Projekt bazy danych dla aplikacji do zarządzania budżetem domowym

Narzędzia użyte do wykonania projektu

- PostgreSQL - jako silnik bazy danych
- Docker - narzędzie do konteneryzacji użyte do uruchomienia bazy danych PostgreSQL bez potrzeby pobierania oraz instalowania
- DBSchema - narzędzie do stworzenia diagramu ERD

Analiza wstępna wymagań

Cel

Aplikacja ma na celu zarządzanie budżetem domowym użytkowników poprzez rejestrowanie przychodów oraz wydatków, analizy przepływów majątku oraz sporządzaniem podsumowań oraz raportów

Zakres

Baza danych będzie obsługiwać użytkowników, ich portfele, grupy, kategorie wydatków oraz raporty finansowe

Wymagania funkcjonalne

Funkcjonalność aplikacji została podzielona na poniższe moduły:

Użytkownicy

- Rejestrowania użytkownika
- Logowanie użytkownika oraz przechowywanie aktywnych sesji
- Przechowywanie danych użytkownika, takich jak:
  - email;
  - imię i nazwisko;
  - unikalny nick;
  - zaszyfrowane hasło
  - obywatelstwo;
- Obsługa wielu użytkowników z separacją ich danych

Portfele

- Możliwość tworzenia wielu portfeli przez użytkowników
- Portfele mogą być tworzone w różnych walutach
- Do portfeli możemy wpłacać oraz z nich wypłacać pieniądze

Grupy

- Grupa może zawierać wielu użytkowników
- Każda grupa posiada:
  - nazwę;
  - opis (opcjonalne);
  - zdjęcie (opcjonalne);
- Użytkownicy mogą tworzyć oraz dołączać do grup
- Użytkownicy w grupach podzieleni są na role:
  - administator;
  - guest;

Tranzakcje

- Rejestrowanie przychodów i wydatków
- Uwzględnienie użytkownika, grupy oraz portfela
- Kwalifikowanie tranzakcji względem kategorii oraz podkategorii (opcjonalne)
- Tylko portfele z wystarczającymi środkami mogą wykonać określoną transakcje

Kategorie

- Tworzenie własnych kategorii i podkategorii
- Podsumowania tworzone uwzględniając kategorie
- Użycie kategorii w transakcjach

Raporty

- Korzystanie z tej bazy danych ułatwi analizę danych oraz uprości pracę programistą w celu przygotowania raportów dla użytkowników lub grup

Wymagania niefunkcjonalne

Bezpieczeństwo

- Zapis *Posolonych* haseł
- Ograniczony dostęp do danych użytkownika - każdy użytkownik widzi tylko swoje dane
- Tylko administratorzy mają możliwość dodawania, zmiany uprawnień oraz usuwania użytkowników z grupy

Zgodność

- Zgodność z systemem `PostreSQL`

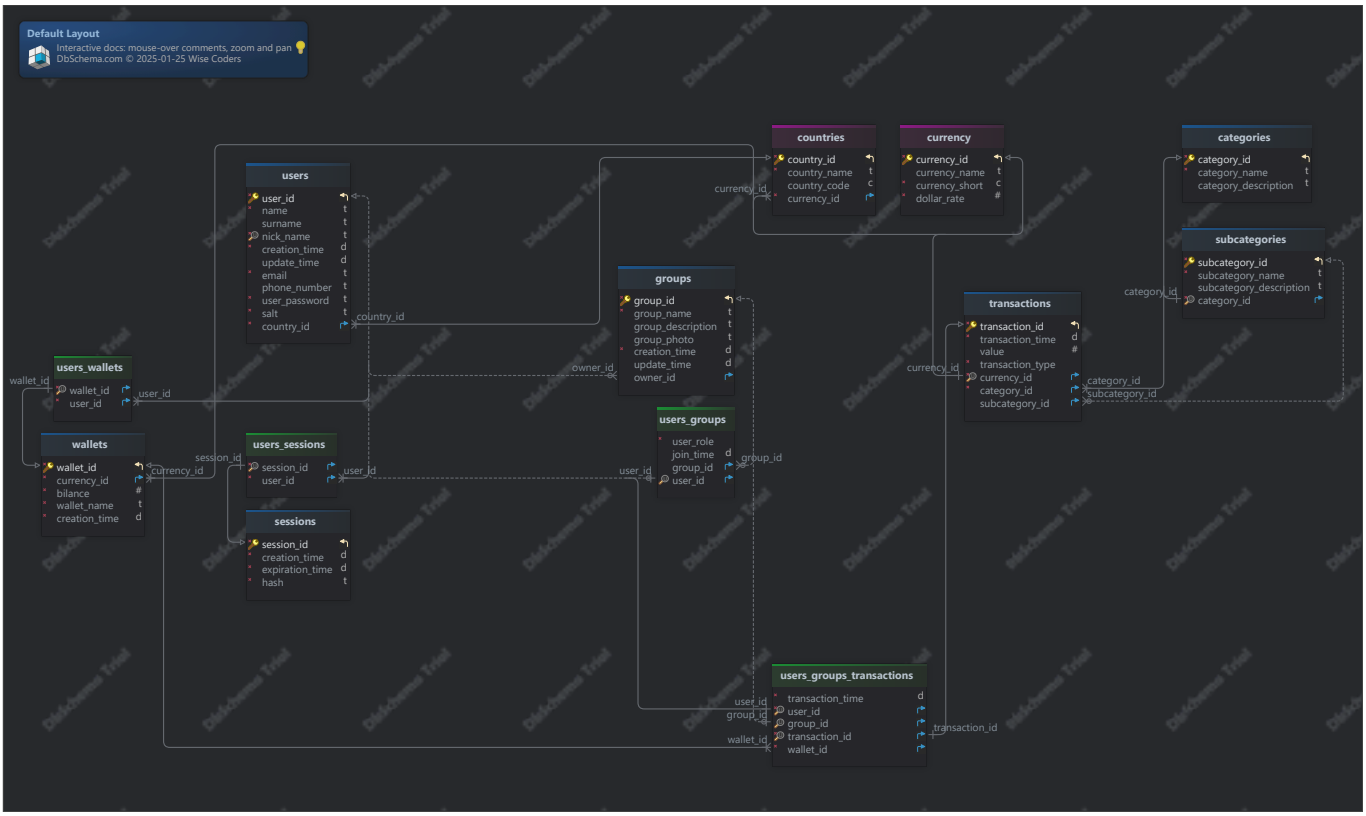
Wydajność

- Czas odpowiedzi na zapytania nie powinien przekraczać 1 sekundy dla typowych operacji

