

**МИНИСТЕРСТВО ЦИФРОВОГО РАЗВИТИЯ, СВЯЗИ И  
МАССОВЫХ**

**КОММУНИКАЦИЙ РОССИЙСКОЙ ФЕДЕРАЦИИ**

**Ордена Трудового Красного Знамени федеральное  
государственное бюджетное образовательное  
учреждение высшего образования**

**«Московский технический университет связи и информатики»**

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**Кафедра «Математическая кибернетика и информационные  
технологии»**

**Лабораторная работа № 3**

**Создание базы данных**

**по дисциплине**

**«Введение в информационные технологии»**

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**Проверил:**

**Москва, 2023 г**

# Устанавливаем postgresql

```
Activities Terminal Feb 24 5:01 PM en en sypoo@sypoo-desktop: ~  
sypoo@sypoo-desktop:~$ sudo apt update  
[sudo] password for sypoo:  
Hit:1 https://dl.google.com/linux/chrome/deb stable InRelease  
Get:2 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]  
Get:3 http://security.ubuntu.com/ubuntu jammy-security/main amd64 DEP-11 Metadata [41,6 kB]  
Hit:4 https://ppa.launchpadcontent.net/deadsnakes/ppa/ubuntu jammy InRelease  
Get:5 http://security.ubuntu.com/ubuntu jammy-security/universe amd64 DEP-11 Metadata [15,2 kB]  
Hit:6 http://ru.archive.ubuntu.com/ubuntu jammy InRelease  
Get:7 http://ru.archive.ubuntu.com/ubuntu jammy-updates InRelease [119 kB]  
Get:8 http://ru.archive.ubuntu.com/ubuntu jammy-backports InRelease [107 kB]  
Get:9 http://ru.archive.ubuntu.com/ubuntu jammy-updates/main amd64 DEP-11 Metadata [102 kB]  
Get:10 http://ru.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 DEP-11 Metadata [267 kB]  
Get:11 http://ru.archive.ubuntu.com/ubuntu jammy-updates/multiverse amd64 DEP-11 Metadata [940 B]  
Get:12 http://ru.archive.ubuntu.com/ubuntu jammy-backports/main amd64 DEP-11 Metadata [8 000 B]  
Get:13 http://ru.archive.ubuntu.com/ubuntu jammy-backports/universe amd64 DEP-11 Metadata [12,4 kB]  
Fetched 783 kB in 1s (904 kB/s)  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
10 packages can be upgraded. Run 'apt list --upgradable' to see them.  
sypoo@sypoo-desktop:~$ sudo apt install postgresql postgresql-contrib  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
The following packages were automatically installed and are no longer required:  
  libflashrom1 libftdi1-2 liblvm13  
Use 'sudo apt autoremove' to remove them.  
The following additional packages will be installed:  
  libcommon-sense-perl libjson-perl libjson-xs-perl liblvm14 libpq5 libtypes-serialiser-perl postgresql-14 postgresql-client-14 postgresql-client-common postgresql-common sysstat  
Suggested packages:  
  postgresql-doc postgresql-doc-14 lsg  
The following NEW packages will be installed:  
  libcommon-sense-perl libjson-perl libjson-xs-perl liblvm14 libpq5 libtypes-serialiser-perl postgresql postgresql-14 postgresql-client-14 postgresql-client-common postgresql-common postgresql-contrib sysstat  
0 upgraded, 13 newly installed, 0 to remove and 10 not upgraded.  
Need to get 42,4 MB of archives.  
After this operation, 161 MB of additional disk space will be used.  
Do you want to continue? [Y/n] y  
Get:1 http://ru.archive.ubuntu.com/ubuntu jammy/main amd64 libcommon-sense-perl amd64 3.75-2build1 [21,1 kB]  
Get:2 http://ru.archive.ubuntu.com/ubuntu jammy/main amd64 libjson-perl all 4.04000-1 [81,0 kB]  
Get:3 http://ru.archive.ubuntu.com/ubuntu jammy/main amd64 libtypes-serialiser-perl all 1.01-1 [11,0 kB]  
Get:4 http://ru.archive.ubuntu.com/ubuntu jammy/main amd64 libjson-xs-perl amd64 4.030-1build3 [87,2 kB]  
Get:5 http://ru.archive.ubuntu.com/ubuntu jammy/main amd64 liblvm14 amd64 1:14.0.0-1ubuntu1 [24,0 MB]  
Get:6 http://ru.archive.ubuntu.com/ubuntu jammy-updates/main amd64 libpq5 amd64 14.6-0ubuntu0.22.04.1 [141 kB]  
Get:7 http://ru.archive.ubuntu.com/ubuntu jammy/main amd64 postgresql-client-common all 238 [29,6 kB]  
Get:8 http://ru.archive.ubuntu.com/ubuntu jammy-updates/main amd64 postgresql-client-14 amd64 14.6-0ubuntu0.22.04.1 [1 219 kB]  
Get:9 http://ru.archive.ubuntu.com/ubuntu jammy/main amd64 postgresql-common all 238 [169 kB]  
Get:10 http://ru.archive.ubuntu.com/ubuntu jammy-updates/main amd64 postgresql-14 amd64 14.6-0ubuntu0.22.04.1 [16,1 MB]  
Get:11 http://ru.archive.ubuntu.com/ubuntu jammy/main amd64 postgresql all 14+238 [3 288 B]  
Get:12 http://ru.archive.ubuntu.com/ubuntu jammy/main amd64 postgresql-contrib all 14+238 [3 292 B]  
Get:13 http://ru.archive.ubuntu.com/ubuntu jammy-updates/main amd64 sysstat amd64 12.5.2-2ubuntu0.1 [487 kB]  
Fetched 42,4 MB in 4s (11,3 MB/s)  
Preconfiguring packages ...  
Selecting previously unselected package libcommon-sense-perl:amd64.  
(Reading database ... 199902 files and directories currently installed.)  
Preparing to unpack .../00-libcommon-sense-perl_3.75-2build1_amd64.deb ...  
Unpacking libcommon-sense-perl:amd64 (3.75-2build1) ...
```

