

Министерство науки и высшего образования Российской Федерации
федеральное государственное автономное образовательное учреждение высшего
образования
«НАЦИОНАЛЬНЫЙ ИССЛЕДОВАТЕЛЬСКИЙ УНИВЕРСИТЕТ ИТМО»

Отчет

по лабораторной работе по теме: “**Маскировка и анонимизация данных**”

по дисциплине «**Проектирование баз данных**»

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Факультет: ИТиП

Группа: М34051



УНИВЕРСИТЕТ ИТМО

Санкт-Петербург 2023

Ход работы

Исходные данные:

id	username	firstName	surName	middleName	phoneNumber	email	password	sex	familyStatus	status	registrationDate	lastLoginDate
1	user1	John	Doe		+123456789	user1@example.com	password1	MALE		Active	2023-09-26 10:00:00	2023-09-26 10:00:00
3	user15	Sergey	Yurpalov	Nickolayevitch	+78005553535	random@mail.com	password1	MALE	SINGLE	123	2023-09-26 10:00:00	2023-09-26 10:00:00
4	user2	Jane	Smith	Marie	+987654321	user2@example.com	password2	FEMALE	COMPLICATED		2023-09-26 10:15:00	2023-09-26 10:15:00
5	user3	William	Johnson	Henry	+1111111111	user3@example.com	password3	MALE	SINGLE	hello	2023-09-26 10:30:00	2023-09-26 10:30:00
6	user4	Emily	Davis	Rose	+222222222	user4@example.com	password4	MALE	COMPLICATED	world!	2023-09-26 10:45:00	2023-09-26 10:45:00
7	user5	James	Wilson	Lee	+333333333	user5@example.com	password5	FEMALE	SINGLE		2023-09-26 11:00:00	2023-09-26 11:00:00
8	user6	Olivia	Brown	Grace	+444444444	user6@example.com	password6	MALE	SINGLE	this	2023-09-26 11:15:00	2023-09-26 11:15:00
9	user7	Benjamin	Anderson	Samuel	+555555555	user7@example.com	password7	MALE	SINGLE	is	2023-09-26 11:30:00	2023-09-26 11:30:00
10	user8	Sophia	Smith		+666666666	user8@example.com	password8	MALE	COMPLICATED	test	2023-09-26 11:45:00	2023-09-26 11:45:00
11	user9	Liam	Johnson	Michael	+777777777	user9@example.com	password9	FEMALE	SINGLE	message	2023-09-26 12:00:00	2023-09-26 12:00:00
12	user10	Ava	Davis	Rose	+888888888	user10@example.com	password10	MALE	COMPLICATED		2023-09-26 12:15:00	2023-09-26 12:15:00
13	user11	Ethan	Wilson	Lee	+999999999	user11@example.com	password11	MALE	COMPLICATED		2023-09-26 12:30:00	2023-09-26 12:30:00
14	user12	Isabella	Brown		+1010101010	user12@example.com	password12	MALE	SINGLE		2023-09-26 12:45:00	2023-09-26 12:45:00
15	user13	Mason	Anderson	Samuel	+1111111111	user13@example.com	password13	FEMALE	SINGLE		2023-09-26 13:00:00	2023-09-26 13:00:00
16	user14	Emma	Smith	Grace	+1212121212	user14@example.com	password14	FEMALE	COMPLICATED		2023-09-26 13:15:00	2023-09-26 13:15:00
(15 rows)												

Подготовка

```
sudo su - postgres
```

```
psql -h localhost -p 5432 -d "DatabaseArchitectureLabWorks"
```

```
ALTER SYSTEM SET shared_preload_libraries = 'anon';
```

```
sudo systemctl restart postgresql.service
```

```
sudo su - postgres
```

```
psql -h localhost -p 5432 -d "DatabaseArchitectureLabWorks"
```

```
CREATE EXTENSION anon CASCADE;
```

```
SELECT anon.init();
```

```
SET anon.sourceschema TO "DatabaseArchitectureLabWorks";
```

Dynamic Masking

```
SELECT anon.start_dynamic_masking();
```

```
CREATE USER syurpalov WITH PASSWORD '12345';
```

```
SECURITYLABEL FORanon ON ROLE syurpalov IS 'MASKED';
```

```
SECURITYLABEL FORanon ON COLUMN "DatabaseArchitectureLabWorks"."User"."firstName"  
IS 'MASKED WITH FUNCTION anon.fake_first_name()';
```

```
SECURITYLABEL FORanon ON COLUMN "DatabaseArchitectureLabWorks"."User"."surname"  
IS 'MASKED WITH FUNCTION anon.fake_last_name()';
```

```
SECURITYLABEL FORanon ON COLUMN "DatabaseArchitectureLabWorks"."User"."middleName"  
IS 'MASKED WITH VALUE "CONFIDENTIAL"';
```

```
SECURITYLABEL FORanon ON COLUMN "DatabaseArchitectureLabWorks"."User"."phoneNumber"  
IS 'MASKED WITH FUNCTION anon.partial("phoneNumber",2,$$*$$$*$$$,$$,2)';
```

```
SECURITYLABEL FORanon ON COLUMN "DatabaseArchitectureLabWorks"."User"."email"  
IS 'MASKED WITH FUNCTION anon.fake_email()';
```

```
SECURITYLABEL FORanon ON COLUMN "DatabaseArchitectureLabWorks"."User"."password"  
IS 'MASKED WITH FUNCTION anon.hash(password)';
```

```
\c - syurpalov
```

```
SELECT * FROM "User";
```