Implementacja

- Implementacja z bazą za pomocą utworzonych gotowych funkcji

Model ERD



Tabele

Tabela categories

Idx	Name	Data Type
* 🔑 ✎	category_id	integer GENERATED BY DEFAULT AS IDENTITY
*	category_name	varchar(100)
	category_description	varchar(1000)

Indexes

Type	Name	On
🔑	pk_categories	ON category_id

Tabela countries

Idx	Name	Data Type	Description
* 🔑 ↙	country_id	integer GENERATED BY DEFAULT AS IDENTITY	
	country_name	varchar(200)	
* 🔍	country_code	char(5) UNIQUE	Short name of country
* ↗	currency_id	integer	

Indexes

Type	Name	On
🔑	pk_countries	ON country_id
🔍	countries_country_code_key	ON country_code

Foreign Keys

Type	Name	On
	fk_countries_currency	(currency_id) ref currency (currency_id)

Tabela currency

Idx	Name	Data Type	Description
* 🔑 ↙	currency_id	integer GENERATED BY DEFAULT AS IDENTITY	
	currency_name	varchar(100)	
* 🔍	currency_short	char(3) UNIQUE	Short name of currenty, for example USD for Dollar
*	dollar_rate	numeric(100,4)	Used for currency calculation.

Indexes

Type	Name	On
🔑	pk_currency	ON currency_id
🔍	currency_currency_short_key	ON currency_short

Tabela groups

Idx	Name	Data Type	Description
* 🔑 ↙	group_id	integer GENERATED BY DEFAULT AS IDENTITY	

Idx	Name	Data Type	Description
*	group_name	varchar DEFAULT 'New Group'::character varying	
	group_description	varchar(1000)	
	group_photo	varchar(1000)	Url to photo of group
*	creation_time	timestamp DEFAULT CURRENT_TIMESTAMP	
	update_time	timestamp	
➚	owner_id	integer	Id of user who created group

Indexes

Type	Name	On
🔑	pk_groups	ON group_id

Foreign Keys

Type	Name	On
	fk_groups_users	(owner_id) ref users (user_id)

Triggers

Name	Definition

Trigger group_update_time_trigger

```
CREATE TRIGGER group\_update\_time\_trigger BEFORE UPDATE ON "home budget
application".groups FOR EACH ROW EXECUTE FUNCTION "home budget
application".update\_group\_update\_time()
```

Tabela sessions

Idx	Name	Data Type	Description
* 🔑 ➘	session_id	integer GENERATED BY DEFAULT AS IDENTITY	
*	creation_time	timestamp DEFAULT CURRENT_TIMESTAMP	
*	expiration_time	timestamp DEFAULT (CURRENT_TIMESTAMP + '24:00:00'::interval)	

Idx	Name	Data Type	Description
*	hash	text DEFAULT md5(((random())::text	

Indexes

Type	Name	On
🔑	pk_sessions	ON session_id

Tabela subcategories

Idx	Name	Data Type
* 🔑 ↙	subcategory_id	integer GENERATED BY DEFAULT AS IDENTITY
*	subcategory_name	varchar(100)
	subcategory_description	varchar(1000)
* 🔍 ↗	category_id	integer

Indexes

Type	Name	On
🔑	pk_subcategories	ON subcategory_id
🔍	unq_subcategories_category_id	ON category_id

Foreign Keys

Type	Name	On
	fk_subcategories_categories	(category_id) ref categories (category_id)

Tabela transactions

Idx	Name	Data Type	Description
* 🔑 ↙	transaction_id	integer GENERATED BY DEFAULT AS IDENTITY	
*	transaction_time	timestamp DEFAULT CURRENT_TIMESTAMP	
	value	numeric(10,2)	
*	transaction_type	"home budget application".home	Enum type with two options: 'deposit' and 'withdraw'

Idx	Name	Data Type	Description
* 🔍 ↗	currency_id	integer	
* ↗	category_id	integer	
↗	subcategory_id	integer	

Indexes

Type	Name	On
🔑	pk_transactions	ON transaction_id
🔍	unq_transactions_currency_id	ON currency_id

Foreign Keys

Type	Name	On
	fk_transactions_currency	(currency_id) ref currency (currency_id)
	fk_transactions_subcategories	(subcategory_id) ref subcategories (subcategory_id)
	fk_transactions_categories	(category_id) ref categories (category_id)

Tabela users

Users of the application

Idx	Name	Data Type	Description
* 🔑 ↙	user_id	integer GENERATED BY DEFAULT AS IDENTITY	
*	name	varchar(100)	
	surname	varchar(100)	
* 🔍	nick_name	varchar(100)	
*	creation_time	timestamp DEFAULT CURRENT_TIMESTAMP	Timestamp of user creation
	update_time	timestamp	Timestamp of user data update
*	email	varchar(100) unique	
	phone_number	varchar(15)	
*	user_password	varchar(100)	
*	salt	varchar(100)	

Idx	Name	Data Type	Description
* ↗	country_id	integer	

Indexes

Type	Name	On
🔑	pk_users	ON user_id
🔍	unq_users_nick_name	ON nick_name

Foreign Keys

Type	Name	On
	fk_users_countries	(country_id) ref countries (country_id)

Triggers

Name	Definition

Trigger user_update_time_trigger

```
CREATE TRIGGER user\_update\_time\_trigger BEFORE UPDATE ON "home budget
application".users FOR EACH ROW EXECUTE FUNCTION "home budget
application".update\_user\_update\_time()
```

Tabela users_groups

Idx	Name	Data Type	Description
*	user_role	"home budget application".home DEFAULT 'guest'::"home budget application".user_role_in_group	Enum type with values:- 'admin'- 'guest' (default)
	join_time	timestamp DEFAULT CURRENT_TIMESTAMP	
↗	group_id	integer	
🔍 ↗	user_id	integer	

Indexes

Type	Name	On
🔍	unq_users_groups_user_id	ON user_id

Foreign Keys

Type	Name	On
	fk_users_groups_users	(group_id) ref groups (group_id)
	fk_users_groups_users_0	(user_id) ref users (user_id)

