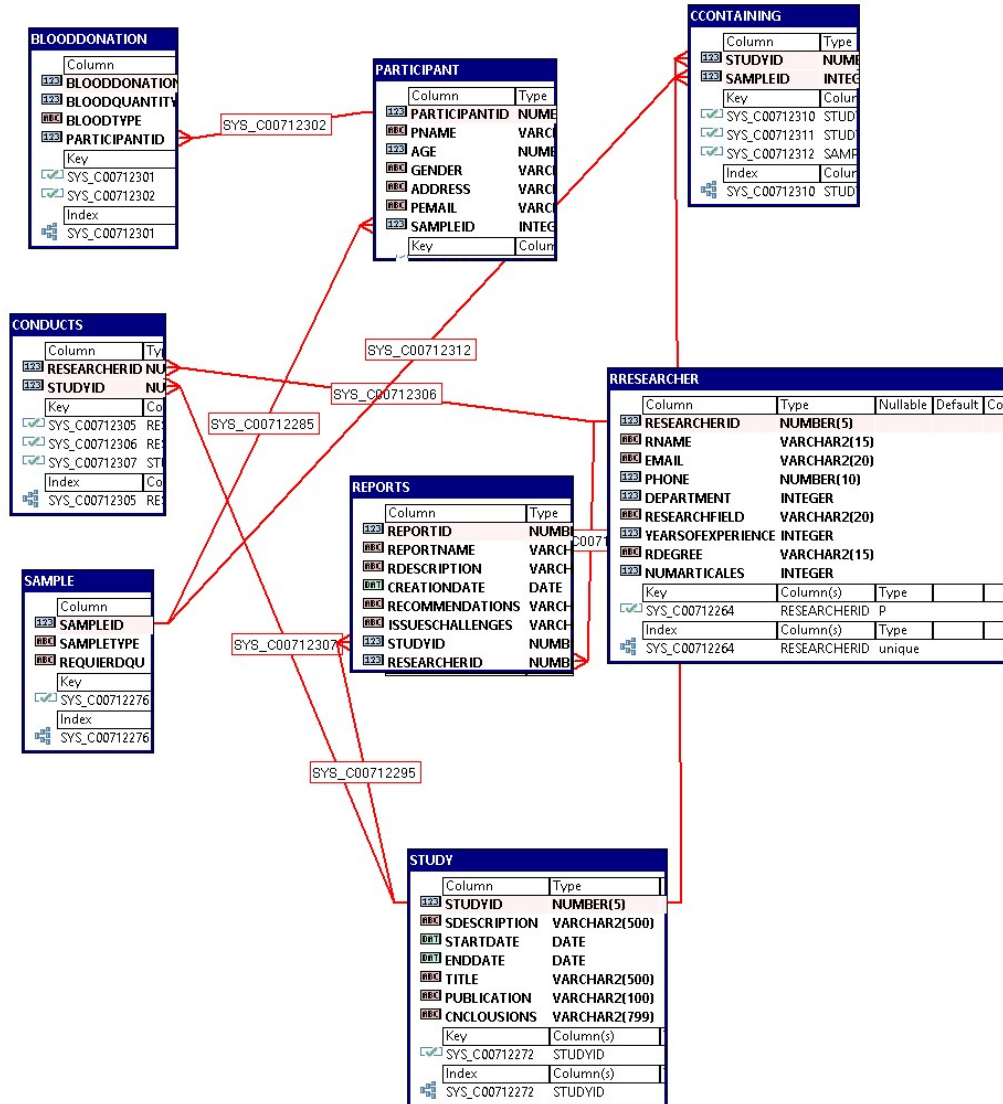
```

בסיס הנתונים לאחר הרצה:

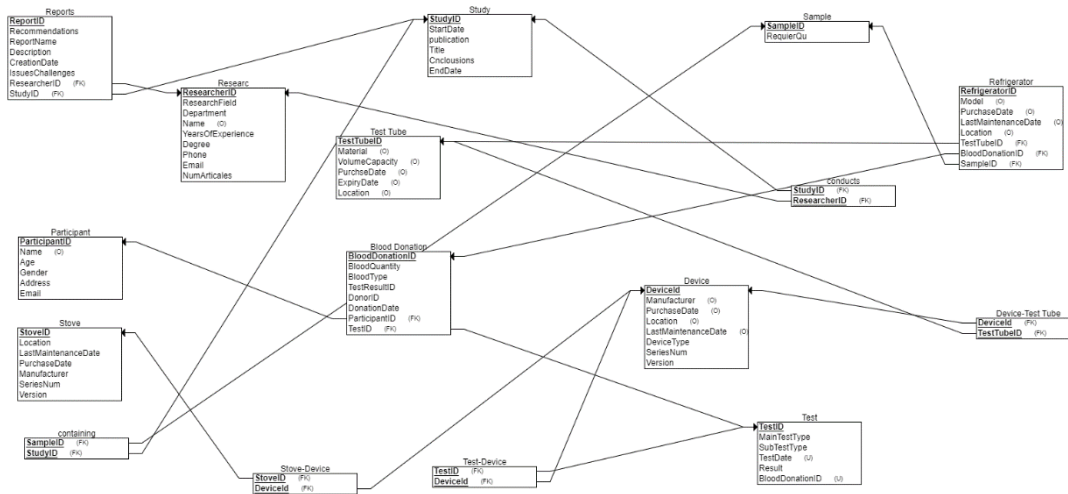
<

# אינטגרציה

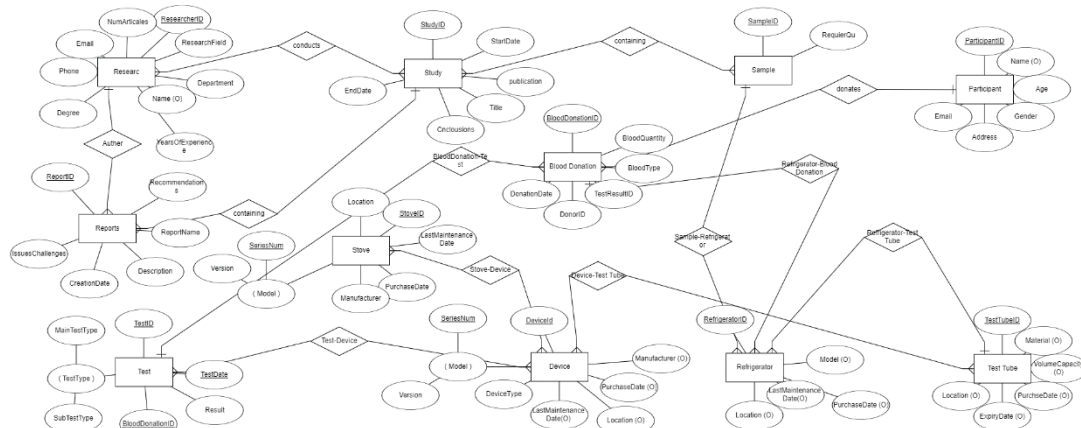
:Received DSD



## :DSD AFTER INTEGRATION



## :Integrated ERD



## החלטות בשלב האינטגרציה:

בעת השילוב בין שני ה ERD , קודם הכנסנו את הישויות שהיו שונות בשניהם. ואז עבור הישויות הזהות איחדנו בין התכונות. וכן במקרים שהיה מתאים להוסיף יחס בין טבלה שהייתה לטבלה חדשה אז הוספנו. כמו במקרה שהוספנו יחס בין SAMPLE ל REFRIGERATOR.

לאחר מכן, בשלב האינטגרציה התיכונתי בין הטבלאות, היה צורך לאחד רק בין BLOODDONATION לDONATION1\_BLOOD. מכיוון שרק ביניהם היה קשר משמעותי.

אז התחלנו בסידור העמודות שיהיו מאותו סוג ושם. ואז העברנו את הנתונים מהטבלה החדשה שקיבלנו לטבלה שהייתה בבסיס הנתונים. כמובן שעדכנו מפתח זר שהיה בטבלה שקיבלנו שיהיה קשור לטבלה הקיימת.

## Views

מבט 1 (אגף מקורי):

מקבץ פרטים הקשורים למכשיר מסוים. ת"ז שלו, מספר סידורי, מספר גרסא, ת"ז מבחנות הקשורות בו, הסוג שלהם, הכמות שמכילים, תאריך רכישה, תאריך תפוגה ומיקומם. גם את הטסטים שנעשו עליו, התאריכים שלהם והתוצאות.

