Курсов проект
По
Управление на данни

Изработил: Проверил:

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Факултетен номер: 19621820

Дисциплина: Управление на данни.

Задание УД

Да се проектира и реализира база от данни за **БАНКА**, която да съхранява следната информация:

- Клиент – име, ЕГН, адрес, телефон:
- Служител – име, позиция, телефон:
- Сметка – номер, клиент, вид валута, лихва, наличност:
- Транзакция - вид, клиент, служител, сметка, сума.

Правила:
- Всеки клиент може да има повече от една сметка
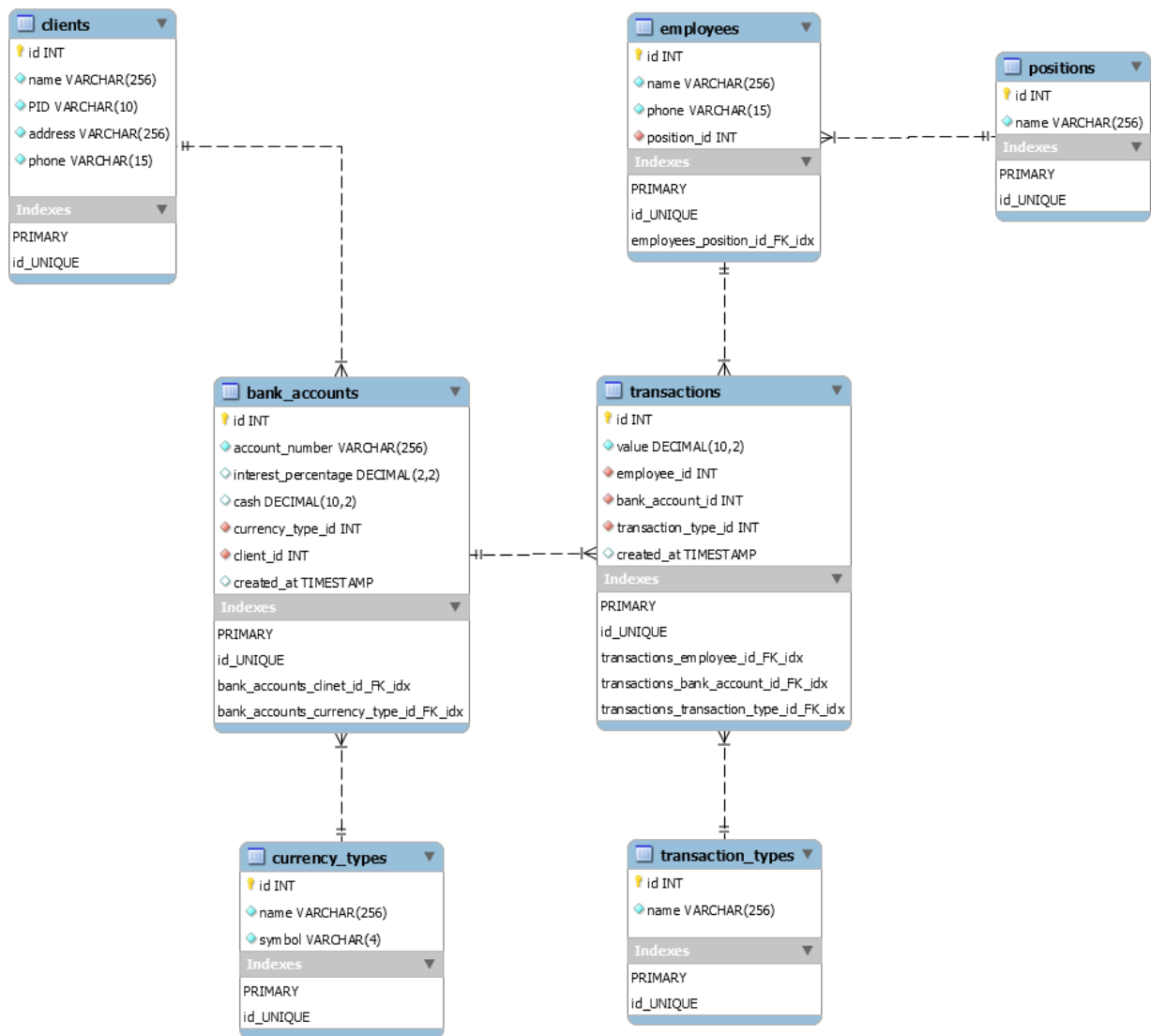- Всеки клиент може да прави транзакции от различен вид