Tabela users_groups_transactions

Idx	Name	Data Type
*	transaction_time	timestamp DEFAULT CURRENT_TIMESTAMP
* 🔍 ↗	user_id	integer
🔍 ↗	group_id	integer
* 🔍 ↗	transaction_id	integer
* ↗	wallet_id	integer

Indexes

Type	Name	On
🔍	unq_users_groups_transactions_user_id	ON user_id
🔍	unq_users_groups_transactions_group_id	ON group_id
🔍	unq_users_groups_transactions_transaction_id	ON transaction_id

Foreign Keys

Type	Name	On
	fk_users_groups_transactions_transactions	(transaction_id) ref transactions (transaction_id)
	fk_users_groups_transactions_groups	(group_id) ref groups (group_id)
	fk_users_groups_transactions_users	(user_id) ref users (user_id)
	fk_users_groups_transactions_wallets	(wallet_id) ref wallets (wallet_id)

Triggers

Name	Definition

Trigger update_wallet_balance_trigger

```
CREATE TRIGGER update\_wallet\_balance\_trigger AFTER INSERT ON "home budget
application".users\_groups\_transactions FOR EACH ROW EXECUTE FUNCTION "home
```

```
budget application".update\_wallet\_balance()
```

Tabela users_sessions

Idx	Name	Data Type
* 🔍 ↗	session_id	integer
* ↗	user_id	integer

Indexes

Type	Name	On
🔍	unq_users_sessions_session_id	ON session_id

Foreign Keys

Type	Name	On
	fk_users_sessions_users	(user_id) ref users (user_id)
	fk_users_sessions_sessions	(session_id) ref sessions (session_id)

Tabela users_wallets

Idx	Name	Data Type
* 🔍 ↗	wallet_id	integer
* ↗	user_id	integer

Indexes

Type	Name	On
🔍	unq_users_walets_wallet_id	ON wallet_id

Foreign Keys

Type	Name	On
	fk_users_walets_users	(user_id) ref users (user_id)
	fk_users_wallets_wallets	(wallet_id) ref wallets (wallet_id)

Tabela wallets

Idx	Name	Data Type	Description

Idx	Name	Data Type	Description
* 🔑 ↙	wallet_id	integer GENERATED BY DEFAULT AS IDENTITY	
* ↗	currency_id	integer	Currency used for this wallet
*	bilance	money DEFAULT 0	
*	wallet_name	varchar(100)	
*	creation_time	timestamp DEFAULT CURRENT_TIMESTAMP	

Indexes

Type	Name	On
🔑	pk_wallets	ON wallet_id

Foreign Keys

Type	Name	On
	fk_wallets_currency	(currency_id) ref currency (currency_id)

Implementacja

Schemat

```
-- Create Schema
CREATE SCHEMA IF NOT EXISTS "home budget application"
```

Typy danych

User_role_in_group

```
CREATE TYPE "home budget application".user_role_in_group AS
enum ( 'admin', 'guest' )
```

Transaction_type

```
CREATE TYPE "home budget application".transaction_type AS
enum ( 'deposit', 'withdraw' )
```

Tabele

Categories

```
CREATE  TABLE "home budget application".categories (
    category_id          integer  NOT NULL GENERATED BY DEFAULT AS IDENTITY  ,
    category_name        varchar(100)  NOT NULL  ,
    category_description varchar(1000)    ,
    CONSTRAINT pk_categories PRIMARY KEY ( category_id )
 )
```

Subcategories

```
CREATE  TABLE "home budget application".subcategories (
    subcategory_id       integer  NOT NULL GENERATED BY DEFAULT AS IDENTITY   ,
    subcategory_name     varchar(100)  NOT NULL  ,
    subcategory_description varchar(1000)    ,
    category_id          integer  NOT NULL  ,
    CONSTRAINT pk_subcategories PRIMARY KEY ( subcategory_id ),
    CONSTRAINT unq_subcategories_category_id UNIQUE ( category_id )
 )
```

Currency

```
CREATE  TABLE "home budget application".currency (
    currency_id          integer  NOT NULL GENERATED BY DEFAULT AS IDENTITY   ,
    currency_name        varchar(100)    ,
    currency_short       char(3)  NOT NULL  ,
    dollar_rate          numeric(100,4)  NOT NULL  ,
    CONSTRAINT pk_currency PRIMARY KEY ( currency_id )
 )
```

Countries

```
 CREATE  TABLE "home budget application".countries (
    country_id           integer  NOT NULL GENERATED BY DEFAULT AS IDENTITY   ,
    country_name         varchar(200)  NOT NULL  ,
    country_code         char(5)    ,
    currency_id          integer  NOT NULL  ,
    CONSTRAINT pk_countries PRIMARY KEY ( country_id )
 )
```

Users

```
CREATE  TABLE "home budget application".users (
    user_id             integer  NOT NULL GENERATED BY DEFAULT AS IDENTITY   ,
    name                varchar(100)  NOT NULL  ,
    surname             varchar(100)    ,
    nick_name           varchar(100)  NOT NULL  ,
    creation_time       timestamp DEFAULT CURRENT_TIMESTAMP NOT NULL  ,
    update_time         timestamp    ,
    email               varchar(100)  NOT NULL  ,
    phone_number        varchar(15)    ,
    user_password       varchar(100)  NOT NULL  ,
    salt                varchar(100)  NOT NULL  ,
    country_id          integer  NOT NULL  ,
    CONSTRAINT pk_users PRIMARY KEY ( user_id )
)

CREATE UNIQUE INDEX unq_users_nick_name ON "home budget application".users (
nick_name )
```

Wallets

```
CREATE  TABLE "home budget application".wallets (
    wallet_id           integer  NOT NULL GENERATED BY DEFAULT AS IDENTITY   ,
    currency_id         integer  NOT NULL  ,
    bilance             money DEFAULT 0 NOT NULL  ,
    wallet_name         varchar(100)  NOT NULL  ,
    creation_time       timestamp DEFAULT CURRENT_TIMESTAMP NOT NULL  ,
    CONSTRAINT pk_wallets PRIMARY KEY ( wallet_id )
)
```

Users Wallets

```
CREATE  TABLE "home budget application".users_wallets (
    wallet_id           integer  NOT NULL  ,
    user_id             integer  NOT NULL  ,
    CONSTRAINT unq_users_walets_wallet_id UNIQUE ( wallet_id )
)
```

