

## **מעבדת תרומת דם**

מגישות:

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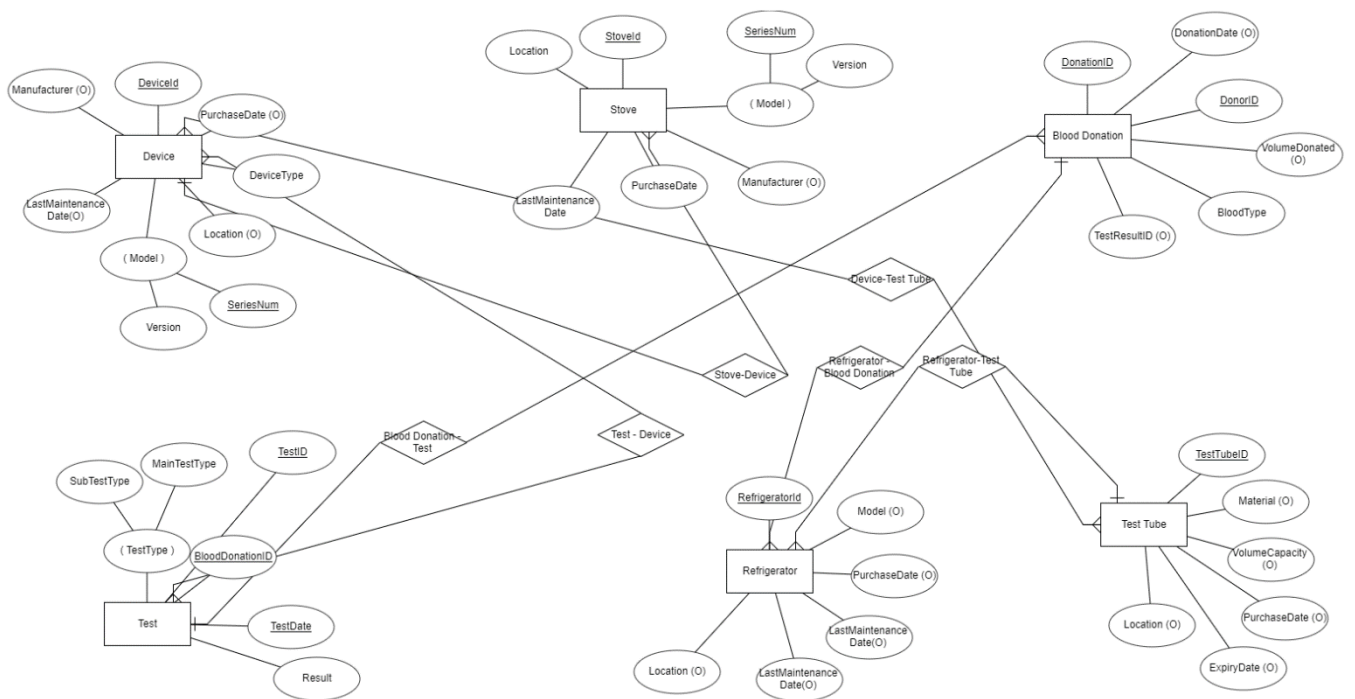
38..... Mains

## **תיאור מילולי:**

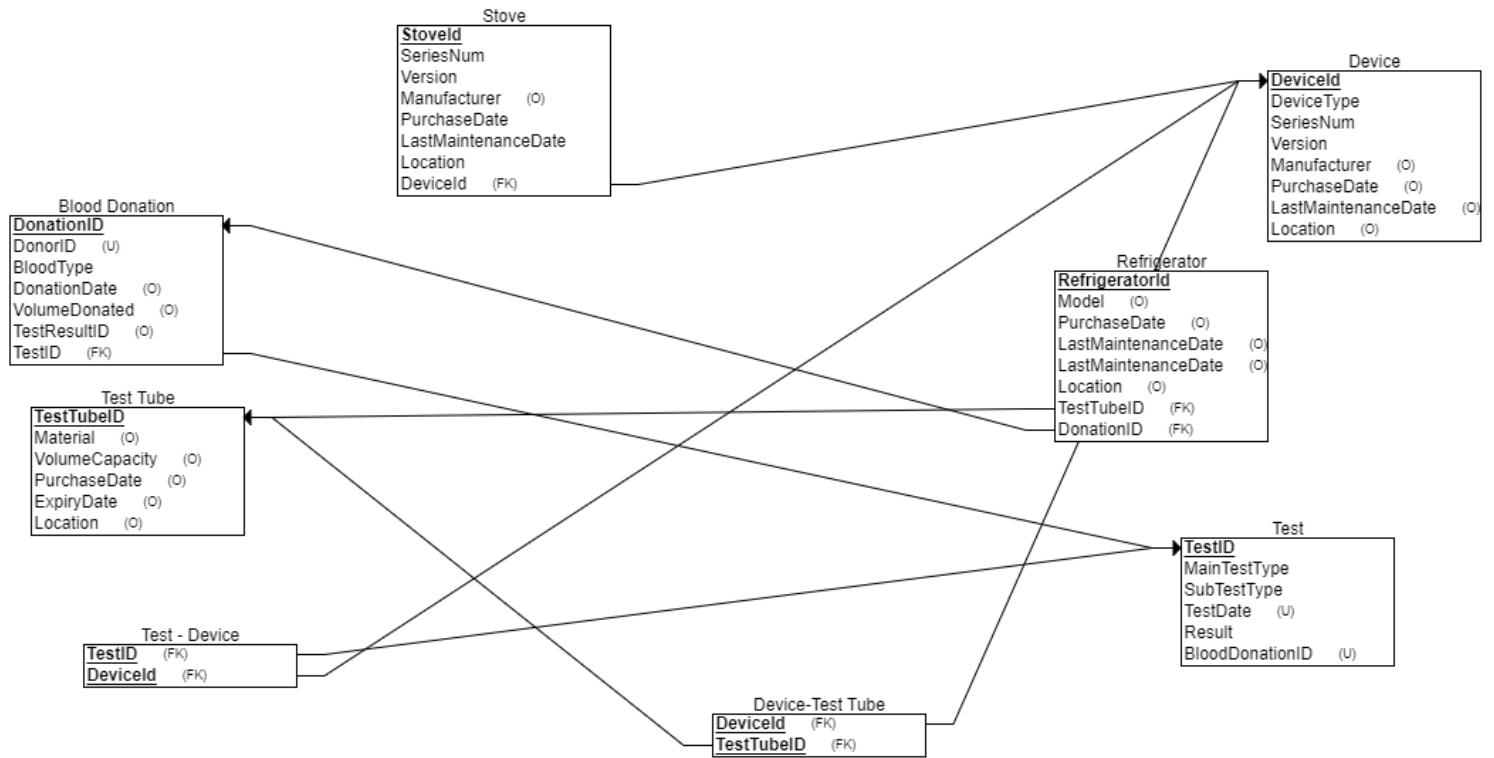
**שם המערכת:** מעבדת תרומות דם.

