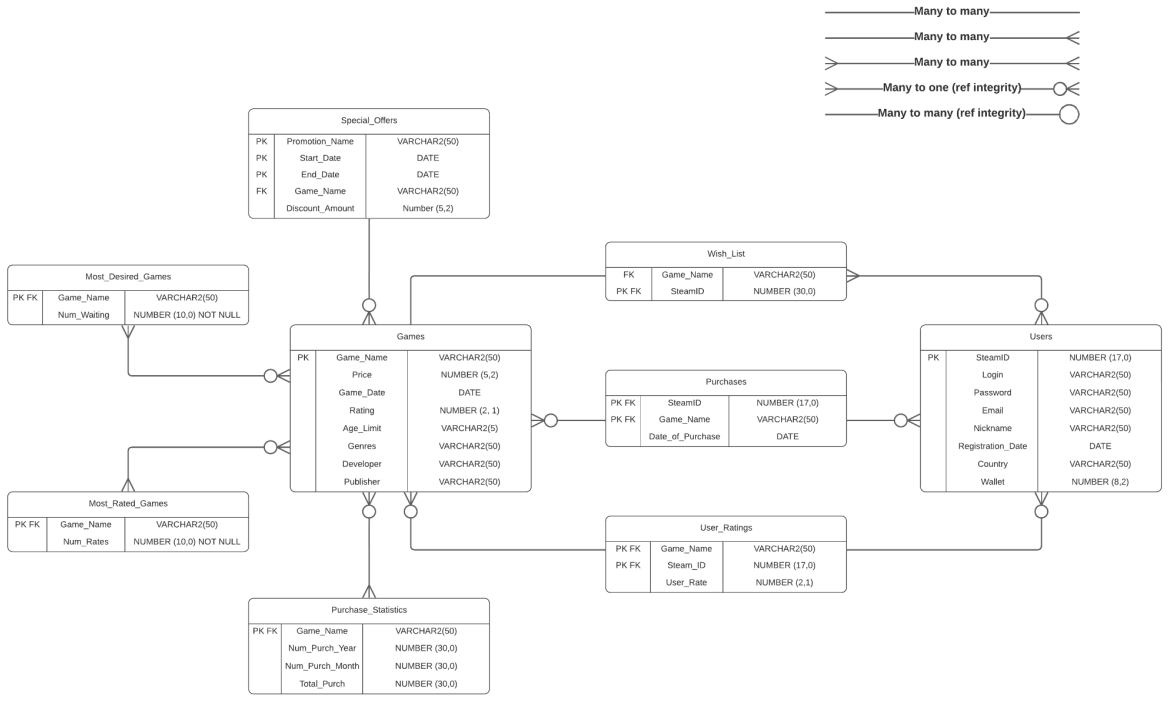
DBMS 2 Midterm project

Introduction:

Steam is an electronic online store for purchasing various games since 1990 up to nowadays, the Steam system includes product categorization, search functions, purchase management client and different types of information organization, database management for storing and organizing information about products, customers and opinions.

Link to Github https://github.com/Aidos-Karakulov/DBMS_2.git

1) ER Diagram and relations



In our main table Games we have one PK (Game_Name) and all of the attributes that describe information about the game and are dependent on it. This satisfies 3NF.

Why is the name of the game is key, after all the name is not always unique?

Game names are unique - after all, the repetition of the name entails copyright infringement. Because the games do not repeat the names of each other.

The little tables Most_Rated/Desired_Games are very simple, and as their names indicate, they determine the most desired and rated games.

They have only one attribute dependent on Game_Name – 3NF satisfied, each game may have only one number of rates and waiting people – atomicity also satisfied.

With Purchase_Statistics same situation – but with two extra attributes.

This table shows the number of purchases in the last month/year/all time.

Special_Offers have differences: we have huge PK, because the name is not guaranteed unique, and other offers may start or end in one time, but no offers can be at the same start-end time with the same name.

About attribute Discount_Amount – this is the percent of discount to the game.

Purchases and User_Ratings are the same: two-attribute key and one dependent attribute.

Why key is such?

In purchases one user may buy several games at once.

And with only ID we can’t find a certain purchase at a certain time.

In first this table had attribute price – but it turned out to be a mistake - a independent dependency appears:

SteamID, Game_Name --> Date_of_Purchase and
Game_Name --> Price.

So we just delete the price – if it is so needed, we may make a query or view, that would include the price.

In ratings it is very simple: a certain user puts a rate on a certain game.

A certain user can rate a certain game.

Without the name of the game in the primary key, we simply will not be able to understand what rating is given to which game.

The Users table is like a games table: one PK and many attributes.