```
CREATE VIEW Original11 AS
SELECT
    ,d.DeviceID
    ,d.SeriesNum
    ,d.VersionD AS Version
    ,d.LocationD AS Location
    ,tt.TestTubeID
    ,tt.Material
    ,tt.VolumeCapacity
    ,tt.PurchaseDate AS TestTubePurchaseDate
    ,tt.ExpiryDate AS TestTubeExpiryDate
    ,tt.LocationTestTube AS TestTubeLocation
    ,t.TestID
    ,t.TestDate
    t.ResultT AS TestResult
FROM
    Device1 d
    LEFT JOIN
    DeviceTest_Tube1 dt ON d.DeviceID = dt.DeviceID
    LEFT JOIN
    Test_Tube1 tt ON dt.TestTubeID = tt.TestTubeID
    LEFT JOIN
    Test_Device1 td ON d.DeviceID = td.DeviceID
    LEFT JOIN
    ;Test_1 t ON td.TestID = t.TestID
```

פלט:

DEVICEID	SERIESNUM	VERSION	LOCATION	TESTTUBEID	MATERIAL	VOLUMECAPACITY	TESTTUBEPURCHASEDATE	TEST
324	WyAh3n36uqLZu4GdVPQQ	292	7 USA	6DUlbatKmoEDy8NAg6mq	55	337	12/08/2008	25/1
325	WyAh3n36uqLZu4GdVPQQ	292	7 USA	6DUlbatKmoEDy8NAg6mq	55	337	12/08/2008	25/1
326	WyAh3n36uqLZu4GdVPQQ	292	7 USA	6DUlbatKmoEDy8NAg6mq	55	337	12/08/2008	25/1
327	IEapCITvF3WqZ1YQYwO	277	6 nU9nJnYZMfAmjggpYBC7	MBneLsLOVeanfmmcz2C	90	180	02/09/2014	05/0
328	YXa2DMSRtg4z53ObwO5H	195	3 gw2ZLNMX08TXaenQ34f	tih12Ox5RFRTJmMrZW	32	6	24/05/2002	20/0
329	YXa2DMSRtg4z53ObwO5H	195	3 gw2ZLNMX08TXaenQ34f	tih12Ox5RFRTJmMrZW	32	6	24/05/2002	20/0
330	YXa2DMSRtg4z53ObwO5H	195	3 gw2ZLNMX08TXaenQ34f	tih12Ox5RFRTJmMrZW	32	6	24/05/2002	20/0
331	58dZ4WYd09nejufCpd	710	2 BMEkhuFVMssddYLqOQD	Re0ESDrSbadw5633QVb	78	23	26/09/2009	19/0
332	DR9QLbpgWCunbpQbeMo7	413	5 NmvKWjgMk9Hq0mqjZ					
333	CIP1qgn4PLpASHRVV9I	147	9 RRebRPEYOhhILA6wofw	rDMIEQwzvOGLgAwmiBE9	59	42	14/08/2018	08/1
334	CIP1qgn4PLpASHRVV9I	147	9 RRebRPEYOhhILA6wofw	38pqacZggNZAgsmfZLo	87	266	26/04/2001	07/0

## שאלות על המבט:

1. מחזיר מכשירים שיש עליהם תוצאות טסטים, עם תאריך עשיית הטסט.

## השאלתא:

```
select DeviceId,TestDate,TestResult
from Original11
;where TestResult is not null
```

## הפלט:

	DEVICEID	TESTDATE	TESTRESULT
1	L9qe00I3L6whVkljVmwaw	04/08/2007	MuTMpPitWmnb9sExXTuy
2	L9qe00I3L6whVkljVmwaw	04/08/2007	MuTMpPitWmnb9sExXTuy
3	EyBzhXbzEJ8ppzNzzPVO	04/08/2007	MuTMpPitWmnb9sExXTuy
4	nQQ652xPO968mFp198IUX311uNi686bWb295bXp443tID949cN	24/08/2854 15:21:10	uKS573ajt810mTK088yOA790FTI268rNQ154ePp565rEd233cT
5	ktCL4nMRHmIDuZpTSJck	16/02/2005 08:21:07	fUq951hKj881bBE978bSM357iKF999xPe110bTt949nTa125mX
6	dAE913sUG017nJe415qHy431oSI847gCa027fEb288bMW562rV	06/02/1985 01:28:50	pVU923uU1826yAO991mDm954vPy596pDk215uGc314gTO410yT
7	nHi339aMy330iIC911kMt475IH321tTa123mLj385cEW844zC	25/03/1900 19:25:06	uZm370sUe43QZL398pEh448xOB645tGh386bWZ274aHK727nO
8	IB53Fh6I56fivpSIEQEy	25/11/2826 01:54:54	tFS875aEr879IPX312oOH829jIQ098mEo598x8a698kBS025iK
9	7nuqmAJj29MDPNk31Tsr	30/05/2033 23:33:38	cPd587Zc564jOz971oMS433sQF027eGv899vDR312qKi696zS

2. מחזיר את המכשירים שיש להם מבחנות שעבר להן התוקף.