Базата от данни трябва да е **нормализирана** и да позволява:

1. **Въвеждане и корекции** на данни.
2. **Търсене** на сметки по: клиент, номер, ЕГН.
3. **Справки** за:
    - сметки на клиент;
    - транзакции на клиент, подредени по дата;
    - транзакции за служител;
    - транзакции за период.

Обяснителната записка към проекта трябва да съдържа:
- Задание
- Модели (Oracle Data Moduler)   - 6 седмица
- Примерни данни   -10 седмица
- SQL команди – DLL,DML
- Резултати от изпълнението на заявките   -12 седмица

Релационен модел:

clients
- 🔑 id INT
- ◆ name VARCHAR(256)
- ◆ PID VARCHAR(10)
- ◆ address VARCHAR(256)
- ◆ phone VARCHAR(15)

Indexes
- PRIMARY
- id_UNIQUE

employees
- 🔑 id INT
- ◆ name VARCHAR(256)
- ◆ phone VARCHAR(15)
- ◆ position_id INT

Indexes
- PRIMARY
- id_UNIQUE
- employees_position_id_FK_idx

positions
- 🔑 id INT
- ◆ name VARCHAR(256)

Indexes
- PRIMARY
- id_UNIQUE

bank_accounts
- 🔑 id INT
- ◆ account_number VARCHAR(256)
- ◇ interest_percentage DECIMAL(2,2)
- ◇ cash DECIMAL(10,2)
- ◆ currency_type_id INT
- ◆ client_id INT
- ◇ created_at TIMESTAMP

Indexes
- PRIMARY
- id_UNIQUE
- bank_accounts_clinet_id_FK_idx
- bank_accounts_currency_type_id_FK_idx

transactions
- 🔑 id INT
- ◆ value DECIMAL(10,2)
- ◆ employee_id INT
- ◆ bank_account_id INT
- ◆ transaction_type_id INT
- ◇ created_at TIMESTAMP

Indexes
- PRIMARY
- id_UNIQUE
- transactions_employee_id_FK_idx
- transactions_bank_account_id_FK_idx
- transactions_transaction_type_id_FK_idx

currency_types
- 🔑 id INT
- ◆ name VARCHAR(256)
- ◆ symbol VARCHAR(4)

Indexes
- PRIMARY
- id_UNIQUE

transaction_types
- 🔑 id INT
- ◆ name VARCHAR(256)

