

חישוב יתרה ממוצעת של כל החשבונות בסניף

הפונקציה תחזיר את היתרה הממוצעת של כל החשבונות בסניף מסוים.

```
get_average_balance_by_branch

1 CREATE OR REPLACE FUNCTION get_average_balance_by_branch (p_branch_id NUMERIC)
2 RETURN NUMBER
3 IS
4   v_total_balance NUMBER := 0;
5   v_account_count NUMBER := 0;
6   v_balance NUMBER;
7   v_average_balance NUMBER;
8   CURSOR c_accounts IS
9     SELECT Balance
10    FROM Account
11   WHERE BranchId = p_branch_id;
12 BEGIN
13
14   OPEN c_accounts;
15   LOOP
16     FETCH c_accounts INTO v_balance;
17     EXIT WHEN c_accounts%NOTFOUND;
18     v_total_balance := v_total_balance + v_balance;
19     v_account_count := v_account_count + 1;
20   END LOOP;
21   CLOSE c_accounts;
22
23   IF v_account_count > 0 THEN
24     v_average_balance := v_total_balance / v_account_count;
25   ELSE
26     v_average_balance := 0;
27   END IF;
28
29   RETURN v_average_balance;
30 EXCEPTION
31   WHEN NO_DATA_FOUND THEN
32     RETURN 0;
33   WHEN OTHERS THEN
34     RETURN 0;
35 END;
```

405	405	200	123456	1	AAAE5VAABAAAK+iABQ ...
179	99	756221	528163	1	AAAE5VAABAAAK+hACy ...
80	181	668519	443889	119	AAAE5VAABAAAK+hABP ...
81	1	200	123456	1	AAAE5VAABAAAK+hABQ ...
82	2	0	654321	2	AAAE5VAABAAAK+hABR ...
83	3	1234	615243	1	AAAE5VAABAAAK+hABS ...

Test script DBMS Output Statistics Profiler Trace 205

```
1 begin
2   -- Call the function
3   :result := get_average_balance_by_branch(p_branch_id => :p_branch_id);
4 end;
```

Variable	Type	Value
result	Float	189463.75
p_branch_id	Float	1

פונקציה להחזרת שמות לקוחות המחזיקים בחשבון מסוים

הסבר על הפונקציה-

הגדרת רשומה: הגדרת רשומה (client_record) המכילה את השדות client_id, client_name ו-client_last_name.

הגדרת משתנים: משתנה לרשימת הלקוחות (v_client_list), אחסון הרשומה הנוכחית (v_client) ו-cursor (v_cursor).

פתיחת cursor: הפונקציה פותחת cursor לאחזור כל הלקוחות המחזיקים בחשבון הנתון (p_account_id).

לולאת WHILE: הפונקציה משתמשת בלולאה כדי לקרוא את כל הרשומות מה-cursor ולהוסיף את שמות הלקוחות לרשימה מופרדת בפסיקים.

סגירת cursor: לאחר סיום הלולאה, הפונקציה סוגרת את ה-cursor ומחזירה את רשימת הלקוחות.

חריגות: טיפול בחריגות וסגירת cursor במקרה של חריגה.

```
get_account_clients
Exception handler
> Parameter list
> Declaration
> Code section
> Exception handler
1 CREATE OR REPLACE FUNCTION get_account_clients(p_account_id NUMERIC)
2 RETURN VARCHAR2
3 IS
4 TYPE client_record IS RECORD (
5     client_id NUMERIC(5),
6     client_name VARCHAR2(30),
7     client_last_name VARCHAR2(30)
8 );
9 v_client_list VARCHAR2(4000) := '';
10 v_client client_record;
11 v_cursor SYS_REFCURSOR;
12
13 BEGIN
14 OPEN v_cursor FOR
15     SELECT c.ClientId, c.ClientName, c.ClientLastName
16     FROM Client c
17     JOIN activity a ON c.ClientId = a.ClientId
18     WHERE a.AccountId = p_account_id;
19
20 LOOP
21     FETCH v_cursor INTO v_client;
22
23     EXIT WHEN v_cursor%NOTFOUND;
24     IF v_client_list IS NOT NULL THEN
25         v_client_list := v_client_list || ', ';
26     END IF;
27
28     v_client_list := v_client_list || v_client.client_name || ' ' || v_client.client_last_name;
29 END LOOP;
30
31 CLOSE v_cursor;
32
33 RETURN v_client_list;
34
35 EXCEPTION
36 WHEN OTHERS THEN
37     IF v_cursor%ISOPEN THEN
38         CLOSE v_cursor;
39     END IF;
40     RETURN NULL;
41 END;
```