**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     // Example usage of the functions
32     string randomString = generateRandomString(10);
33     string randomDate = generateRandomDate(2000, 2023);
34     cout << "Random String: " << randomString << endl;
35     cout << "Random Date: " << randomDate << endl;
36     return 0;
37 }

```

\*על ידי קצבי exel

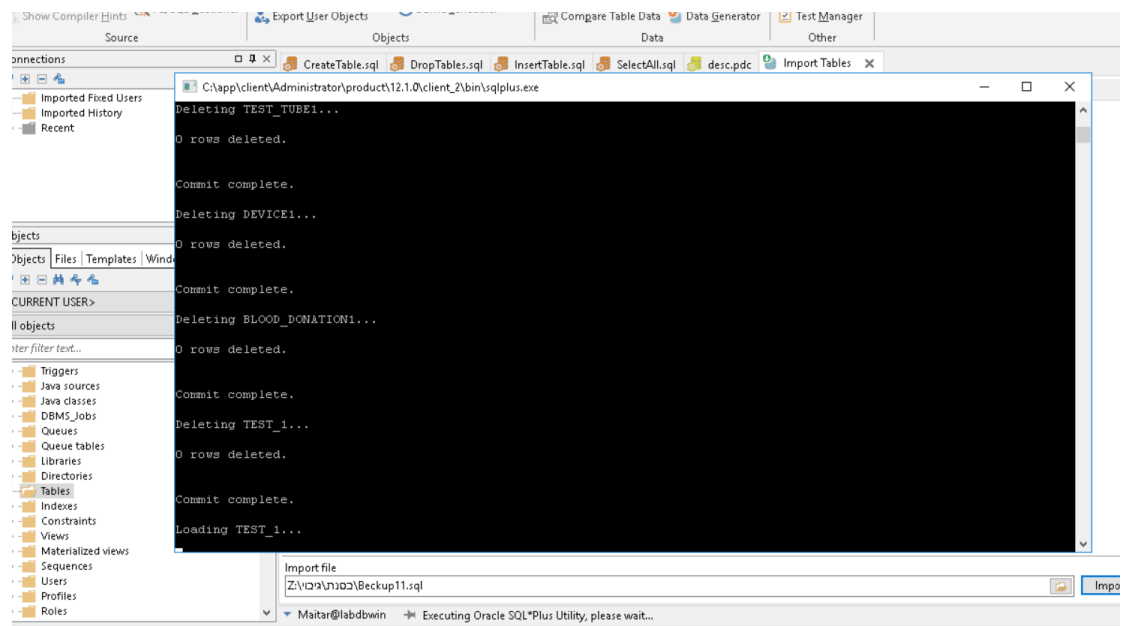
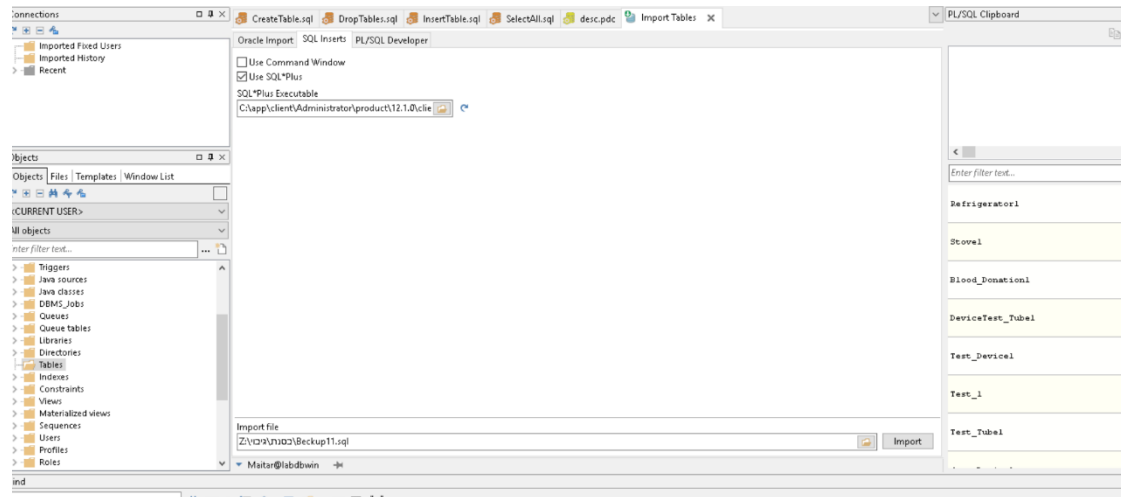
	A	B	C	D	E	F	G	H
1	StoveId	SeriesNum	VersionStov	Manufacture	PurchaseDa	LastMainter	LocationSto	DeviceId
2	OJ8Wfwytgs	174	6	u61GURC3Q	18/05/2012	13/08/2011	BoPRzd0Wq	3JwlU9dGEK
3	PhjEe2RBjeZ	558	4	DrP9PLdrDE	11/03/2000	26/02/2017	VutQ1URAbg	GJuUmCFHC
4	ucv1cbpZpG	450	6	ixWGvNwzjV	09/08/2021	30/05/2008	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	Eh2froCbIfP	467	8	AdEhesNB2f	15/12/2008	17/12/2018	egFJsZF4KM	oXmV4VXME
8	geg5hj1XtJO	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	kPJ6wn5HHf	iEvYsrJUPTxe
13	EB9ezF823d	79	2	mXOT9piWC	11/12/2009	08/11/2022	FxlaHGso114	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	Dt7CfR13ISQ
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	zraIB27hQng	MHRvIrODDb
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	IBOHfxfnSfgM	59	3	Y8f1XoK7d8	04/03/2014	13/12/2023	xG4dvyyiqR5	cD7b4H2mT
25	HPojJsJF6tVl	433	6	NxpUebcl3gC	10/07/2005	22/02/2018	sRXILJkockR	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	2	771	29	144 13/10/2208 17:50:21	10/11/2028 08:00
3	3	795	50	1459 13/01/2524 15:54:17	11/03/2303 16:00
4	4	1170	97	578 11/02/2100 19:43:23	17/10/2396 12:00
5	5	964	23	840 16/07/2793 03:49:23	23/01/2580 22:00
6	6	533	63	141 06/11/2494 07:04:48	28/05/2571 00:00
7	7	462	75	1795 27/02/2694 21:16:50	25/07/2224 07:00
8	8	973	2	957 06/01/2969 23:44:09	06/03/2707 04:00
9	9	755	79	1205 26/09/2303 15:20:52	25/03/2625 03:00
10	10	390	79	1952 26/09/3019 03:58:45	28/01/2805 10:00
11	11	37	9	1807 06/03/2428 05:25:52	26/05/2513 18:00
12	12	784	7	266 20/06/2276 09:10:13	18/06/2914 08:00
13	13	587	52	1238 04/09/2775 11:27:18	03/09/3018 03:00
14	14	618	25	1527 16/05/2119 03:02:00	12/06/2812 21:00
15	15	662	59	662 19/06/2203 23:27:27	11/09/1921 01:00
16	16	11	88	1965 19/10/2841 22:51:27	10/08/2428 01:00
17	17	447	89	2100 27/09/2379 03:16:42	15/07/2625 00:00
18	18	971	44	2030 28/09/2788 16:14:18	07/11/2224 15:00
19	19	133	35	1672 14/04/2381 14:46:01	21/10/2512 22:00
20	20	1217	6	1581 30/12/1954 11:54:23	13/06/3034 09:00
21	21	542	62	631 10/12/2624 02:09:01	04/09/2084 02:00

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

Enter filter text

Refrigerato

Stove1

Blood\_Donat

DeviceTest\_

Test\_Device

Test\_1

Test\_Tube1

## שאלות בחירה

1. שאלת 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	03waK1eR32NUsiv9OjMi	92	14UWhXP1Pjq7llyvniE	11/09/2006	QF4vzWICBdia6DMcZpVR	2
2	03waK1eR32NUsiv9OjMi	92	h9foIvppzH-HNVkrT5p	28/06/2009	suakQY7kSiUEvzyjeFTN	2
3	0o3lnEATBqky2vOiibhK	1	6dKTbnc00Ycrob45y5UK	21/10/2022	kjqlqmnrfgwep8bTRVvk	1