Sessions

```
CREATE  TABLE "home budget application".sessions (
    session_id          integer  NOT NULL GENERATED BY DEFAULT AS IDENTITY   ,
    creation_time       timestamp DEFAULT CURRENT_TIMESTAMP NOT NULL  ,
    expiration_time     timestamp DEFAULT CURRENT_TIMESTAMP + INTERVAL '86400
seconds' NOT NULL  ,
```

```
    hash                text DEFAULT md5(random()::text ||
clock_timestamp()::text) NOT NULL  ,
    CONSTRAINT pk_sessions PRIMARY KEY ( session_id )
 )
```

Users sessions

```
CREATE  TABLE "home budget application".users_sessions (
    session_id          integer  NOT NULL  ,
    user_id             integer  NOT NULL  ,
    CONSTRAINT unq_users_sessions_session_id UNIQUE ( session_id )
 )
```

Groups

```
CREATE  TABLE "home budget application".groups (
    group_id            integer  NOT NULL GENERATED BY DEFAULT AS IDENTITY   ,
    group_name          varchar(100) DEFAULT 'New Group' NOT NULL  ,
    group_description   varchar(1000)    ,
    group_photo         varchar(1000)    ,
    creation_time       timestamp DEFAULT CURRENT_TIMESTAMP NOT NULL  ,
    update_time         timestamp    ,
    owner_id            integer    ,
    CONSTRAINT pk_groups PRIMARY KEY ( group_id )
 )
```

Users groups

```
 CREATE  TABLE "home budget application".users_groups (
    user_role           "home budget application".user_role_in_group  NOT NULL
DEFAULT 'guest'  ,
    join_time           timestamp DEFAULT CURRENT_TIMESTAMP   ,
    group_id            integer    ,
    user_id             integer    ,
    CONSTRAINT unq_users_groups_user_id UNIQUE ( user_id )
 )
```

Transactions

```
 CREATE  TABLE "home budget application".transactions (
    transaction_id      integer  NOT NULL GENERATED BY DEFAULT AS IDENTITY  ,
    transaction_time    timestamp DEFAULT CURRENT_TIMESTAMP NOT NULL  ,
    "value"             numeric(10,2)    ,
```

```
    transaction_type     "home budget application".transaction_type  NOT NULL  ,
    currency_id          integer  NOT NULL  ,
    category_id          integer  NOT NULL  ,
    subcategory_id       integer    ,
    CONSTRAINT pk_transactions PRIMARY KEY ( transaction_id ),
    CONSTRAINT unq_transactions_currency_id UNIQUE ( currency_id )
 )
```

Users groups transactions

```
 CREATE  TABLE "home budget application".users_groups_transactions (
    transaction_time     timestamp DEFAULT CURRENT_TIMESTAMP NOT NULL  ,
    user_id              integer  NOT NULL  ,
    group_id             integer    ,
    transaction_id       integer  NOT NULL  ,
    wallet_id            integer  NOT NULL  ,
    CONSTRAINT unq_users_groups_transactions_user_id UNIQUE ( user_id ) ,
    CONSTRAINT unq_users_groups_transactions_group_id UNIQUE ( group_id ) ,
    CONSTRAINT unq_users_groups_transactions_transaction_id UNIQUE (
transaction_id )
 )
```

Funkcje

Użytkowe

Calc currency

```
CREATE OR REPLACE FUNCTION "home budget application".calc_currency(
    input_dollar_rate numeric,
    output_dollar_rate numeric,
    input_value numeric
)
RETURNS INTEGER
LANGUAGE plpgsql
AS $function$
BEGIN
    RETURN input_value * input_dollar_rate / output_dollar_rate;
END;
$function$
;
```

Cel: Ta funkcja przelicza wartość waluty na podstawie kursu dolara.

Parametry:

- `input_dollar_rate`: Kurs wymiany waluty wejściowej w dolarach.

- `output_dollar_rate`: Kurs wymiany waluty wyjściowej w dolarach.
- `input_value`: Wartość w walucie wejściowej do przeliczenia.

Zwraca: Równowartość w walucie wyjściowej.

Triggery

update group update time

```
CREATE OR REPLACE FUNCTION "home budget application".update_group_update_time()
 RETURNS trigger
 LANGUAGE plpgsql
AS $function$
BEGIN
    NEW.update_time = CURRENT_TIMESTAMP;
    RETURN NEW;
END;
$function$
;
```

Cel: Ta funkcja triggera automatycznie aktualizuje pole update_time na bieżący znacznik czasu, gdy rząd w tabeli groups jest aktualizowany.

Parametry: Brak.

Zwraca: Zaktualizowany rząd z bieżącym znacznikiem czasu.

update user update time

```
CREATE OR REPLACE FUNCTION "home budget application".update_user_update_time()
 RETURNS trigger
 LANGUAGE plpgsql
AS $function$
BEGIN
    NEW.update_time = CURRENT_TIMESTAMP;
    RETURN NEW;
END;
$function$
;
```

Cel: Ta funkcja triggera automatycznie aktualizuje pole update_time na bieżący znacznik czasu, gdy rząd w tabeli users jest aktualizowany.

Parametry: Brak.

Zwraca: Zaktualizowany rząd z bieżącym znacznikiem czasu.

Update wallet balance

```
CREATE OR REPLACE FUNCTION "home budget application".update_wallet_balance()
RETURNS TRIGGER AS $$
DECLARE
    v_transaction "home budget application".transactions%ROWTYPE;
    v_wallet "home budget application".wallets%ROWTYPE;

    v_in_dollar_rate numeric;
    v_out_dollar_rate numeric;
    v_calc_value numeric;
BEGIN
    SELECT * INTO v_transaction
    FROM "home budget application".transactions
    WHERE transaction_id = NEW.transaction_id;

    IF v_transaction.transaction_id IS NULL THEN
        RAISE EXCEPTION 'Transaction with id % does not exist',
NEW.transaction_id;
        RETURN OLD;
    END IF;

    SELECT * INTO v_wallet
    FROM "home budget application".wallets
    WHERE wallet_id = NEW.wallet_id;

    IF v_wallet.wallet_id IS NULL THEN
        RAISE EXCEPTION 'Wallet with id % does not exist', NEW.wallet_id;
        RETURN OLD;
    END IF;

    -- Get dollar rate from transaction currency
    SELECT dollar_rate INTO v_in_dollar_rate
    FROM "home budget application".currency
    WHERE currency_id = v_transaction.currency_id;

    -- Get dollar rate of wallet currency
    SELECT dollar_rate INTO v_out_dollar_rate
    FROM "home budget application".currency
    WHERE currency_id = v_wallet.currency_id;

    -- Calculate the transaction value in the wallet currency
    v_calc_value := "home budget application".calc_currency(
        v_in_dollar_rate, v_out_dollar_rate, v_transaction.value
    );

    -- Update the wallet balance based on transaction type
    IF v_transaction.transaction_type = 'withdraw'::"home budget
application".transaction_type THEN
        UPDATE "home budget application".wallets
        SET balance = balance - v_calc_value
        WHERE wallet_id = NEW.wallet_id;
    ELSIF v_transaction.transaction_type = 'deposit'::"home budget
application".transaction_type THEN
```

```
        UPDATE "home budget application".wallets
        SET balance = balance + v_calc_value
        WHERE wallet_id = NEW.wallet_id;
    END IF;

    RETURN NEW;
END;
$$ LANGUAGE plpgsql;
```