Test script
DBMS Output
Statistics
Profiler
Trace
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```

1 begin
2   -- Call the function
3   :result := get_account_clients(p_account_id => :p_account_id);
4 end;

```

Variable	Type	Value
result	String	Patty Emmerich, Kimberly Tate
p_account_id	Float	12

	ACTIVITYID	CLIENTID	ACTIONID	ACCOUNTID	WORKERID	ROWID
1	609	235	340	12	47	AAAE5bAABAAK/aACH ...
2	745	144	319	12	199	AAAE5bAABAAK/aAEP ...

	CLIENTID	CLIENTNAME	CLIENTADDRESS	CLIENTLASTNAME	ROWID
1	144	Patty	113 Curtis-Hall	Emmerich	AAAE5ZAABAAK/BAAo ...

	CLIENTID	CLIENTNAME	CLIENTADDRESS	CLIENTLASTNAME	ROWID
1	235	Kimberly	71 Flack Road	Tate	AAAE5ZAABAAK/DAAq ...

עדכון יתרה בחשבון לאחר פעולה

הפרוצדורה תעדכן את יתרת החשבון לאחר ביצוע פעולה (הפקדה או משיכה).

```
update_account_balance
1 CREATE OR REPLACE PROCEDURE update_account_balance (
2   p_account_id NUMERIC,
3   p_action_name VARCHAR2,
4   p_action_sum INT
5 )
6 IS
7   v_balance INT;
8 BEGIN
9   -- שליפת יתרת החשבון הנוכחית
10  SELECT Balance INTO v_balance
11  FROM Account
12  WHERE AccountId = p_account_id;
13
14  -- עיבוד הפעולה ועדכון היתרה
15  IF p_action_name = 'Deposit' THEN
16    v_balance := v_balance + p_action_sum;
17  ELSIF p_action_name = 'Withdrawing Funds' THEN
18    IF v_balance >= p_action_sum THEN
19      v_balance := v_balance - p_action_sum;
20    ELSE
21      RAISE_APPLICATION_ERROR(-20001, 'Insufficient balance for withdrawal.');
```

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

	ACCOUNTID	BALANCE	ACCOUNTNUMBER	BRANCHID	ROWID
1	102	758435	927934	254	AAAE5VAABAAAK+hAAA
2	103	242779	491276	377	AAAE5VAABAAAK+hAAB
3	104	132936	973559	65	AAAE5VAABAAAK+hAAC
4	105	346754	990328	144	AAAE5VAABAAAK+hAAD
5	106	382756	844587	247	AAAE5VAABAAAK+hAAE
6	107	614219	664427	390	AAAE5VAABAAAK+hAAF
7	108	635030	139149	312	AAAE5VAABAAAK+hAAG

```
1 begin
2   -- Call the procedure
3   update_account_balance(p_account_id => :p_account_id,
4     p_action_name => :p_action_name,
5     p_action_sum => :p_action_sum);
6 end;
```

Variable	Type	Value
p_account_id	Float	103
p_action_name	String	Withdrawing Funds
p_action_sum	Float	10000

Output statistics

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

	ACCOUNTID	BALANCE	ACCOUNTNUMBER	BRANCHID	ROWID
1	102	758435	927934	254	AAAE5VAABAAAK+hAAA
2	103	232779	491276	377	AAAE5VAABAAAK+hAAB
3	104	132936	973559	65	AAAE5VAABAAAK+hAAC
4	105	346754	990328	144	AAAE5VAABAAAK+hAAD

יצירת לקוח חדש עם חשבון ראשוני

הפרוצדורה תיצור רשומת לקוח חדשה ורשומת חשבון חדשה עבורו, עם יתרה ראשונית מסוימת.