4	18D0bmQF0pT08L9pAb6P	79	nPK5Th5gZ0mVgftkox1	15/10/2008	lclN34GutRZKv1bSnUGqD	3
5	18D0bmQF0pT08L9pAb6P	79	flOzvnQH2JEfOZJ9Gnw	22/12/2008	P6w5yeh5pWenQXwlrpN	3
6	18D0bmQF0pT08L9pAb6P	79	6frCU4LsrnBgxfid0aU6	04/06/2021	J9wZvgMkrFD3dXlQ0r	3
7	1qMAFhgbPMb7p8U4ui	77	mtHjZDjwycCkorpQnUn	19/04/2006	EDFgl0BcqfK5jnj3pvh	2
8	1qMAFhgbPMb7p8U4ui	77	lsmhwpSX9dYfY35YR0pN	03/10/2017	c8rpNLt8QD6Ma6YmcNCR	2
9	1ruLrYJRcafbCpdmM5g	70	bxycyq39EioMvvggEWhf	30/12/2008	cwOpHdfpwbdlHVQDTxgUV	1
10	2FpJ0uEU3OmP8g3MBHw	72	8MuA9PvaygrCMMyE6Uj	01/01/2004	B0V9fOpQic6GZPFdfk	2
11	2K7n76Ei17Dnm8BxcmMBHw	72	8u7GEmO5A0T3w15APZC1	10/06/2013	f2V7Ttw6K9d47M5CshenYen	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	IQP517uKd623aAh723z1u112hZa896ePQ566Vl266TM859kY	14/09/2063 13:11:51	4OUA7mOj8k4kzZg7qJMb	-379575
4	pCH788oYP298qYH477xG075yAg245cR021uOO289kH355aU	04/02/2063 02:23:16	uutUhhwCRv9kel3b8lM	-379953
5	dk954Iu17xOY223Oj979wFO59k4DZ715zZi24QyOC924tJ	16/07/2046 13:58:56	v3v660gFN851uUX976gRd424mRz514yfN667dKM190bPH717u	-373207
6	yPv451Rj783qWA043vT1894fRX628hZD942cDm689vVR194pZ	04/04/2043 06:27:21	lDHAg6c7y60HfFDPkF6w	-372107
7	fMR884u0169pWt669pMd067yAk381yEn237pIA153vOv524uJ	25/02/2017 20:31:20	ynmu5W3yKulttOPNHFqS	-362574
8	fN3276Yv065yBC571Lh310qYv643FLa766FE860Ys765mW	01/06/2013 08:02:49	8xCSO25Mk178yNM8fZud	-361208
9	uCU540Qe733oNz365IV039cCQ015WZ743Nm616gVv438fG	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 המיקום ומחשבת את מספר הימים שותרו 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	a0O448Dv4311d4q340:8b299nH1692Oh777h4c768jU959pE	LR1628Gv914xGL988HV085pHj158DA611tHY3778EP
2   BC099FR899CT332gLB97zeAm4265m136u8B027c5u913uR	USA	07/03/1922 22:44:24	vPU1748fIN428pIQ213uSP415FZJ154nYg9791c278kYE714nQ	zBQ164vY629wP1264AI712w9W971qX0191jNp062pAZ
3   t7r554Gv216oKu740yVL189vYU987qBL390ZC0820mY570eR	Italy	07/10/2016 10:59:13	gWY265yMj670aTw240nQH799pIn667nTy491wRf687nPr968uN	xBL257JLT561mE:043yDL265Zg042uZw597RvX983Uj59
4   t7r554Gv216oKu740yVL189vYU987qBL390ZC0820mY570eR	Italy	07/10/2016 10:59:13	wfU802cG:921aMG254eLUX5458m777Cb794Vz915kTb016eB	fFU1548f782cVZ477kCF984yOP539wKQ935PfC465nPB
5   X3YnVa9z96uU95jnSzi	ChZefNOmorPX0nkDz8VA	15/02/2024	DDytpbp93GLite8YKVF	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	dk7GxRPa0LLsAi7kzNw4	...	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	kOoE53yAvrvNokKfoZ	21/07/2022	14/02/2022	ZD0oIkOCpUln38j3TNS
7	97	566	0	4yz29FkoMl3yOo5LkO	02/01/2017	07/06/2021	T2L8toOv80V7uBClBz4k
8	72	454	9	M6EHEDvYBTeE8NlJNGI	15/12/2003	16/06/2009	nKlKSoHl1FISl79woA8b
9	81	945	5	jqzW204LWuG9yZOKICIdS	20/10/2014	17/06/2013	wzhwN0gCbvLV5AashXz1
10	92	982	1	jczdVIMgtOWi1bPOF0Pe	24/08/2005	22/09/2000	Jr4ACbfnLDAmlea6aEx2
11	56	975	7	wunWfIkIBHR7kOOZMg	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	hUs798vZ798vH677aOV714S1927Z3823Ao011bAw954dQ	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	Kxg830QfW951BK742jGQ342iNQT798uQJ746vY890bC492CZ	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	jFC556eOK925dER039Nk433jST953jGn492oG4647cPE254v	21/05/2743 15:24:11	30/09/2502 1