About relations: we made my own system, which stands in the corner of the diagram.

No, we didn't add anything new - we just labeled certain views that are similar to what they should look like.

This is also simple:

In tables Most_Desired_Games, Most_Rated_Games and Purchase_Statictics one game can appear only once.

In other tables connected with Games one game can appear many times: one game may be in some offers, wish lists, one game can be bought or rated by many users.

Almost all tables have a connection with referential integration to table Games.

Because if a game is present in the statistics/offer or rated, then it must be in the main table.

And this game should be represented in main table only once.

But only with Wish_List relation is “all”, because one game may appear in this table many times – one game may be in thousands of wish_lists.

Second big table – Users.

One user can buy or rate many games – but may have only one wish list.

But certain wish list/purchase/rate must belong only to one user.

2) Functional dependencies

Games:

Game_Name --> Price, Game_Date, Rating, Age_Limit, Genres, Publisher, Developer

Special_Offers:

Promotion_Name, Start_Date, End_Date --> Game_Name, Discount_Amount

Purchase_Statistics:

Game_Name --> Num_Purch_Year, Num_Purch_Month, Total_Purch

Most_Rated_Games:

Game_Name --> Num_Rates

Most_Desired_Games:

Game_Name --> Num_Waiting

Users:

SteamID --> Login, Password, Email, Nickname, Registration_Date, Country, Wallet

Wish_List:

SteamID --> Game_Name

Purchases:

SteamID, Game_Name --> Date_of_Purchase

User_Ratings:

Steam_ID, Game_Name -> User_Rate

This is a boring theme – what we may tell about this, if all information was described in part about ERD?

but O-kay, it still shows well that all tables conform to normal forms.

3)Triggers

```
create or replace TRIGGER num_of_waiting_games
BEFORE INSERT ON wish_list FOR EACH ROW
```

```
DECLARE
num_of_curr_rows NUMBER;
BEGIN
SELECT COUNT(*) INTO num_of_curr_rows FROM
wish_list where steamID = :NEW.steamID;
DBMS_OUTPUT.PUT_LINE('The number of games you wish
to play: ' || num_of_curr_rows);
END;
```

The triggers name “num_of_rows” and use syntax “CREATE OR REPLACE TRIGGER”
“Before INSERT ON special_offers” Trigger mean should be work executed before a new row is inserted into table “special_offers”
“Declare ” keyword is used to declare a variable “num_of_rows ” type of “Number”.
“Begin” the start Trigger
“Select Count(*) INTO num_of_rows From special_offers” statement queries the table “special_offers” count the number of rows in the table .Result is stored in the “num_of_rows” variable.
“DBMS_OUTPUT.PUT_LINE” statement prints a message to the console and shows the number of rows in the “special_offers” table before the insert operations.
"END" is already the end point of the trigger and this is the very creation or replacion

4)Procedure

```
create or replace PROCEDURE raise_price(
publisher_name IN games.publisher%TYPE,
raise_procent IN NUMBER
) AS
upd_affected NUMBER;
BEGIN
UPDATE Games
SET price = price + price * (raise_procent / 100)
WHERE publisher = publisher_name;
IF sql%notfound THEN
dbms_output.put_line('There is no such
publisher!');
ELSEIF sql%found THEN
upd_affected := SQL%ROWCOUNT;
dbms_output.put_line('The prices of ' ||
upd_affected || ' games have been updated.');
END IF;
END;
```

1.
Update Games Set price = price +price*(raise_procent/100)
Where publisher = publisher_name;
The Update operator is needed to increase the price of all games from a given publisher, i.e. from "Publisher_name"

IF sql%notfound THEN dbms_output.put_line(‘There is no such publisher!’); Use the conditional IF statement in this row to check if there are any entries in the Games table If there is no error message is displayed.

ElseIF sql%found THEN upd_affected := SQLROWCOUNT; dbms_output.put_line(‘The prices of ‘ || upd_affected || ‘ games have been updated ‘); END IF;
If the UPDATE statement updated any data in the table, we store the number of updated records in a variable called "upd_affected".After that we show on the screen indicating that the prices for the specified number of games have been updated successfully

```
create or replace PROCEDURE game_statistics(game_name_stat IN
games.game_name%TYPE) AS
num_of_pur NUMBER;
price games.price%TYPE;
total_money NUMBER;
BEGIN
    SELECT g.price, count(p.steamID) INTO price, num_of_pur FROM Games g
    JOIN Purchases p ON g.Game_Name = p.Game_Name
    WHERE g.Game_Name = game_name_stat
    GROUP BY g.price, g.Game_Name;

    total_money := num_of_pur * price;
    DBMS_OUTPUT.PUT_LINE('Statistics for "' || game_name_stat || '" game');
    DBMS_OUTPUT.PUT_LINE('Number of Purchases: ' || num_of_pur);
    DBMS_OUTPUT.PUT_LINE('Total money earned: $' || total_money);
END;
```