Indexes
- PRIMARY
- id_UNIQUE

КОД НА ПРОГРАМАТА

Създаване на таблици:

```sql
SET @OLD_UNIQUE_CHECKS = @@UNIQUE_CHECKS,
  UNIQUE_CHECKS = 0;
SET @OLD_FOREIGN_KEY_CHECKS = @@FOREIGN_KEY_CHECKS,
  FOREIGN_KEY_CHECKS = 0;
-- -----------------------------------------------------
-- Schema uni-db
-- -----------------------------------------------------
CREATE SCHEMA IF NOT EXISTS `uni_db` DEFAULT CHARACTER SET utf8;
USE `uni_db`;
-- -----------------------------------------------------
-- Table `bank_accounts`
-- -----------------------------------------------------
DROP TABLE IF EXISTS `bank_accounts`;
CREATE TABLE IF NOT EXISTS `bank_accounts` (
  `id` INT NOT NULL AUTO_INCREMENT,
  `account_number` VARCHAR(256) NOT NULL,
  `interest_percentage` DECIMAL(5, 2) NULL DEFAULT 0,
  `cash` DECIMAL(12, 2) NULL DEFAULT 0,
  `currency_type_id` INT NOT NULL,
  `client_id` INT NOT NULL,
  `created_at` TIMESTAMP NULL DEFAULT CURRENT_TIMESTAMP,
  PRIMARY KEY (`id`),
  UNIQUE INDEX `id_UNIQUE` (`id` ASC) VISIBLE,
  INDEX `bank_accounts_clinet_id_FK_idx` (`client_id` ASC) VISIBLE,
  INDEX `bank_accounts_currency_type_id_FK_idx` (`currency_type_id` ASC)
VISIBLE,
  CONSTRAINT `bank_accounts_clinet_id_FK` FOREIGN KEY (`client_id`) REFER
ENCES `clients` (`id`) ON DELETE NO ACTION ON UPDATE NO ACTION,
  CONSTRAINT `bank_accounts_currency_type_id_FK` FOREIGN KEY (`currency_t
ype_id`) REFERENCES `currency_types` (`id`) ON DELETE NO ACTION ON UPDATE
 NO ACTION
) ENGINE = InnoDB;
-- -----------------------------------------------------
-- Table `clients`
-- -----------------------------------------------------
DROP TABLE IF EXISTS `clients`;
CREATE TABLE IF NOT EXISTS `clients` (
  `id` INT NOT NULL AUTO_INCREMENT,
  `name` VARCHAR(256) NOT NULL,
  `PID` VARCHAR(10) NOT NULL,
  `address` VARCHAR(256) NOT NULL,
  `phone` VARCHAR(15) NOT NULL,
  PRIMARY KEY (`id`),
  UNIQUE INDEX `id_UNIQUE` (`id` ASC) VISIBLE
) ENGINE = InnoDB;
-- -----------------------------------------------------
-- Table `currency_types`
-- -----------------------------------------------------
```

```sql
DROP TABLE IF EXISTS `currency_types`;
CREATE TABLE IF NOT EXISTS `currency_types` (
  `id` INT NOT NULL AUTO_INCREMENT,
  `name` VARCHAR(256) NOT NULL,
  `symbol` VARCHAR(4) NOT NULL,
  PRIMARY KEY (`id`),
  UNIQUE INDEX `id_UNIQUE` (`id` ASC) VISIBLE
) ENGINE = InnoDB;
-- -------------------------------------------------------
-- Table `employees`
-- -------------------------------------------------------
DROP TABLE IF EXISTS `employees`;
CREATE TABLE IF NOT EXISTS `employees` (
  `id` INT NOT NULL AUTO_INCREMENT,
  `name` VARCHAR(256) NOT NULL,
  `phone` VARCHAR(15) NOT NULL,
  `position_id` INT NOT NULL,
  PRIMARY KEY (`id`),
  UNIQUE INDEX `id_UNIQUE` (`id` ASC) VISIBLE,
  INDEX `employees_position_id_FK_idx` (`position_id` ASC) VISIBLE,
  CONSTRAINT `employees_position_id_FK` FOREIGN KEY (`position_id`) REFER
ENCES `positions` (`id`) ON DELETE NO ACTION ON UPDATE NO ACTION
) ENGINE = InnoDB;
-- -------------------------------------------------------
-- Table `positions`
-- -------------------------------------------------------
DROP TABLE IF EXISTS `positions`;
CREATE TABLE IF NOT EXISTS `positions` (
  `id` INT NOT NULL AUTO_INCREMENT,
  `name` VARCHAR(256) NOT NULL,
  PRIMARY KEY (`id`),
  UNIQUE INDEX `id_UNIQUE` (`id` ASC) VISIBLE
) ENGINE = InnoDB;
-- -------------------------------------------------------
-- Table `transaction_types`
-- -------------------------------------------------------
DROP TABLE IF EXISTS `transaction_types`;
CREATE TABLE IF NOT EXISTS `transaction_types` (
  `id` INT NOT NULL AUTO_INCREMENT,
  `name` VARCHAR(256) NOT NULL,
  PRIMARY KEY (`id`),
  UNIQUE INDEX `id_UNIQUE` (`id` ASC) VISIBLE
) ENGINE = InnoDB;
-- -------------------------------------------------------
-- Table `transactions`
-- -------------------------------------------------------
DROP TABLE IF EXISTS `transactions`;
CREATE TABLE IF NOT EXISTS `transactions` (
  `id` INT NOT NULL AUTO_INCREMENT,
  `value` DECIMAL(12, 2) NOT NULL,
  `employee_id` INT NOT NULL,
  `bank_account_id` INT NOT NULL,
  `transaction_type_id` INT NOT NULL,
  `created_at` TIMESTAMP NULL DEFAULT CURRENT_TIMESTAMP,
  PRIMARY KEY (`id`),
```

```sql
  UNIQUE INDEX `id_UNIQUE` (`id` ASC) VISIBLE,
  INDEX `transactions_employee_id_FK_idx` (`employee_id` ASC) VISIBLE,
  INDEX `transactions_bank_account_id_FK_idx` (`bank_account_id` ASC) VIS
IBLE,
  INDEX `transactions_transaction_type_id_FK_idx` (`transaction_type_id`
ASC) VISIBLE,
  CONSTRAINT `transactions_employee_id_FK` FOREIGN KEY (`employee_id`) RE
FERENCES `employees` (`id`) ON DELETE NO ACTION ON UPDATE NO ACTION,
  CONSTRAINT `transactions_bank_account_id_FK` FOREIGN KEY (`bank_account
_id`) REFERENCES `bank_accounts` (`id`) ON DELETE NO ACTION ON UPDATE NO
ACTION,
  CONSTRAINT `transactions_transaction_type_id_FK` FOREIGN KEY (`transact
ion_type_id`) REFERENCES `transaction_types` (`id`) ON DELETE NO ACTION O
N UPDATE NO ACTION
) ENGINE = InnoDB;
SET FOREIGN_KEY_CHECKS = @OLD_FOREIGN_KEY_CHECKS;
SET UNIQUE_CHECKS = @OLD_UNIQUE_CHECKS;
```