9	66	8	0	sSH424gUq132wUG496Uj348vA935pEx625jYM044zNT665gl	07/09/2076 13:19:12	02/01/2924 1
10	31	321	9	jCt065zAR128RH044Lj492gCj367dM5737uOU624ePM818gG	05/02/2416 17:18:57	14/07/2199 0
11	25	449	6	xPK398Z0413zDc384fU740dfg685hDR395bQJ757bSH971eE	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	oB1574iOV251kU587kV868LL180bOh258vOT021bSR950mF	21/07/2478 21:12:57	06/05/2709 1

אחרי:

DEVICETYPE	SERIENUM	VERSIOND	MANUFACTURER	PURCHASEDATE	LASTMAINTENANCEDATE	LOCATIOND
1	20	81	1	vZv143e167aVU113dJU824mF5241vCw492mBH222gUL172hD	21/05/2549 05:04:42	USA
2	34	863	0	rTg078aUk934kAp638Sh449wDZ455gHg590rAq535Fen614gL	04/09/2150 08:56:15	USA
3	78	332	9	sXs540eQf672nRK937pYY460Xa218mOP520KxS472vV998nO	20/11/2443 00:01:35	USA
4	31	321	9	jCt065zAR128RH044Lj492gCj367dM5737uOU624ePM818gG	05/02/2416 17:18:57	USA
5	25	449	6	xPK398Z0413zDc384fU740dfg685hDR395bQJ757bSH971eE	24/02/2391 11:10:45	USA
6	51	995	1	zKx887eUj438O1880kLw086uOy814Fxe691nUg956dPz962rB	18/03/2620 14:25:35	USA
7	14	661	8	oB1574iOV251kU587kV868LL180bOh258vOT021bSR950mF	21/07/2478 21:12:57	USA
8	21	29	2	nWJ962dPm63DyFr164AX262oEZ615xXE186Ep51jVWV753mN	10/07/2535 18:48:31	USA
9	17	397	9	rVv457ITTH692y1z117cTz855dV137wVY331mPK786cRX572d8	16/05/2147 23:37:06	USA
10	41	656	5	aVe877gPR619dFe031kY330oGq764pK622FQ141ITA355cQ	12/04/2394 19:16:01	USA
11	4	260	8	pSu2341St645tOU250jKc696fBD682dSH778vOC127kV1887O	21/11/2549 12:41:19	USA
12	5	877	6	wRO572aMn430vY560dLr762Zzh364vVo827mMt6280U1255uL	11/10/2989 08:07:35	USA
13	85	144	8	fRI152rDs167jLq460Vq652nLy639A3368YO649nD1983tG	02/10/2476 03:21:53	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	nPKgAZXTkuqY0sZelUaa	FXZHDrRShj7JUnSGap0g	19/05/2022	328	qXqgO8eBYfoMySvKQR4	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	evFPXla5S0Tntc3wQA6	81	356	0 gNLtYjAjraE1Dblma50s	19/08/2007	11/09/2014
5	grtD2XQAJgTZPtc6gRn	49	975	0 iVe9yIsXh2Pg3MQOKN4N	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	aRq239bWc744lPX032vYt722mOK220mGs743jPz879bDi791rD	34	863	0 rTg078aUk934kAp63jSh449wOZ455gHg590Aq535fen614gL	04/09/2150 08:56:15	16/06/2024 15:4
9	xMi989cSB761sHg465cAE340LD332yAw971gGR536aPz095oX	19	790	0 kXq030oRw951tBK742cGQ342tNQ738uQ1744kVY890aBC492cZ	11/10/2216 09:23:28	24/01/2614 23:2
10	zUZ677LRK714RF180BX55QEI057hBU879cZY687eET829cT	66	8	0 sSH424gUq132wUg496lUj348vAA955pEz625iYM044ztNT665gl	07/09/2076 13:19:12	02/01/2924 13:C
11	vFn171oTa222mWz244SY389cKD418pHr169qW0076ZV082xT	75	457	0 tMb596vWF817kQW323KL0976oJb750pCP498lIN124dD:117JW	03/07/2786 10:56:38	16/06/2024 15:4
12	zBy324vQv417INy039YD886cVz156dER439wDx334zSZ994bX	67	815	0 kGX890vZ0971jpc557oRc283dL398sDE189cOo314nCV131rD	02/12/2013 08:02:41	09/03/2047 03:4
13	uIZ657jPN064fP869wEL643nVr345vMH131vGI012rC5458pN	6	974	0 kZM931mUP572qZB190nlq178mLa824mFT264wNy245dWj287sW	15/10/2927 20:42:34	03/01/2657 11:1
14	vOQ374kKp447c50261kCr298qQm140vO017aYb179bDG870XS	25	598	0 uYJ128vSA335hHs482nZB658qNg627uY913bLV546vAr763wL	01/05/2481 12:05:36	30/12/2873 09:3

אחרי:

```

SELECT * from Device1
WHERE VersionD =0;

```

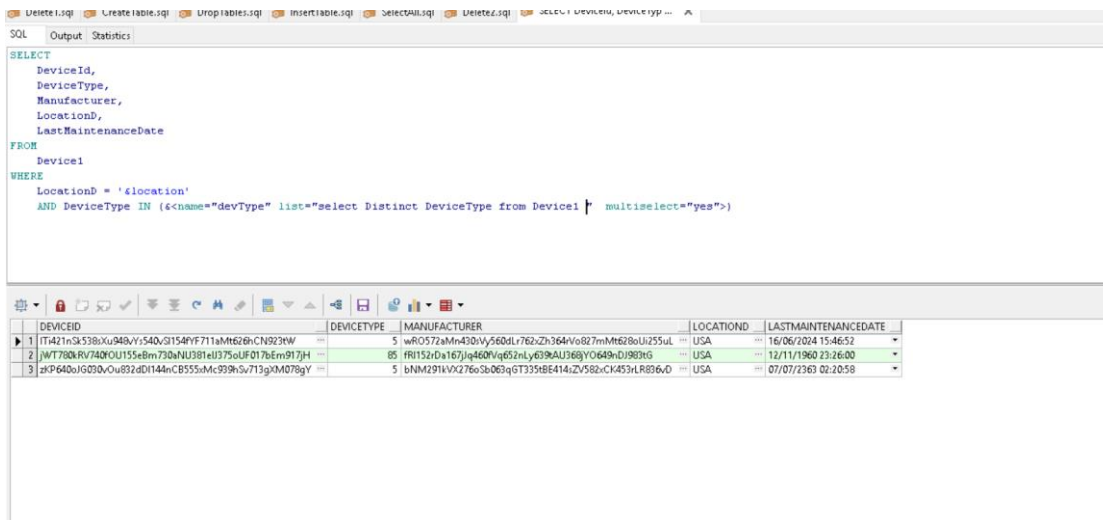
DEVID	DEVICETYPE	SERIESNUM	VERSIOND	MANUFACTURER	PURCHASEDATE	LASTMAINTENANCE	LOCATIOND
-------	------------	-----------	----------	--------------	--------------	-----------------	-----------

## 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 pane displays a SQL query, and the bottom pane 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">)
```

**Query Results:**

	DEVICEID	DEVICETYPE	MANUFACTURER	LOCATIOND	LASTMAINTENANCEDATE
1	IT421nS4538XU949VY540VG154FYF711aMt626hCN9234W	5	wRO572aMn430bVv560dLr762zZh364V0827mM628oUj255uL	USA	16/06/2024 15:46:52
2	JWT780kRV740OU155eBm730aUJ381eUJ375oUF017bEm917jH	85	fR152rDa167jng460Nvg652nLy639AU368YO649hDj983tG	USA	12/11/1960 23:26:00
3	zKp640uIG030vOu892d0144nCB555uMc939hSv713gXm078gY	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:

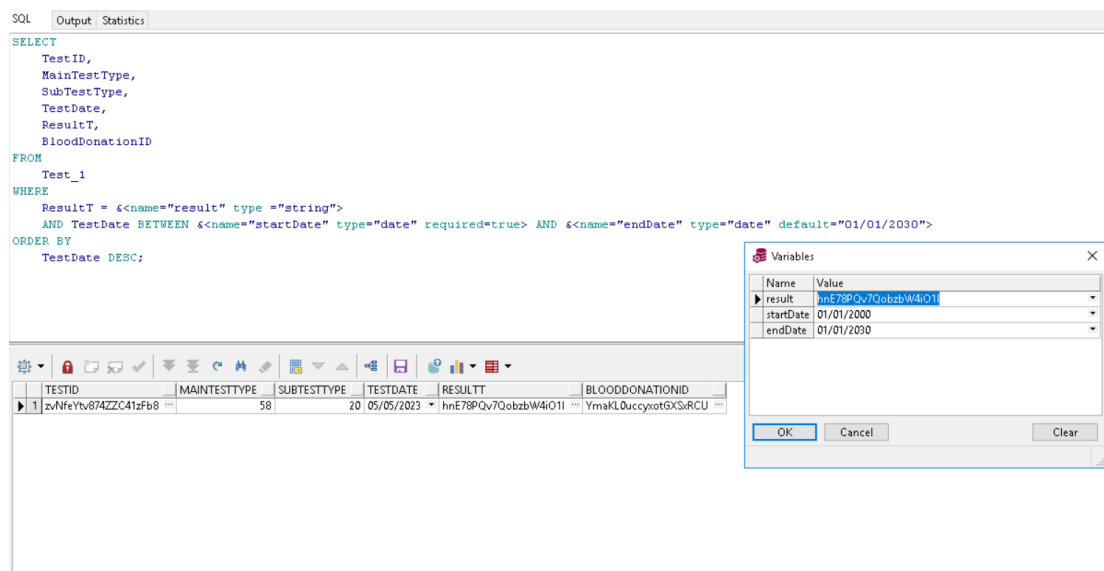
Name	Value
volumeCapacity	120
Expdate	01/01/2030