## השאלתא:

```
SELECT
    ,DeviceId
    ,TestTubeID
    TestTubeExpiryDate
FROM
    Original11
WHERE
    ;SYSDATE > TestTubeExpiryDate
```

## הפלט:

	DEVICEID	TESTTUBEID	TESTTUBEEXPIRYDATE
1	j5c5IAX7JjRRUp7wwYea	cis3n5kwVLS2W2DICWPJ	19/04/2024
2	IMIRIPJ8h9zOy8w8DBri	Re0tE5DrSbadw5633QVb	19/04/2024
3	IMIRIPJ8h9zOy8w8DBri	Re0tE5DrSbadw5633QVb	19/04/2024
4	nMHhXVXG8lyobGKKFnba	Re0tE5DrSbadw5633QVb	19/04/2024
5	nMHhXVXG8lyobGKKFnba	Re0tE5DrSbadw5633QVb	19/04/2024
6	nMHhXVXG8lyobGKKFnba	Re0tE5DrSbadw5633QVb	19/04/2024
7	ombfWRm1sjlGOuObKz5K	48qfDwEqkIRsWyx9a17i	17/05/2024
8	qiEPmjrQzcVFi10mmOlj	LAFilaBVBHjEcWZ4J0B7	15/03/2024
9	qiEPmjrQzcVFi10mmOlj	LAFilaBVBHjEcWZ4J0B7	15/03/2024

## מבט 2 (אגף שהתקבל):

מקבץ פרטים הקשורים בחוקר מסוים. שמו, דרגתו, תז שלו, המחקר בו עוסק (פרטים על המחקר) וכן המשתתפים במחקר ופרטים עליהם.

```
CREATE VIEW Received AS
SELECT
    ,r.ResearcherID
    ,r.Department
    ,r.RName AS ResearcherName
    ,r.YearsOfExperience
    ,r.RDegree
    ,r.Phone
    ,r.Email
    ,s.StudyID
    ,s.StartDate
    ,s.publication
    ,s.Title
    ,s.Cnclousions
    ,s.EndDate
    ,p.ParticipantID
    ,p.PName AS ParticipantName
    ,p.Age
    ,p.Gender
    ,p.Address
    p.PEmail AS ParticipantEmail
FROM
    RRESEARCHER r
LEFT JOIN
    conducts c ON r.ResearcherID = c.ResearcherID
LEFT JOIN
    Study s ON c.StudyID = s.StudyID
LEFT JOIN
    CCONTAINING cn ON s.StudyID = cn.StudyID
LEFT JOIN
    Sample sm ON cn.SampleID = sm.SampleID
LEFT JOIN
    ;Participant p ON sm.SampleID = p.ParticipantID
```

## הפלט:

	RESEARCHERID	DEPARTMENT	RESEARCHERNAME	YEARSOFEXPERIENCE	RDEGREE	PHONE	EMAIL	STUDYID	STARTDATE	PUBLICATION	TITLE	CNCLOUSIONS	ENDDATE	PARTICIPANTID	PARTICI
1	116	5	RickyCoyote	15	Lecturer	13532820	ricky.coyote@veritek	---	---	---	---	---	---	---	---
2	117	5	HeathPuckett	8	Doctor	65308623	heathp@gateway.com	---	---	---	---	---	---	---	---
3	118	3	AnnChurch	7	Ph.D. Candidate	95123694	ann.church@pinnacles	---	---	---	---	---	---	---	---
4	119	5	JerryDalley	6	Ph.D. Candidate	5984884	jerry.dalley@aol.au	---	---	---	---	---	---	---	---
5	120	7	KylieGoldberg	9	Master	69065744	kylie.g@soltimevarne	---	---	---	---	---	---	---	---
6	121	2	SharonHoly	13	Assistant Profe	85528584	sholy@infovision.li	---	---	---	---	---	---	---	---
7	122	7	CrystalAllison	6	Master	50716923	crystal.allison@dps	---	---	---	---	---	---	---	---
8	123	4	RodneyDinise	6	Bachelor	29692030	rodney.s@networkdip	---	---	---	---	---	---	---	---
9	124	3	LarryParish	11	Lecturer	48942647	larry@vfi.de	---	---	---	---	---	---	---	---

## שאלות על המבט:

1. מחזיר את המספר החוקרים שלו ביצעו שום מחקר.

## השאלות:



```
(*)SELECT count
FROM
Received
WHERE
;NULL Title IS
```

הפלט:

	COUNT(*)
1	400

2.מחזיר את כל שמות החוקרים ממחלקה מסוימת.

השאילתא:

```
SELECT
ResearcherName
FROM
Received
WHERE
;Department = 5
```

הפלט:

	RESEARCHERNAME
1	LesleyNuman
2	BreckinViterell
3	FisherWills
4	BobbiMichael
5	HeathPuckett