Cel: Ta funkcja triggera aktualizuje bilans portfela na podstawie nowych transakcji. Obsługuje zarówno transakcje typu withdraw, jak i deposit.

Parametry: Brak.

Zwraca: Nowy rząd w tabeli users_groups_transactions.

API

add currency

```
CREATE OR REPLACE FUNCTION "home budget application".add_currency(
    p_currency_name VARCHAR,
    p_currency_short CHAR(3),
    p_dollar_rate NUMERIC
) RETURNS "home budget application".currency AS $$
DECLARE
    v_currency "home budget application".currency%ROWTYPE;
BEGIN
    INSERT INTO "home budget application".currency (
        currency_name, currency_short, dollar_rate
    ) VALUES (
        p_currency_name, p_currency_short, p_dollar_rate
    ) RETURNING * INTO v_currency;

    RETURN v_currency;
END;
$$ LANGUAGE plpgsql;
```

Cel: Dodaje nową walutę do tabeli currency.

Parametry:

- `p_currency_name`: Nazwa waluty.
- `p_currency_short`: Skrócona forma (kod) waluty.
- `p_dollar_rate`: Kurs wymiany waluty w dolarach.

Zwraca: Nowo wstawiony rząd z tabeli currency.

add country

```
CREATE OR REPLACE FUNCTION "home budget application".add_country(
    p_country_name character varying,
    p_country_code character,
    p_currency_short character
)
RETURNS "home budget application".countries
LANGUAGE plpgsql
AS $function$
DECLARE
    v_country "home budget application".countries%ROWTYPE;
    v_currency_id INTEGER;
BEGIN
    -- Check if the currency exists
    SELECT currency_id INTO v_currency_id
    FROM "home budget application".currency
    WHERE currency_short = p_currency_short;

    -- If the currency ID is null, raise an exception and do not insert the
country
    IF v_currency_id IS NULL THEN
        RAISE EXCEPTION 'Currency with short code % does not exist',
p_currency_short;
        RETURN NULL;
    END IF;

    -- Insert the country if the currency exists
    INSERT INTO "home budget application".countries (
        country_name, country_code, currency_id
    ) VALUES (
        p_country_name, p_country_code, v_currency_id
    ) RETURNING * INTO v_country;

    RETURN v_country;
END;
$function$
;
```

Cel: Dodaje nowy kraj do tabeli countries.

Parametry:

- `p_country_name`: Nazwa kraju.
- `p_country_code`: Kod kraju.
- `p_currency_short`: Kod skrótu waluty używanej w kraju.

Zwraca: Nowo wstawiony rząd z tabeli countries.

add category

```
CREATE OR REPLACE FUNCTION "home budget application".add_category(
    p_category_name character varying,
    p_category_description character varying
)
RETURNS "home budget application".categories
LANGUAGE plpgsql
AS $function$
DECLARE
    v_category "home budget application".categories%ROWTYPE;
BEGIN
    -- Insert the category
    INSERT INTO "home budget application".categories (
        category_name, category_description
    ) VALUES (
        p_category_name, p_category_description
    ) RETURNING * INTO v_category;

    RETURN v_category;
END;
$function$
;
```

Cel: Dodaje nową kategorię do tabeli categories.

Parametry:

- `p_category_name`: Nazwa kategorii.
- `p_category_description`: Opis kategorii.

Zwraca: Nowo wstawiony rząd z tabeli categories.

add subcategory

```
CREATE OR REPLACE FUNCTION "home budget application".add_subcategory(
    p_subcategory_name character varying,
    p_subcategory_description character varying,
    p_category_name character varying
)
RETURNS "home budget application".subcategories
LANGUAGE plpgsql
AS $function$
DECLARE
    v_subcategory "home budget application".subcategories%ROWTYPE;
    v_category_id INTEGER;
BEGIN
    -- Check if the category exists
    SELECT category_id INTO v_category_id
    FROM "home budget application".categories
    WHERE category_name = p_category_name;
```

```
    -- If the category ID is null, raise an exception and do not insert the
subcategory
    IF v_category_id IS NULL THEN
        RAISE EXCEPTION 'Category with name % does not exist', p_category_name;
        RETURN NULL;
    END IF;

    -- Insert the subcategory if the category exists
    INSERT INTO "home budget application".subcategories (
        subcategory_name, subcategory_description, category_id
    ) VALUES (
        p_subcategory_name, p_subcategory_description, v_category_id
    ) RETURNING * INTO v_subcategory;

    RETURN v_subcategory;
END;
$function$
;
```

Cel: Dodaje nową podkategorię do tabeli subcategories.

Parametry:

- `p_subcategory_name`: Nazwa podkategorii.
- `p_subcategory_description`: Opis podkategorii.
- `p_category_name`: Nazwa nadrzędnej kategorii.