Въвеждане на данни:

```sql
INSERT INTO currency_types(`name`, `symbol`)
VALUES ('Bulgarian lev', 'лв.'),
  ('Euro', '€'),
  ('United States dollar', '$'),
  ('Japanese yen', '¥'),
  ('Pound sterling', '£');

INSERT INTO positions(`name`)
VALUES ('Financial Analyst'),
  ('Personal Financial Adviser'),
  ('Relationship Manager'),
  ('Accountant'),
  ('Auditor'),
  ('Branch Manager'),
  ('Loan Officer'),
  ('Bank Teller'),
  ('Treasurer');

INSERT INTO `transaction_types` (`name`)
VALUES ('ATM'),
  ('Charge'),
  ('Check'),
  ('Deposit'),
  ('Online'),
  ('POS'),
  ('Transfer'),
  ('Withdrawal');

INSERT INTO `employees` (`name`, `phone`, `position_id`)
VALUES ('Kira', '(811) 603-3553 ', 2),
  ('Richie', '1-254-758-9289 ', 2),
```

```sql
  ('Aron', '(981) 125-7840 ', 4),
  ('Einar', '543-454-6131 x3', 2),
  ('Susie', '(409) 342-3282 ', 2),
  ('Jude', '(941) 466-7445', 8),
  ('Myron', '495-661-2319 x8', 4),
  ('Buddy', '268.920.8951 x3', 6),
  ('Estelle', '014.887.9639', 2),
  ('Rozella', '855-772-9774', 6),
  ('Zechariah', '091.850.0465', 6),
  ('Waldo', '956-785-6519', 8),
  ('Magnus', '042.479.7215 x4', 1),
  ('Adelle', '1-373-867-7694 ', 4),
  ('Caden', '(223) 881-3367 ', 6),
  ('Abigale', '(186) 295-1926 ', 1),
  ('Dalton', '1-048-613-7598', 1),
  ('Marlee', '996.514.1756', 1),
  ('Golda', '969.495.4681 x1', 2),
  ('Pearline', '(891) 587-8054', 5);

INSERT INTO `clients` (`name`, `PID`, `address`, `phone`)
VALUES
  ('Zachariah','5571331562',"711 O'Reilly Isle",'(595) 972-3473 '),
  ('Brice','8843493664','764 Carol Brook','446.806.1226'),
  ('Wilmer','5193941889','226 Runte Forge','084.215.7845'),
  ('Aida','4332184394','455 Emmitt Alley','(593) 039-2198 '),
  ('Jamel','6309316599','54932 Murray Hollow','983.518.5074 x9'),
  ('Maximillian','5567833368','359 Raegan Glen','1-784-435-3870 '),
  ('Beth','2370949112','04141 Medhurst Vista','026.729.9501 x3'),
  ('Murl','3091585099','82008 Zieme Point','1-306-517-7342'),
  ('Kelly','1016692048','0512 Hayes Drives','1-970-052-3206'),
  ('Michaela','3910427894','3200 Bednar Road','1-240-482-0781 ');

INSERT INTO `bank_accounts` (`account_number`,`interest_percentage`,`cash
`,`currency_type_id`,`client_id`,`created_at`)
VALUES
  ('6809731976','0.9','5451720.00',4,2,'2020-11-01 09:13:25'),
  ('1676134712','0.00','349400.00',4,10,'2020-11-01 11:27:35'),
  ('6125776066','5.00','8231553.00',4,6,'2020-11-01 00:02:09'),
  ('5647485326','6.00','6327175.00',5,1,'2020-10-31 22:13:41'),
  ('3897456539','0.01','4949436.00',5,10,'2020-11-01 09:31:44'),
  ('1967620069','0.20','6026268.00',3,2,'2020-11-01 07:52:49'),