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	FsiY90/VKToZtgEnGCao	40	493 26/06/2014	eX8q749ZIHhtMMIDSLP7
4	Vfszel8FequQllp0uLKg	91	493 25/04/2009	WVP2YygWnSjNGUAArObf
5	Vhh703ztIp1tZ7GoZbWx	37	491 12/10/2024	HkoPkerdANrHxUBECuA
6	IgEzW2nTs8uUsYpC2tDe	82	491 21/09/2029	ciRDbfMZWW1Jee8yYEA
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

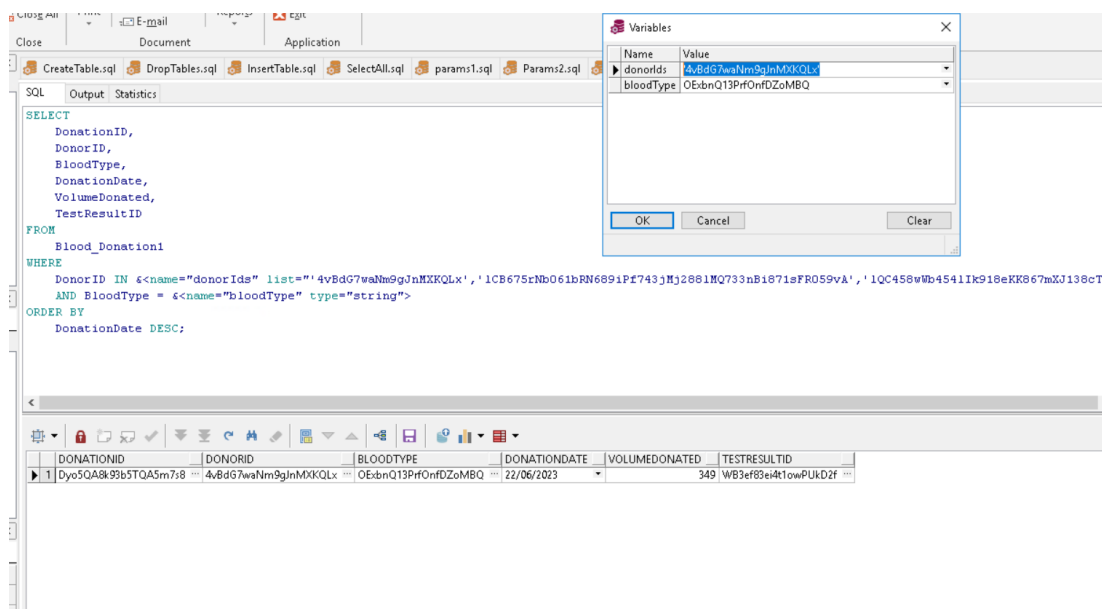
3. מחזיר פרטי טסט עבור תוצאה שהתקבלה ושנמצא בין 2 תאריכים שהוקשו. התאריך סיום הינו אופציונלי.

```
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;
```

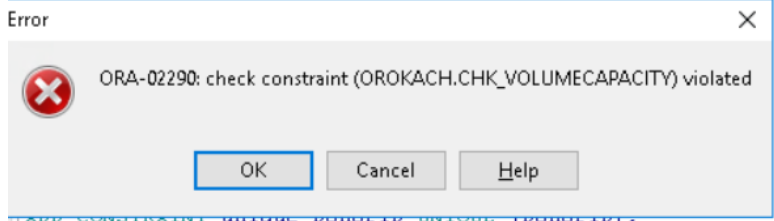


## אילוצים

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

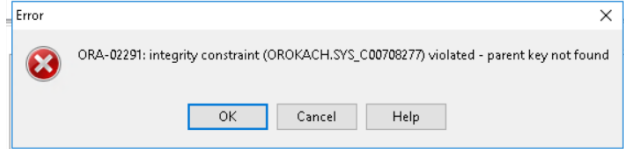
OK Cancel Help

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

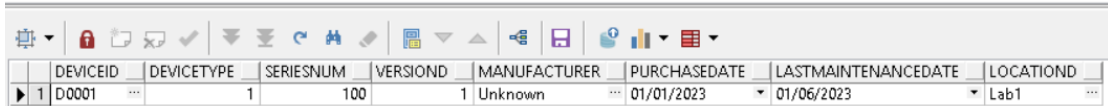
OK Cancel Help

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	...