Zwraca: Nowo wstawiony rząd z tabeli subcategories.

create user

```
CREATE OR REPLACE FUNCTION "home budget application".create_user(
    p_name VARCHAR,
    p_email VARCHAR,
    p_user_password VARCHAR,
    p_country_short CHAR(3),
    p_surname VARCHAR DEFAULT NULL,
    p_nick_name VARCHAR DEFAULT NULL,
    p_phone_number VARCHAR DEFAULT NULL
)
RETURNS "home budget application".users
LANGUAGE plpgsql
AS $function$
DECLARE
    v_user "home budget application".users%ROWTYPE;
    v_salt VARCHAR := md5(random()::text || clock_timestamp()::text);
    v_hashed_password VARCHAR := md5(p_user_password || v_salt);
    v_country_id INTEGER;
    v_sequence INTEGER := 1;
    v_new_nick_name VARCHAR;
BEGIN
```

```
    -- Check if email has correct syntax
    IF p_email !~ '^[A-Za-z0-9._%+-]+@[A-Za-z0-9.-]+\.[A-Za-z]{2,}$' THEN
        RAISE EXCEPTION 'Invalid email format: %', p_email;
        RETURN NULL;
    END IF;

    -- Lookup country_id based on country_short
    SELECT country_id INTO v_country_id
    FROM "home budget application".countries
    WHERE country_code = p_country_short;

    -- If country_id is null, raise an exception
    IF v_country_id IS NULL THEN
        RAISE EXCEPTION 'Country with short code % does not exist',
p_country_short;
        RETURN NULL;
    END IF;

    -- Generate a unique nick_name if not provided
    IF p_nick_name IS NULL THEN
        v_new_nick_name := p_name || to_char(floor(random() * 9 + 1)::integer,
'FM0000');
        -- Check if the generated nick_name already exists
        WHILE EXISTS (SELECT 1 FROM "home budget application".users WHERE
nick_name = v_new_nick_name) LOOP
            v_sequence := v_sequence + 1;
            v_new_nick_name := p_name || to_char(v_sequence, 'FM0000');
        END LOOP;
        p_nick_name := v_new_nick_name;
    ELSE
        -- Check if the provided nick_name already exists
        WHILE EXISTS (SELECT 1 FROM "home budget application".users WHERE
nick_name = p_nick_name) LOOP
            v_sequence := v_sequence + 1;
            p_nick_name := p_nick_name || to_char(v_sequence, 'FM0000');
        END LOOP;
    END IF;

    -- Insert the new user
    INSERT INTO "home budget application".users (
        name, surname, nick_name, email, phone_number, user_password, salt,
country_id
    ) VALUES (
        p_name, p_surname, p_nick_name, p_email, p_phone_number,
v_hashed_password, v_salt, v_country_id
    ) RETURNING * INTO v_user;

    RETURN v_user;
END;
$function$
```

Cel: Tworzy nowego użytkownika w tabeli users.

Parametry:

- `p_name`: Imię użytkownika.
- `p_email`: Adres email użytkownika.
- `p_user_password`: Hasło użytkownika.
- `p_country_short`: Skrót kraju.
- `p_surname`: Nazwisko użytkownika (opcjonalne).
- `p_nick_name`: Nazwa użytkownika (opcjonalne).
- `p_phone_number`: Numer telefonu użytkownika (opcjonalne).

Zwraca: Nowo wstawiony rząd z tabeli users.

login user

CREATE OR REPLACE FUNCTION "home budget application".login_user(p_email VARCHAR, p_user_password VARCHAR) RETURNS TEXT LANGUAGE plpgsql AS $function$ DECLARE v_user "home budget application".users%ROWTYPE; v_session "home budget application".sessions%ROWTYPE; BEGIN -- Retrieve user by email SELECT * INTO v_user FROM "home budget application".users WHERE email = p_email;

```
-- Check if user exists and verify password
IF v_user.user_id IS NULL THEN
    RAISE EXCEPTION 'User with email % does not exist', p_email;
    RETURN NULL;
ELSIF v_user.user_password != md5(p_user_password || v_user.salt) THEN
    RAISE EXCEPTION 'Incorrect password for email %', p_email;
    RETURN NULL;
END IF;

-- Create a new session
INSERT INTO "home budget application".sessions DEFAULT VALUES
RETURNING * INTO v_session;

-- Link the session with the user
INSERT INTO "home budget application".users_sessions (
    session_id, user_id
) VALUES (
    v_session.session_id, v_user.user_id
);

-- Return the session hash
RETURN v_session.hash;
```

END; $function$;

Cel: Funkcja logowania użytkownika, która sprawdza poprawność adresu e-mail i hasła, tworzy nową sesję, a następnie zwraca hash sesji.

Parametry:

- `p_email`: Adres e-mail użytkownika.
- `p_user_password`: Hasło użytkownika.

Zwraca: Hash sesji, jeśli logowanie jest poprawne.

verify session

```
CREATE OR REPLACE FUNCTION "home budget application".verify_session(
    p_session_hash TEXT
)
RETURNS INTEGER
LANGUAGE plpgsql
AS $function$
DECLARE
    v_session "home budget application".sessions%ROWTYPE;
    v_user_id INTEGER;
BEGIN
    -- Retrieve session by session hash
    SELECT * INTO v_session
    FROM "home budget application".sessions
    WHERE hash = p_session_hash;

    -- Check if session exists and is still valid
    IF v_session.session_id IS NULL THEN
        RETURN NULL;
    ELSIF v_session.expiration_time < CURRENT_TIMESTAMP THEN
        RETURN NULL;
    ELSE
        -- Retrieve user_id from users_sessions
        SELECT user_id INTO v_user_id
        FROM "home budget application".users_sessions
        WHERE session_id = v_session.session_id;

        RETURN v_user_id;
    END IF;
END;
$function$
;
```

Cel: Funkcja weryfikująca sesję użytkownika na podstawie hash sesji. Sprawdza, czy sesja istnieje i jest nadal ważna.

Parametry:

- `p_session_hash`: Hash sesji. Zwraca: ID użytkownika, jeśli sesja jest ważna, lub NULL, jeśli sesja wygasła lub nie istnieje.