  ('2501141516','0.90','6650693.00',1,8,'2020-10-31 19:26:52'),
  ('7739475419','0.65','5660381.00',3,7,'2020-11-01 11:53:21'),
  ('1427876257','0.34','6795946.00',2,9,'2020-11-01 12:34:07'),
  ('5494223126','2.25','3406630.00',3,5,'2020-10-31 15:10:29');

INSERT INTO `transactions` (`value`,`employee_id`,`bank_account_id`,`tran
saction_type_id`,`created_at`)
VALUES ('68.00', 14, 5, 8, '2020-11-01 00:49:01'),
  ('105.00', 14, 4, 1, '2020-11-01 10:47:53'),
  ('562.00', 20, 3, 3, '2020-11-01 01:29:42'),
  ('437.00', 10, 7, 5, '2020-11-01 04:11:04'),
  ('717.00', 19, 6, 5, '2020-10-31 14:49:45'),
  ('330.00', 18, 2, 7, '2020-10-31 17:26:45'),
  ('823.00', 16, 3, 5, '2020-10-31 18:44:02'),
```

```
('616.00', 14, 7, 4, '2020-11-01 03:55:59'),
('299.00', 10, 5, 6, '2020-10-31 22:38:21'),
('416.00', 18, 7, 8, '2020-11-01 12:25:09'),
('388.00', 16, 8, 3, '2020-11-01 08:30:56'),
('865.00', 13, 8, 4, '2020-10-31 16:37:29'),
('519.00', 12, 6, 1, '2020-10-31 14:27:55'),
('286.00', 2, 4, 5, '2020-11-01 00:20:36'),
('779.00', 6, 1, 1, '2020-11-01 07:45:55'),
('345.00', 18, 9, 5, '2020-11-01 13:08:42'),
('182.00', 11, 1, 2, '2020-10-31 21:28:56'),
('304.00', 5, 6, 5, '2020-11-01 06:30:39'),
('608.00', 9, 4, 3, '2020-11-01 02:37:12'),
('129.00', 9, 2, 6, '2020-11-01 11:39:43'),
('976.00', 12, 9, 8, '2020-10-31 15:29:51'),
('61.00', 10, 7, 6, '2020-11-01 00:49:14'),
('374.00', 6, 5, 8, '2020-10-31 21:49:55'),
('417.00', 9, 1, 6, '2020-11-01 06:39:08'),
('999.00', 16, 7, 5, '2020-11-01 11:14:26'),
('347.00', 6, 4, 7, '2020-10-31 18:07:19'),
('345.00', 5, 2, 2, '2020-11-01 05:26:54'),
('993.00', 8, 8, 8, '2020-10-31 22:33:26'),
('482.00', 4, 8, 5, '2020-10-31 18:18:46'),
('707.00', 5, 1, 1, '2020-10-31 13:37:41'),
('592.00', 6, 8, 3, '2020-11-01 00:53:52'),
('495.00', 6, 3, 3, '2020-11-01 08:20:30'),
('901.00', 1, 2, 1, '2020-10-31 15:07:57'),
('488.00', 11, 4, 5, '2020-11-01 05:01:19'),
('696.00', 18, 2, 7, '2020-11-01 02:38:29'),
('832.00', 17, 4, 3, '2020-10-31 15:19:13'),
('803.00', 11, 1, 5, '2020-11-01 04:34:38'),
('420.00', 7, 7, 7, '2020-10-31 15:22:25'),
('188.00', 1, 8, 1, '2020-11-01 03:58:50'),
('116.00', 20, 6, 1, '2020-11-01 12:09:24'),
('610.00', 4, 7, 6, '2020-11-01 08:34:48'),
('546.00', 6, 9, 7, '2020-11-01 08:06:13'),
('235.00', 11, 6, 5, '2020-11-01 01:36:25'),
('124.00', 11, 3, 8, '2020-11-01 01:07:14'),
('641.00', 16, 9, 2, '2020-10-31 13:50:24'),
('638.00', 9, 8, 1, '2020-10-31 16:37:26'),
('736.00', 9, 2, 8, '2020-10-31 20:59:14'),
('40.00', 9, 10, 7, '2020-10-31 20:51:02'),
('164.00', 13, 8, 4, '2020-11-01 06:51:43'),
('776.00', 16, 8, 1, '2020-10-31 17:09:50');
```