id	username	firstName	surname	middleName	phoneNumber	email	password	sex	familyStatus	status	registrationDate
1	user1	Kesha	Kuhn	CONFIDENTIAL	+1*****89	michaelsmith@proctor.net	0b14d501a594442a01c6859541bcb3e8164d183d	MALE		Active	2023-09-26 10:00:00
2	user15	Agatha	Paucek	CONFIDENTIAL	+7*****35	terri05@patton-christensen.com	0b14d501a594442a01c6859541bcb3e8164d183d	MALE	SINGLE	123	2023-09-26 10:00:00
3	user2	Julio	Feest	CONFIDENTIAL	+9*****21	jacob92@gmail.com	6cf615d5bcaac778352a0f1f3360d23f02f34ec1	FEMALE	COMPLICATED		2023-09-26 10:15:00
4	user3	Zachariah	Fay	CONFIDENTIAL	+1*****11	nathan34@gmail.com	5906ac361a137e2d286465cd6580ebb5ac3f5ae9	MALE	SINGLE	hello	2023-09-26 10:30:00
5	user4	Daniele	Kerluke	CONFIDENTIAL	+2*****22	stewartjustin@yahoo.com	b97873a40f73abedd8d685a7cd5e5f85e4a9cfb8	MALE	COMPLICATED	world!	2023-09-26 10:45:00
6	user5	Sylvania	Kling	CONFIDENTIAL	+3*****33	davisjanie@brown.info	8b2c86ea9cf2ea4eb517fd1e0b674f399e7fec0f	FEMALE	SINGLE		2023-09-26 11:00:00
7	user6	Georgiann	Rowe	CONFIDENTIAL	+4*****44	fjordan@smith-lawson.com	598a1a400c1dfdf36974e69d7e1bc98593f2e150	MALE	SINGLE	this	2023-09-26 11:15:00
8	user7	Odalys	Heltenreich	CONFIDENTIAL	+5*****55	ohowemcdaniel-mccullough.com	5860830e8f13fc9837539a597d4086bfc0299e54	MALE	SINGLE	is	2023-09-26 11:30:00
9	user8	Lee	Cornier	CONFIDENTIAL	+6*****66	teresaw47@fuller.com	57f3ebab63f156fd8f776ba645a55d96360a15ee	MALE	COMPLICATED	test	2023-09-26 11:45:00
10	user9	Monique	Turner	CONFIDENTIAL	+7*****77	brandon58@thompson-coleman.com	9323dd6780ebcbf3ac87357cc78ba1abfda6cf5e	FEMALE	SINGLE	message	2023-09-26 12:00:00
11	user10	Vashti	Hamill	CONFIDENTIAL	+8*****88	cnoore@yahoo.com	aa489ea03fcac15b5fc63c949ac34e7b0fd17906	MALE	COMPLICATED		2023-09-26 12:15:00
12	user11	Amn	Hilpert	CONFIDENTIAL	+9*****99	negan10@hall.com	53d453b0c08b6b38ae91515dc88d25fbecdd1d60	MALE	COMPLICATED		2023-09-26 12:30:00
13	user12	Malie	Turner	CONFIDENTIAL	+1*****10	tdavis@acevedo.com	b3d17ebbe4f2b75d27b6309cfaae1487b667301a	MALE	SINGLE		2023-09-26 12:45:00
14	user13	Mannie	Grady	CONFIDENTIAL	+1*****11	ltodd@hogan.com	48caa6b68583936afdd78a7bfd7046d2492fad9	FEMALE	SINGLE		2023-09-26 13:00:00
15	user14	Kirlin		CONFIDENTIAL	+1*****12	danielstewart@brewer-goodman.com	c8063e1db9b396ed31a36988639513a1c73a065f	FEMALE	COMPLICATED		2023-09-26 13:15:00

(15 rows)

Generalization

```
CREATE MATERIALIZED VIEW "DatabaseArchitectureLabWorks"."UserLastLoginGeneralized" AS
SELECT
  "username" AS "username",
  anon.generalize_tstzrange("lastLoginDate",'week') AS "lastLoginDate"
FROM "DatabaseArchitectureLabWorks"."User";

SELECT * FROM "DatabaseArchitectureLabWorks"."UserLastLoginGeneralized"
```