create wallet

```
CREATE OR REPLACE FUNCTION "home budget application".create_wallet(
    p_session_hash TEXT,
    p_wallet_name VARCHAR,
    p_currency_short CHAR(3)
)
RETURNS "home budget application".wallets
LANGUAGE plpgsql
AS $function$
DECLARE
    v_user_id INTEGER;
    v_wallet "home budget application".wallets%ROWTYPE;
    v_currency_id INTEGER;
BEGIN
    -- Verify session and get user_id
    v_user_id := "home budget application".verify_session(p_session_hash);

    -- If user_id is null, raise an exception
    IF v_user_id IS NULL THEN
        RAISE EXCEPTION 'Invalid or expired session';
        RETURN NULL;
    END IF;

    -- Lookup currency_id based on currency_short
    SELECT currency_id INTO v_currency_id
    FROM "home budget application".currency
    WHERE currency_short = p_currency_short;

    -- If currency_id is null, raise an exception
    IF v_currency_id IS NULL THEN
        RAISE EXCEPTION 'Currency with short code % does not exist',
p_currency_short;
        RETURN NULL;
    END IF;

    -- Create a new wallet
    INSERT INTO "home budget application".wallets (
        wallet_name, currency_id
    ) VALUES (
        p_wallet_name, v_currency_id
    ) RETURNING * INTO v_wallet;

    -- Link the wallet with the user
    INSERT INTO "home budget application".users_wallets (
        wallet_id, user_id
    ) VALUES (
        v_wallet.wallet_id, v_user_id
    );

    -- Return the wallet
    RETURN v_wallet;
END;
$function$
;
```

Cel: Funkcja tworząca nowy portfel użytkownika. Weryfikuje sesję, wyszukuje ID waluty i tworzy nowy portfel, a następnie przypisuje go do użytkownika.

Parametry:

- `p_session_hash`: Hash sesji użytkownika.
- `p_wallet_name`: Nazwa portfela.
- `p_currency_short`: Skrót waluty używanej w portfelu.

Zwraca: Nowo utworzony portfel z tabeli wallets.

join group

```
CREATE OR REPLACE FUNCTION "home budget application".join_group(
    p_session_hash TEXT,
    p_group_id integer,
    p_user_role VARCHAR
)
RETURNS "home budget application".users_groups
LANGUAGE plpgsql
AS $function$
DECLARE
    v_user_id INTEGER;
    v_group "home budget application".groups%ROWTYPE;
    v_users_groups "home budget application".users_groups%ROWTYPE;
BEGIN
    -- Verify session and get user_id
    v_user_id := "home budget application".verify_session(p_session_hash);

    -- If user_id is null, raise an exception
    IF v_user_id IS NULL THEN
        RAISE EXCEPTION 'Invalid or expired session';
        RETURN NULL;
    END IF;

    -- Check if group exists --
    SELECT * INTO v_group
    FROM "home budget application".groups
    WHERE group_id = p_group_id;

    IF v_group IS NULL THEN
        RAISE EXCEPTION 'Group with ID: % does not exist', p_group_id;
        RETURN NULL;
    END IF;

    INSERT INTO "home budget application".users_groups (
        user_role, group_id, user_id
    ) VALUES (
        p_user_role::"home budget application".user_role_in_group, p_group_id,
v_user_id
```

```
    ) RETURNING * INTO v_users_groups;

    RETURN v_users_groups;

END;
$function$
;
```

Cel: Funkcja dołączania użytkownika do grupy. Weryfikuje sesję, sprawdza, czy grupa istnieje, a następnie dodaje użytkownika do grupy z określoną rolą.

Parametry:

- `p_session_hash`: Hash sesji użytkownika.
- `p_group_id`: ID grupy.
- `p_user_role`: Rola użytkownika w grupie.

Zwraca: Nowo dodany rząd z tabeli users_groups.

create group

```
CREATE OR REPLACE FUNCTION "home budget application".create_group(
    p_session_hash TEXT,
    p_group_name VARCHAR,
    p_group_description VARCHAR DEFAULT NULL,
    p_group_photo VARCHAR DEFAULT NULL
)
RETURNS "home budget application".groups
LANGUAGE plpgsql
AS $function$
DECLARE
    v_user_id INTEGER;
    v_group "home budget application".groups%ROWTYPE;
BEGIN
    -- Verify session and get user_id
    v_user_id := "home budget application".verify_session(p_session_hash);

    -- If user_id is null, raise an exception
    IF v_user_id IS NULL THEN
        RAISE EXCEPTION 'Invalid or expired session';
        RETURN NULL;
    END IF;

    -- Creates new group in table groups
    INSERT INTO "home budget application".groups (
        group_name, group_description, group_photo, owner_id
    ) VALUES (
        p_group_name, p_group_description, p_group_photo, v_user_id
    ) RETURNING * INTO v_group;

    -- Adds User to users_groups table with admin permissions
```

```
    PERFORM "home budget application".join_group(p_session_hash, v_group.group_id,
'admin');

    RETURN v_group;

END;
$function$
;
```

Cel: Funkcja tworząca nową grupę. Weryfikuje sesję użytkownika, tworzy nową grupę, a następnie dodaje użytkownika do grupy z rolą administratora.

Parametry:

- `p_session_hash`: Hash sesji użytkownika.
- `p_group_name`: Nazwa grupy.
- `p_group_description`: Opis grupy (opcjonalne).
- `p_group_photo`: Zdjęcie grupy (opcjonalne).

Zwraca: Nowo utworzona grupa z tabeli groups.

change user role in group

```
CREATE OR REPLACE FUNCTION "home budget application".change_user_role_in_group(
    p_session_hash TEXT,
    p_email VARCHAR,
    p_group_id INTEGER,
    p_role VARCHAR
)
RETURNS "home budget application".users_groups
LANGUAGE plpgsql
AS $function$
DECLARE
    v_admin_user_id INTEGER;
    v_target_user_id INTEGER;
    v_users_groups "home budget application".users_groups%ROWTYPE;
BEGIN
    -- Verify session and get admin_user_id
    v_admin_user_id := "home budget application".verify_session(p_session_hash);

    -- If admin_user_id is null, raise an exception
    IF v_admin_user_id IS NULL THEN
        RAISE EXCEPTION 'Invalid or expired session';
        RETURN NULL;
    END IF;

    -- Check if admin user is in the group and has an admin role
    IF NOT EXISTS (
        SELECT 1
        FROM "home budget application".users_groups
        WHERE user_id = v_admin_user_id
```

```
        AND group_id = p_group_id
        AND user_role = 'admin'
    ) THEN
        RAISE EXCEPTION 'User does not have admin permissions in group %',
p_group_id;
        RETURN NULL;
    END IF;

    -- Get the user ID of the target user
    SELECT user_id INTO v_target_user_id
    FROM "home budget application".users
    WHERE email = p_email;

    -- If target user does not exist, raise an exception
    IF v_target_user_id IS NULL THEN
        RAISE EXCEPTION 'User with email % does not exist', p_email;
        RETURN NULL;
    END IF;

    -- Check if the target user is in the specified group
    IF NOT EXISTS (
        SELECT 1
        FROM "home budget application".users_groups
        WHERE user_id = v_target_user_id
        AND group_id = p_group_id
    ) THEN
        RAISE EXCEPTION 'User with email % is not in group %', p_email,
p_group_id;
        RETURN NULL;
    END IF;

    -- Update the user role in the group
    UPDATE "home budget application".users_groups
    SET user_role = p_role::"home budget application".user_role_in_group
    WHERE user_id = v_target_user_id
    AND group_id = p_group_id
    RETURNING * INTO v_users_groups;

    -- Return the updated users_groups row
    RETURN v_users_groups;
END;
$function$
;
```

Cel: Zmienia rolę użytkownika w grupie. Weryfikuje sesję administratora, sprawdza, czy użytkownik ma rolę administratora w grupie, a następnie zmienia rolę określonego użytkownika w grupie.