```
CREATE OR REPLACE PROCEDURE create_client_with_account (
    p_client_name VARCHAR2,
    p_client_last_name VARCHAR2,
    p_client_address VARCHAR2,
    p_initial_balance INT,
    p_branch_id NUMERIC
)
IS
    v_client_id NUMERIC;
    v_account_id NUMERIC;
BEGIN
    -- יצירת מזהה לקוח חדש
    SELECT NVL(MAX(ClientId), 0) + 1 INTO v_client_id
    FROM Client;

    -- יצירת לקוח חדש
    INSERT INTO Client (ClientId, ClientName, ClientLastName, ClientAddress)
    VALUES (v_client_id, p_client_name, p_client_last_name, p_client_address);

    -- יצירת מזהה חשבון חדש
    SELECT NVL(MAX(AccountId), 0) + 1 INTO v_account_id
    FROM Account;

    -- יצירת חשבון חדש עבור הלקוח
    INSERT INTO Account (AccountId, Balance, AccountNumber, BranchId)
    VALUES (v_account_id, p_initial_balance, v_account_id + 1000, p_branch_id);

    COMMIT;
EXCEPTION
    WHEN OTHERS THEN
        DBMS_OUTPUT.PUT_LINE('Error: ' || SQLERRM);
        ROLLBACK;
END;
```

Test Window - Script for procedure CREATE_CLIENT_WITH_ACCOUNT@XE

Test script DBMS Output Statistics Profiler Trace

```
1 begin
2 -- Call the procedure
3 create_client_with_account(p_client_name => :p_client_name,
4 p_client_last_name => :p_client_last_name,
5 p_client_address => :p_client_address,
6 p_initial_balance => :p_initial_balance,
7 p_branch_id => :p_branch_id);
8 end;
```

Variable	Type	Value
p_client_name	String	Reut
p_client_last_name	String	Agam
p_client_address	String	Noyfeld 8, Beny Brak
p_initial_balance	Float	100000
p_branch_id	Float	66

Output Statement

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

CLIENTID	CLIENTNAME	CLIENTADDRESS	CLIENTLASTNAME	ROWID
254	582 Steffane	25 Tomscot Plaza	Jeffes	AAAE5ZAABAAAK/CAA
255	472 Shara	96 Thackeray Court	Benninger	AAAE5ZAABAAAK/CABA
256	466 Myrtle	948 David Terrace	Dentith	AAAE5ZAABAAAK/CABB
257	556 Ceil	2 Shoshone Avenue	Mor	AAAE5ZAABAAAK/CABC
258	469 Skelly	556 Arrowood Center	Alben	AAAE5ZAABAAAK/CABD
259	611 Kelcey	59358 Shasta Street	Abraham	AAAE5ZAABAAAK/CABE
260	679 Gnny	7 Lindbergh Terrace	Smidmore	AAAE5ZAABAAAK/CABF
261	646 Pascal	33166 Golf Course Circle	Rawlings	AAAE5ZAABAAAK/CABG
262	607 Chucho	4608 Farwell Park	Gheerhaert	AAAE5ZAABAAAK/CABH
263	579 Phedra	99 Dapin Avenue	Ausher	AAAE5ZAABAAAK/CABI
264	680 Reut	Noyfeld 8, Beny Brak	Agam	AAAE5ZAABAAAK/CABJ
265	193 Maceo	41 Chemnitz Street	Mueller-Stahl	AAAE5ZAABAAAK/DAAA

402	402	50748	530794	239	AAAE5VAABAAAK+iABN
403	403	957002	743297	11	AAAE5VAABAAAK+iABO
404	404	791167	942120	317	AAAE5VAABAAAK+iABP
405	405	200	123456	1	AAAE5VAABAAAK+iABQ
406	406	0	654321	2	AAAE5VAABAAAK+iABR
407	407	0	777771	2	AAAE5VAABAAAK+iABS
408	408	100000	1408	66	AAAE5VAABAAAK+iABT

תוכנית ראשית 1:

מזמנת את הפונקציה - get_average_balance_by_branch

ואת הפרוצדורה - create_client_with_account

```
DECLARE
v_branch_id NUMERIC := 65; -- Example branch ID
v_average_balance NUMBER;
v_client_name VARCHAR2(30) := 'Reut'; -- Example client name
v_client_last_name VARCHAR2(30) := 'Agam'; -- Example client last name
v_client_address VARCHAR2(100) := 'simchoni 1, Bney Brak'; -- Example client address
v_initial_balance INT := 20000; -- Example initial balance
v_branch_id_create NUMERIC := 2; -- Branch ID for account creation

BEGIN
-- Calling the function to get the average balance by branch
v_average_balance := get_average_balance_by_branch(v_branch_id);
DBMS_OUTPUT.PUT_LINE('Average balance for branch ' || v_branch_id || ' is: ' || v_average_balance);