2.
The procedure shows how much the game has earned.
The name of the procedure is game_name_stat which is an attribute of the column called game_name of the table Games. Inside the procedure Select is used to combine the tables Games and Purchases with the condition Where it selects the

information of a certain game that you named passed as a parameter.
The SELECT result contains the price of the game and the number of purchases for that game, which is stored in a variable named price and num_of_pur
Before the end, the procedure calculates the total amount of money earned from selling the game by multiplying the number of games and stores it in a variable called total_money.
At the end the procedure outputs the result to the console via DBMS_OUTPUT.PUT_LINE

```
create or replace procedure add_special_offer(
prom_name IN special_offers.Promotion_name%TYPE,
s_date IN special_offers.START_DATE%TYPE,
e_date IN special_offers.END_DATE%TYPE,
game_name IN special_offers.GAME_NAME%TYPE,
disc_amount IN
special_offers.DISCOUNT_AMOUNT%TYPE) AS
prom_name_exc EXCEPTION;
begin
IF length(prom_name) < 5 THEN
RAISE prom_name_exc;
ELSE
INSERT INTO Special_offers VALUES(prom_name,
s_date, e_date, game_name, disc_amount);
dbms_output.put_line('NEW Special Offer "' ||
prom_name || '" added! ');
dbms_output.put_line('The ' || disc_amount || '%
discount is valid for the "' || game_name || '"
game between ' || s_date || ' and ' || e_date);
END IF;
```

```
EXCEPTION
WHEN prom_name_exc THEN
dbms_output.put_line('The Promotion Name is too
short! It must be greater than 5. ');
WHEN others THEN
dbms_output.put_line('Error!');
end;
```

5) Exception
This exception describes how to add a new special offer to the Special_offers table.

"add_special_offer(prom_name IN special_offers.Promotion_name%TYPE, s_date IN special_offers.START_DATE%TYPE, e_date IN special_offers.END_DATE%TYPE, game_name IN special_offers.GAME_NAME%TYPE, disc_amount IN special_offers.DISCOUNT_AMOUNT%TYPE) AS prom_name_exc EXCEPTION;
"

The procedure takes input parameters: promotion name (prom_name), start and end dates (s_date and e_date), game name (game_name), and discount amount (disc_amount).

"begin
IF length(prom_name) < 5
THEN
RAISE prom_name_exc;
"

If the offer name is shorter than 5 characters, then a prom_name_exc exception is generated.

"ELSE
INSERT INTO Special_offers
VALUES(prom_name, s_date, e_date, game_name, disc_amount); dbms_output.put_line('NEW Special Offer ''' prom_name ''' added! '); dbms_output.put_line('The ' disc_amount '% discount is valid for the ''' game_name ''' game between ' s_date ' and ' || e_date);
END IF;
"

Otherwise, an entry is added to the table and a message is displayed about adding a new special offer.

"EXCEPTION
WHEN prom_name_exc
THEN dbms_output.put_line('The Promotion Name is too short! It must be greater than 5. ');
WHEN others
THEN dbms_output.put_line('Error!'); end;
"

If any other error occurs, an error message is displayed.

```
CREATE OR REPLACE FUNCTION
num_of_records(table_name IN VARCHAR2)
RETURN NUMBER IS
   total_records NUMBER := 0;
BEGIN
   EXECUTE IMMEDIATE 'SELECT COUNT(*) FROM ' ||
table_name INTO total_records;
   RETURN total_records;
END;
```

6) Function

This function named num_of_records that takes a single input parameter, Games, which is a Varchar(2) data type. The purpose of this function is to return the total number of records present in a specified database table. The function uses dynamic SQL to execute a Select count(*) statement on the specified table. The Execute immediate statement allows the function to dynamically generate and execute SQL code at runtime. The result of the Select statement is then assigned to the total_records variable using the Into clause.

```
  Create Or Replace Function num_of_records(Games IN
VARCHAR2)
RETURN NUMBER IS
  total_records NUMBER := 0;
BEGIN
```

```
   EXECUTE IMMEDIATE 'Select COUNT(*) From ' || Games INTO
total_records;
   RETURN total_records;
END;
```

Finally, the function returns the value of the total_records variable, which represents the total number of records in the specified table. If the table name provided is not valid, or the user executing the function does not have appropriate

privileges to query the table, the function will raise an exception.

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