Parametry:

- `p_session_hash`: Hash sesji administratora.
- `p_email`: Adres email użytkownika, którego rola ma zostać zmieniona.
- `p_group_id`: ID grupy.

- `p_role`: Nowa rola użytkownika w grupie.

Zwraca: Zaktualizowany rząd z tabeli users_groups.

make transaction

```
CREATE OR REPLACE FUNCTION "home budget application".make_transaction(
    p_session_hash TEXT,
    p_wallet_id INTEGER,
    p_value NUMERIC,
    p_currency_short CHAR(3),
    p_transaction_type "home budget application".transaction_type,
    p_category_name VARCHAR,
    p_group_id INTEGER,
    p_subcategory_name VARCHAR DEFAULT NULL
) RETURNS "home budget application".transactions AS $function$
DECLARE
    v_user_id INTEGER;
    v_currency_id INTEGER;
    v_category_id INTEGER;
    v_subcategory_id INTEGER;
    v_transaction "home budget application".transactions%ROWTYPE;
    v_wallet "home budget application".wallets%ROWTYPE;

    v_in_dollar_rate NUMERIC;
    v_out_dollar_rate NUMERIC;
    v_calc_value NUMERIC;
BEGIN
    -- Verify session and get user_id
    v_user_id := "home budget application".verify_session(p_session_hash);

    -- If user_id is null, raise an exception
    IF v_user_id IS NULL THEN
        RAISE EXCEPTION 'Invalid or expired session';
        RETURN NULL;
    END IF;

    -- Retrieve the currency_id
    SELECT currency_id INTO v_currency_id
    FROM "home budget application".currency
    WHERE currency_short = p_currency_short;

    -- If currency_id is null, raise an exception
    IF v_currency_id IS NULL THEN
        RAISE EXCEPTION 'Currency with short code % does not exist',
p_currency_short;
        RETURN NULL;
    END IF;

    -- Retrieve the category_id
    SELECT category_id INTO v_category_id
    FROM "home budget application".categories
```

```
    WHERE category_name = p_category_name;

    -- If v_category_id is null, raise an exception
    IF v_category_id IS NULL THEN
        RAISE EXCEPTION 'Category with name % does not exist', p_category_name;
        RETURN NULL;
    END IF;

    IF p_group_id IS NOT NULL THEN
        IF NOT EXISTS (
            SELECT 1
            FROM "home budget application".groups
            WHERE group_id = p_group_id
        ) THEN
            RAISE EXCEPTION 'Group with id % does not exist', p_group_id;
            RETURN NULL;
        END IF;
    END IF;

    -- Retrieve the subcategory_id (if provided)
    IF p_subcategory_name IS NOT NULL THEN
        SELECT subcategory_id INTO v_subcategory_id
        FROM "home budget application".subcategories
        WHERE subcategory_name = p_subcategory_name
        AND category_id = v_category_id;
    ELSE
        v_subcategory_id := NULL;
    END IF;

    -- Check if wallet exists and retrieve balance
    SELECT * INTO v_wallet
    FROM "home budget application".wallets
    WHERE wallet_id = p_wallet_id;

    IF v_wallet.wallet_id IS NULL THEN
        RAISE EXCEPTION 'Wallet with id % does not exist', p_wallet_id;
        RETURN NULL;
    END IF;

    -- Get dollar rates for currency conversion
    SELECT dollar_rate INTO v_in_dollar_rate
    FROM  "home budget application".currency
    WHERE currency_id = v_currency_id;

    SELECT dollar_rate INTO v_out_dollar_rate
    FROM  "home budget application".currency
    WHERE currency_id = v_wallet.currency_id;

    -- Calculate transaction value in wallet currency
    v_calc_value := "home budget application".calc_currency(v_in_dollar_rate,
v_out_dollar_rate, p_value);

    -- Check if there are sufficient funds for a withdrawal
    IF p_transaction_type = 'withdraw' AND v_wallet.balance < v_calc_value THEN
```

```
        RAISE EXCEPTION 'Insufficient funds in wallet id %', p_wallet_id;
        RETURN NULL;
    END IF;

    -- Insert the transaction into the transactions table
    INSERT INTO "home budget application".transactions (
        value, currency_id, transaction_type, category_id, subcategory_id
    ) VALUES (
        p_value, v_currency_id, p_transaction_type, v_category_id,
v_subcategory_id
    ) RETURNING * INTO v_transaction;

    -- Insert into users_groups_transactions
    INSERT INTO "home budget application".users_groups_transactions (
        user_id, wallet_id, transaction_id, group_id
    ) VALUES (
        v_user_id, p_wallet_id, v_transaction.transaction_id, p_group_id
    );

    RETURN v_transaction;
END;
$function$
LANGUAGE plpgsql;
```

Cel: Tworzenie transakcji, która sprawdza poprawność sesji użytkownika, pobiera odpowiednie ID waluty, kategorii i podkategorii, sprawdza dostępność środków w portfelu i tworzy transakcję oraz łączy ją z użytkownikiem i grupą, jeśli istnieje.

Parametry:

- `p_session_hash`: Hash sesji użytkownika.
- `p_wallet_id`: ID portfela.
- `p_value`: Wartość transakcji.
- `p_currency_short`: Kod waluty.
- `p_transaction_type`: Typ transakcji ("withdraw" lub "deposit").
- `p_category_name`: Nazwa kategorii.
- `p_group_id`: ID grupy.
- `p_subcategory_name`: Nazwa podkategorii (opcjonalne).

Zwraca: Nowo utworzona transakcja z tabeli transactions.