-- Calling the procedure to create a new client with an account
create_client_with_account(
p_client_name => v_client_name,
p_client_last_name => v_client_last_name,
p_client_address => v_client_address,
p_initial_balance => v_initial_balance,
p_branch_id => v_branch_id_create
);
DBMS_OUTPUT.PUT_LINE('Client ' || v_client_name || ' ' || v_client_last_name || ' has been created with a new account.');
```

```
EXCEPTION
WHEN OTHERS THEN
DBMS_OUTPUT.PUT_LINE('Error: ' || SQLERRM);
END;
```

Average balance for branch 65 is: 132936
Client Reut Agam has been created with a new account.

	CLIENTID	CLIENTNAME	CLIENTADDRESS	CLIENTLASTNAME	ROWID
1	2	Reut	RabiAkiva 11,Bnei Brak	Agam	AAAE5ZAABAAAK/BABB
2	680	Reut	Noyfeld 8, Beny Brak	Agam	AAAE5ZAABAAAK/CABJ
3	687	Reut	simchoni 1, Bney Brak	Agam	AAAE5ZAABAAAK/CABQ

	ACCOUNTID	BALANCE	ACCOUNTNUMBER	BRANCHID	ROWID
1	104	132936	973559	65	AAAE5VAABAAAK+hAAC

תוכנית ראשית 2:

מזמנת את הפונקציה - get_account_clients

ואת הפרוצדורה - update_account_balance

```
TEST WINDOW - New
Test script DBMS Output Statistics Profiler Trace

1 DECLARE
2   v_account_id NUMERIC := 15; -- Example account ID
3   v_client_list VARCHAR2(4000);
4   v_action_name VARCHAR2(15) := 'Withdrawing'; -- Example action
5   v_action_sum INT := 1500; -- Example action sum
6   v_update_account_id NUMERIC := 105; -- Example account ID for update
7
8 BEGIN
9   -- Calling the function to get account clients
10  v_client_list := get_account_clients(v_account_id);
11  DBMS_OUTPUT.PUT_LINE('Clients for account ' || v_account_id || ': ' || v_client_list);
12
13  -- Calling the procedure to update account balance
14  update_account_balance(p_account_id => v_update_account_id, p_action_name => v_action_name, p_action_sum => v_action_sum);
15  DBMS_OUTPUT.PUT_LINE('Account ' || v_update_account_id || ' has been updated successfully.');
```

Clients for account 15: Giovanni Cruz, Phil Rucker
Account 105 has been updated successfully.

	ACTIVITYID	CLIENTID	ACTIONID	ACCOUNTID	WORKERID	ROWID
▶ 1	538	179	27	15	352	AAAE5bAABAAAK/aABA ...
2	758	225	186	15	391	AAAE5bAABAAAK/aAEc ...

	CLIENTID	CLIENTNAME	CLIENTADDRESS	CLIENTLASTNAME	ROWID
▶ 1	225	Phil	40 Kingsley Street	Rucker	AAAE5ZAABAAAK/DAAg ...

	CLIENTID	CLIENTNAME	CLIENTADDRESS	CLIENTLASTNAME	ROWID
▶ 1	179	Giovanni	487 Tinsley Drive	Cruz	AAAE5ZAABAAAK/BACw ...

	ACCOUNTID	BALANCE	ACCOUNTNUMBER	BRANCHID	ROWID
1	102	4418435	927934	254	AAAE5VAABAAAK+hAAA ...
2	103	232779	491276	377	AAAE5VAABAAAK+hAAB ...
3	104	132936	973559	65	AAAE5VAABAAAK+hAAC ...
4	105	346754	990328	144	AAAE5VAABAAAK+hAAD ...
5	106	382756	844587	247	AAAE5VAABAAAK+hAAE ...
6	107	614219	664427	390	AAAE5VAABAAAK+hAAF ...

SQL Output Statistics

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



	ACCOUNTID	BALANCE	ACCOUNTNUMBER	BRANCHID	ROWID
1	102	4418435	927934	254	AAAE5VAABAAAK+hAAA ...
2	103	232779	491276	377	AAAE5VAABAAAK+hAAB ...
3	104	132936	973559	65	AAAE5VAABAAAK+hAAC ...
4	105	345254	990328	144	AAAE5VAABAAAK+hAAD ...
5	106	382756	844587	247	AAAE5VAABAAAK+hAAE ...
6	107	614219	664427	390	AAAE5VAABAAAK+hAAF ...
7	108	635030	139149	312	AAAE5VAABAAAK+hAAG ...