username	lastLoginDate
user1	["2023-09-25 00:00:00+03", "2023-10-02 00:00:00+03")
user15	["2023-09-25 00:00:00+03", "2023-10-02 00:00:00+03")
user2	["2023-09-25 00:00:00+03", "2023-10-02 00:00:00+03")
user3	["2023-09-25 00:00:00+03", "2023-10-02 00:00:00+03")
user4	["2023-09-25 00:00:00+03", "2023-10-02 00:00:00+03")
user5	["2023-09-25 00:00:00+03", "2023-10-02 00:00:00+03")
user6	["2023-09-25 00:00:00+03", "2023-10-02 00:00:00+03")
user7	["2023-09-25 00:00:00+03", "2023-10-02 00:00:00+03")
user8	["2023-09-25 00:00:00+03", "2023-10-02 00:00:00+03")
user9	["2023-09-25 00:00:00+03", "2023-10-02 00:00:00+03")
user10	["2023-09-25 00:00:00+03", "2023-10-02 00:00:00+03")
user11	["2023-09-25 00:00:00+03", "2023-10-02 00:00:00+03")
user12	["2023-09-25 00:00:00+03", "2023-10-02 00:00:00+03")
user13	["2023-09-25 00:00:00+03", "2023-10-02 00:00:00+03")
user14	["2023-09-25 00:00:00+03", "2023-10-02 00:00:00+03")
(15 rows)	

Faking

```
CREATE MATERIALIZED VIEW "DatabaseArchitectureLabWorks"."UserCredenitalsGeneralized" AS
```

```
SELECT
```

```
  "username" AS "username",
```

```
  anon.fake_email() AS "email",
```

```
  anon.lorem_ipsum( characters := 20 ) as "password"
```

```
FROM "DatabaseArchitectureLabWorks"."User";
```

```
SELECT * FROM "DatabaseArchitectureLabWorks"."UserCredenitalsGeneralized";
```

username	email	password
user1	alexismckay@harris.com	New here partner cam
user15	maria51@mccarthy.org	Career player thing
user2	xhart@stone-baxter.org	His mean individual
user3	jason56@hotmail.com	Water wrong somebody
user4	kristen64@gmail.com	Mother up probably a
user5	psmith@gmail.com	Often culture throug
user6	vjackson@hotmail.com	Also weight particul
user7	pacejoseph@dudley-lamb.com	Quickly imagine he l
user8	burtonamanda@duarte.net	Improve different id
user9	saunderswayne@hotmail.com	About cell note lot
user10	christysmith@gmail.com	Agreement new fine f
user11	carrierichards@davis.net	Most which usually i
user12	ajennings@boyd-wallace.com	Book ok power church
user13	thomas58@gmail.com	Board Mr bar white a
user14	michael17@yahoo.com	Author travel realiz
(15 rows)		

Partial Scrambling n Generic hashing

```
CREATE MATERIALIZED VIEW "DatabaseArchitectureLabWorks"."UserCredenitalsSafe" AS
```

```
SELECT
```

```
  "username" AS "username",
```

```
  anon.partial_email("email") AS "email",
```

```
  anon.hash("password") as "password"
```

```
FROM "DatabaseArchitectureLabWorks"."User";
```

```
SELECT * FROM "DatabaseArchitectureLabWorks"."UserCredenitalsSafe";
```

username	email	password
user1	us*****@ex*****.com	0b14d501a594442a01c6859541bcb3e8164d183d32937b851835442f69d5c94e
user15	ra*****@ma*****.com	0b14d501a594442a01c6859541bcb3e8164d183d32937b851835442f69d5c94e
user2	us*****@ex*****.com	6cf615d5bcaac778352a8f1f3360d23f02f34ec182e259897fd6ce485d7870d4
user3	us*****@ex*****.com	5906ac361a137e2d286465cd6588ebb5ac3f5ae955001100bc41577c3d751764
user4	us*****@ex*****.com	b97873a40f73abedd8d685a7cd5e5f85e4a9cfb83eac26886640a0813850122b
user5	us*****@ex*****.com	8b2c86ea9cf2ea4eb517fd1e06b74f399e7fec0fef92e3b482a6cf2e2b092023
user6	us*****@ex*****.com	598a1a400c1dfdf36974e69d7e1bc98593f2e15015eed8e9b7e47a83b31693d5
user7	us*****@ex*****.com	5860836e8f13fc9837539a597d4086bfc0299e54ad92148d54538b5c3feefb7c
user8	us*****@ex*****.com	57f3ebab63f156fd8f776ba645a55d96360a15eeffc8b0e4afe4c05fa88219aa
user9	us*****@ex*****.com	9323dd6786ebcbf3ac87357cc78ba1abfda6cf5e55cd01097b90d4a286cac90e
user10	us*****@ex*****.com	aa4a9ea03fcac15b5fc63c949ac34e7b0fd17906716ac3b8e58c599cdc5a52f0
user11	us*****@ex*****.com	53d453b0c08b6b38ae91515dc88d25fbecdd1d6001f022419629df844f8ba433
user12	us*****@ex*****.com	b3d17ebbe4f2b75d27b6309cfaae1487b667301a73951e7d523a039cd2dfe110
user13	us*****@ex*****.com	48caafb68583936afd0d78a7bfd7046d2492fad94f3c485915f74bb60128620d
user14	us*****@ex*****.com	c6863e1db9b396ed31a36988639513a1c73a065fab83681f4b77adb648fac3d6

(15 rows)