Търсене на сметки по: номер

```sql
SELECT bank_accounts.account_number,
  clients.name,
  bank_accounts.interest_percentage,
  CASE
    WHEN currency_types.id = 1 THEN CONCAT(bank_accounts.cash, currency_t
ypes.symbol)
    ELSE CONCAT(currency_types.symbol, bank_accounts.cash)
  END as cash,
  bank_accounts.created_at
FROM bank_accounts
  INNER JOIN clients ON clients.id = bank_accounts.client_id
  INNER JOIN currency_types ON currency_types.id = bank_accounts.currency
_type_id
WHERE bank_accounts.account_number = '5647485326';
```

name	interest_percentage	cash	created_at
Zachariah	6.00	£6327175.00	2020-10-31 22:13:41

Търсене на сметки по: ЕГН

```sql
SELECT bank_accounts.account_number,
  clients.name,
  bank_accounts.interest_percentage,
  CASE
    WHEN currency_types.id = 1 THEN CONCAT(bank_accounts.cash, currency_t
ypes.symbol)
    ELSE CONCAT(currency_types.symbol, bank_accounts.cash)
  END as cash,
  bank_accounts.created_at
FROM bank_accounts
  INNER JOIN clients ON clients.id = bank_accounts.client_id
  INNER JOIN currency_types ON currency_types.id = bank_accounts.currency
_type_id
WHERE clients.PID = '5571331562';
```

account_number	name	interest_percentage	cash	created_at
5647485326	Zachariah	6.00	£6327175.00	2020-10-31 22:13:41