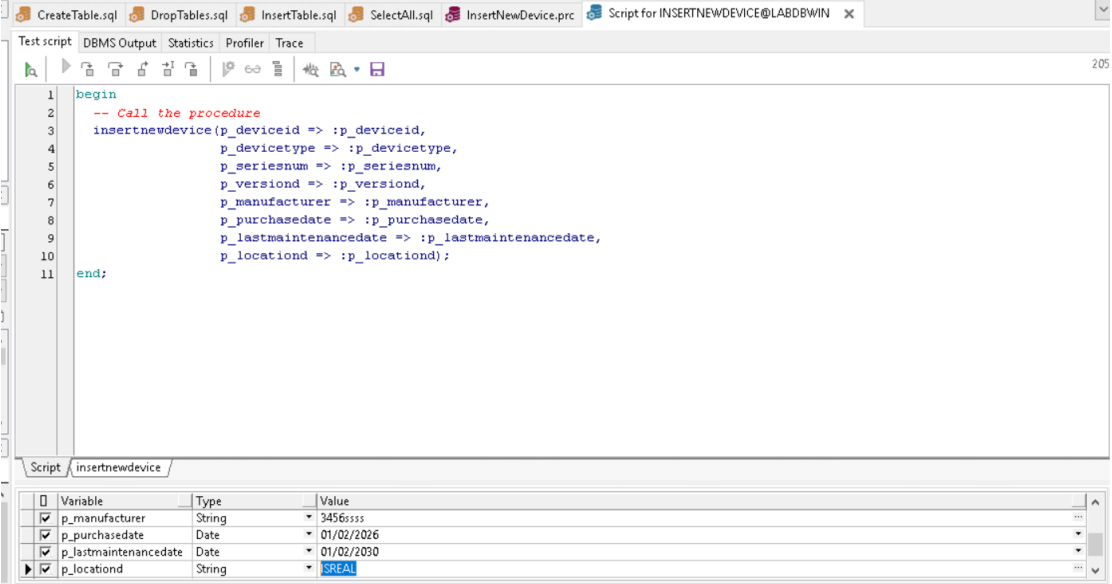
## Procedures

1. הוספת מכשיר חדש לבסיס הנתונים.

```
create or replace procedure InsertNewDevice(p_DeviceId in VARCHAR2,  
      p_DeviceType in number, p_SeriesNum IN NUMBER,  
  
      p_VersionD IN NUMBER,  
  
      p_Manufacturer IN VARCHAR2,  
  
      p_PurchaseDate IN DATE,  
  
      p_LastMaintenanceDate IN DATE,  
  
      p_LocationD IN VARCHAR2) is  
  
      begin  
  
      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 OTHERS THEN  
  
      DBMS_OUTPUT.PUT_LINE('An error occurred: ' || SQLERRM);  
  
      ROLLBACK;  
  
      end InsertNewDevice;
```

הכנסת הנתונים:

7



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Variable	Type	Value
p_manufacturer	String	3456ssss
p_purchaseDate	Date	01/02/2026
p_lastmaintenancedate	Date	01/02/2030
p_locationd	String	SREAL



לאחר הרצה:

```
select * from Device1
where LocationD = 'ISREAL'
;
```

	DEVICEID	DEVICETYPE	SERIESNUM	VERSIOND	MANUFACTURER	PURCHASEDATE	LASTMAINTENANCEDATE	LOCATIOND			
▶ 1	1234	***	3	4	2	3456ssss	***	01/02/2026	01/02/2030	ISREAL	***

2. עדכון מיקום מכשיר לפי id שהוזן.

```
create or replace procedure UpdateDeviceLocation(p_DeviceId IN VARCHAR2,
p_NewLocationD IN VARCHAR2
```

```
is (
```

```
begin
```

```
    UPDATE Device1
```

```
    SET LocationD = p_NewLocationD
```

```
    ;WHERE DeviceId = p_DeviceId
```

```
    IF SQL%ROWCOUNT = 0 THEN
```

```
        ;DBMS_OUTPUT.PUT_LINE('No device found with the given DeviceId.')
```

```
    ELSE
```

```
        ;DBMS_OUTPUT.PUT_LINE('Device location updated successfully.')
```

```
    ;END IF
```

```
    ;COMMIT
```

```
    EXCEPTION
```

```
    WHEN OTHERS THEN
```

```
        ;DBMS_OUTPUT.PUT_LINE('An error occurred: ' || SQLERRM)
```

;ROLLBACK

;end UpdateDeviceLocation

נעשה שימוש בטריגר:

create or replace trigger trg\_UpdateDeviceLocation

after update

on device1

for each row

declare

local variables here --

begin

NEW.LocationD THEN: <> IF :OLD.LocationD

DBMS\_OUTPUT.PUT\_LINE('DeviceId: ' || :OLD.DeviceId || ' Location

;updated from ' || :OLD.LocationD || ' to ' || :NEW.LocationD)

;END IF

;end trg\_UpdateDeviceLocation

לפני עידכון:

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

from Blood_Donation1
here    DonationDate < ADD_MONTHS(SYSDATE, -24);

from Device1
here    LastMaintenanceDate > SYSDATE

from Device1
here    LocationD = 'ISREAL'
```

CEID	DEVICETYPE	SERIESNUM	VERSIOND	MANUFACTURER	PURCHASEDATE	LASTMAINTENANCEDATE	LOCATION
754nUe798gND412tZa350bOJ939oAe679hWR072vWVL482eH	78	332	9	sXs540eQf672nRK937pYY460rXe218mQP520fXS472rVa998nO	20/11/2443 00:01:35	15/03/2269 21:19:09	USA

## לאחר עידכון:

```

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;

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

select * from Device1
where LastMaintenanceDate > SYSDATE
;
select * from Device1
where LocationD ='ISREAL'
;

```

	DEVICEID	DEVICETYPE	SERIESNUM	VERSIOND	MANUFACTURER	PURCHASEDATE	LASTMAINTENANCEDATE	LOCAT
1	nHp754nUe798gND412tZa350bOJ939oAe679hWRO72vWL482eH	78	332	9	zX:540eQf672nRK937pYY460Xe218mQP520FKS472rVa998nO	20/11/2443 00:01:35	15/03/2269 21:19:09	ISRAEL

## פלט ההרצה:

```

DeviceId: nHp754nUe798gND412tZa350bOJ939oAe679hWRO72vWL482eH Location updated from USA to ISRAEL
Device location updated successfully.

```

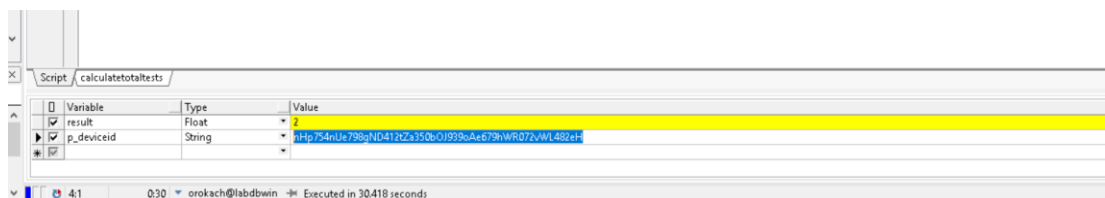
## Functions

1. פונקציה שמחזירה כמה טסטים התבצעו עבור מכשיר מסוים-שמתקבל כפרמטר.

### הפונקציה:

```
create or replace function CalculateTotalTests(p_DeviceId IN VARCHAR2) return
number
IS
;v_TotalTests NUMBER := 0
    CURSOR c_Tests IS
SELECT COUNT(*) AS total_tests
    FROM Test_Device1
;WHERE DeviceId = p_DeviceId
    BEGIN
        ;OPEN c_Tests
;FETCH c_Tests INTO v_TotalTests
        ;CLOSE c_Tests
;RETURN v_TotalTests
    EXCEPTION
        WHEN OTHERS THEN
;DBMS_OUTPUT.PUT_LINE('An error occurred: ' || SQLERRM)
        ;RETURN 0
;END CalculateTotalTests
```

### התוצאה:



Variable	Type	Value
result	Float	2
p_deviceid	String	11P174nUe738gND41zCz35Qe0I939cAe073nWn072vVL402eh

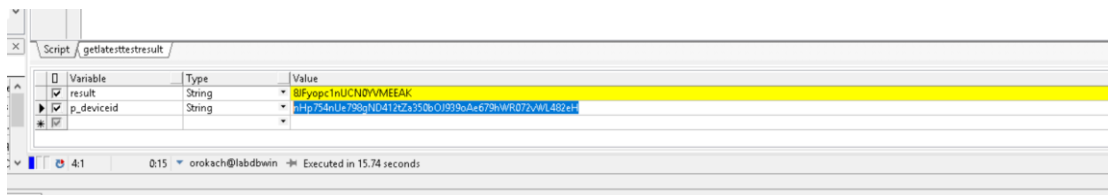
2. מחזיר את הטסט האחרון שהתבצע עבור מכשיר מסוים.

### הפונקציה:

```
create or replace function GetLatestTestResult(p_DeviceId IN VARCHAR2) return
    varchar2
    IS
    ;(100)v_TestResult VARCHAR2
    BEGIN
    SELECT t.ResultT INTO v_TestResult
    FROM Test_1 t
    JOIN Test_Device1 td ON t.TestID = td.TestID
    WHERE td.DeviceId = p_DeviceId
    ORDER BY t.TestDate DESC
    ;FETCH FIRST 1 ROWS ONLY

    ;RETURN v_TestResult
    EXCEPTION
    WHEN NO_DATA_FOUND THEN
    ;'RETURN 'No test results found
    WHEN OTHERS THEN
    ;DBMS_OUTPUT.PUT_LINE('An error occurred: ' || SQLERRM)
    ;'RETURN 'Error
    END GetLatestTestResult
```

### התוצאה:



The screenshot shows a SQL script execution window with the following table:

Variable	Type	Value
result	String	8Fyepc1nUCN0VMEEAK
p_deviceid	String	8Hp754nUe798gND412cZs350bOj939cAe679hWR07zVWl48zt

Below the table, the execution status is shown: 0:15 orokach@labdbwin Executed in 15.74 seconds.

## Mains

.1

התכנית:

```
DECLARE
;v_DeviceId VARCHAR2(20) := 'DEV12345
;v_TotalTests NUMBER
BEGIN
    Call function to calculate total tests --
;v_TotalTests := CalculateTotalTests(v_DeviceId)
DBMS_OUTPUT.PUT_LINE('Total Tests for Device ' || v_DeviceId || ': ' ||
;v_TotalTests)

    Call procedure to insert new device --
InsertNewDevice('DEV54321', 1, 123, 1, 'Test Manufacturer', SYSDATE,
;SYSDATE, 'Test Location')
;END
```

פלט:

SQL Output Statistics

Clear Buffer size 10000 ☒ Enabled

---

Total Tests for Device DEV12345: 0

An error occurred: ORA-00001: unique constraint (OROK&CH.SYS\_C00708249) violated

|

.2

## התכנית:

```
DECLARE
    v_DeviceId VARCHAR2(50) :=
;'"mGq097xGi939hWE558nYq336rQK762eYR713xIp127wVG867pL
;(100)v_LatestTestResult VARCHAR2
BEGIN
    Call function to get the latest test result --
;v_LatestTestResult := GetLatestTestResult(v_DeviceId)
DBMS_OUTPUT.PUT_LINE('Latest Test Result for Device ' || v_DeviceId || ': ' ||
;v_LatestTestResult)

    Call procedure to update device location --
;UpdateDeviceLocation(v_DeviceId, 'New Test Location')
;END
```

## בסיס הנתונים לפני הרצה:

bLQ838TL521vH76QF663cQA692vYM448Zx135ylo874H	56	303	10	z6E467oSV394hYm512pxu069MT893qUj665pL948W087eQ	17/06/2046 02:10:45	17/04/2561 10:02:29	Netherlands
mGq097xGi939hWE558nYq336rQK762eYR713xIp127wVG867pL	54	196	1	I2144LW797cEY673hB076gZk639gQ5596dSP041jME21zQ	16/03/2160 18:44:12	01/09/2037 06:18:51	Germany

## בסיס הנתונים לאחר הרצה:

```
SELECT * from Device1
WHERE DEVICEID = 'mGq097xGi939hWE558nYq336rQK762eYR713xIp127wVG867pL';
```

DEVICEID	DEVICETYPE	SERIEUNUM	VERSIOND	MANUFACTURER	PURCHASEDATE	LASTMAINTENANCEDATE	LOCATIOND
mGq097xGi939hWE558nYq336rQK762eYR713xIp127wVG867pL	54	196	1	I2144LW797cEY673hB076gZk639gQ5596dSP041jME21zQ	16/03/2160 18:44:12	01/09/2037 06:18:51	New Test Location

## פלט:

CreateTable.sql DropTables.sql InsertTable.sql SelectAll.sql GetLatestTestResult.fnc Script for GETLATESTTESTRESULT@LABDBWIN main1.sql utLLAKE v\_DeviceId

SQL Output Statistics

Clear Buffer size 10000 ☒ Enabled

Latest Test Result for Device mGq097xGi939hWE558nYq336rQK762eYR713xIp127wVG867pL: No test results found  
DeviceId: mGq097xGi939hWE558nYq336rQK762eYR713xIp127wVG867pL Location updated from Germany to New Test Location  
Device location updated successfully.