Справка за сметки на клиент:

```sql
SELECT bank_accounts.account_number,
  bank_accounts.interest_percentage,
  CASE
    WHEN currency_types.id = 1 THEN CONCAT(bank_accounts.cash, currency_types.symbol)
    ELSE CONCAT(currency_types.symbol, bank_accounts.cash)
  END as cash,
  bank_accounts.created_at
FROM bank_accounts
  INNER JOIN clients ON clients.id = bank_accounts.client_id
  INNER JOIN currency_types ON currency_types.id = bank_accounts.currency_type_id
WHERE clients.name LIKE '%Michaela%';
```

account_number	interest_percentage	cash	created_at
1676134712	0.00	¥349400.00	2020-11-01 11:27:35
3897456539	0.01	£4949436.00	2020-11-01 09:31:44

Справка за транзакции на клиент, подредени по дата:

```sql
SELECT transactions.*
FROM transactions
  INNER JOIN bank_accounts ON transactions.bank_account_id = bank_accounts.id
  INNER JOIN clients ON clients.id = bank_accounts.client_id
WHERE clients.name LIKE '%Zachariah%'
ORDER BY transactions.created_at;
```

id	value	employee_id	bank_account_id	transaction_type_id	created_at
36	832.00	17	4	3	2020-10-31 15:19:13
26	347.00	6	4	7	2020-10-31 18:07:19
14	286.00	2	4	5	2020-11-01 00:20:36
19	608.00	9	4	3	2020-11-01 02:37:12
34	488.00	11	4	5	2020-11-01 05:01:19
2	105.00	14	4	1	2020-11-01 10:47:53

Справка за транзакции за служител:

```sql
SELECT transactions.*
FROM transactions
  INNER JOIN employees ON employees.id = transactions.employee_id
WHERE employees.name LIKE '%Susie%';
```

id	value	employee_id	bank_account_id	transaction_type_id	created_at
18	304.00	5	6	5	2020-11-01 06:30:39
27	345.00	5	2	2	2020-11-01 05:26:54
30	707.00	5	1	1	2020-10-31 13:37:41

Справка за транзакции за период:

```sql
SELECT clients.name AS client_name,
  employees.name AS employee_name,
  bank_accounts.account_number,
  transactions.value,
  transactions.created_at
FROM transactions
  INNER JOIN bank_accounts ON transactions.bank_account_id = bank_accounts.id
  INNER JOIN clients ON clients.id = bank_accounts.client_id
  INNER JOIN employees ON employees.id = transactions.employee_id
WHERE transactions.created_at BETWEEN '2020-11-1 00:00:00' AND '2020-11-1 05:00:00'
ORDER BY transactions.created_at;
```

client_name	employee_name	account_number	value	created_at
Zachariah	Richie	5647485326	286.00	2020-11-01 00:20:36
Michaela	Adelle	3897456539	68.00	2020-11-01 00:49:01
Murl	Rozella	2501141516	61.00	2020-11-01 00:49:14
Beth	Jude	7739475419	592.00	2020-11-01 00:53:52
Maximillian	Zechariah	6125776066	124.00	2020-11-01 01:07:14
Maximillian	Pearline	6125776066	562.00	2020-11-01 01:29:42
Brice	Zechariah	1967620069	235.00	2020-11-01 01:36:25
Zachariah	Estelle	5647485326	608.00	2020-11-01 02:37:12
Michaela	Marlee	1676134712	696.00	2020-11-01 02:38:29
Murl	Adelle	2501141516	616.00	2020-11-01 03:55:59
Beth	Kira	7739475419	188.00	2020-11-01 03:58:50
Murl	Rozella	2501141516	437.00	2020-11-01 04:11:04
Brice	Zechariah	6809731976	803.00	2020-11-01 04:34:38

Линк към github repo: https://github.com/mish0501/uni-db