# Проверяем все ли работает

```
Activities Terminal Feb 24 5:05 PM en en sypoo@sypoo-desktop: ~  
sypoo@sypoo-desktop:~$ service postgresql status  
Command 'service' not found, did you mean:  
command 'service' from deb init-system-helpers (1.62)  
Try: sudo apt install <deb name>  
sypoo@sypoo-desktop:~$ service postgresql status  
● postgresql.service - PostgreSQL RDBMS  
   Loaded: loaded (/lib/systemd/system/postgresql.service; enabled; vendor preset: enabled)  
   Active: active (exited) since Fri 2023-02-24 17:01:26 MSK; 1min 54s ago  
   Process: 41706 ExecStart=/bin/true (code=exited, status=0/SUCCESS)  
   Main PID: 41706 (code=exited, status=0/SUCCESS)  
   CPU: 1ms  
  
Feb 24 17:01:26 sypoo-desktop systemd[1]: Starting PostgreSQL RDBMS...  
Feb 24 17:01:26 sypoo-desktop systemd[1]: Finished PostgreSQL RDBMS.  
sypoo@sypoo-desktop:~$ sudo -l -u postgres  
postgres@sypoo-desktop:~$ psql  
psql (14.6 (Ubuntu 14.6-0ubuntu0.22.04.1))  
Type "help" for help.  
  
postgres=#
```

# Знакомимся с основными командами

```
Activities Terminal Feb 24 0:23 PM sypoo@sypoo-desktop: ~  
sypoo@sypoo-desktop:~$ sudo -i -u postgres  
[sudo] password for sypoo:  
postgres@sypoo-desktop:~$ psql  
Command 'psql' not found, did you mean:  
  command 'psql' from deb postgresql-client-common (238)  
  command 'tqsl' from deb trustedqsl (2.5.9-2)  
  command 'psl' from deb psl (0.21.0-1.2build2)  
Try: apt install <deb name>  
postgres@sypoo-desktop:~$ psql  
psql (14.6 (Ubuntu 14.6-0ubuntu0.22.04.1))  
Type "help" for help.  
  
postgres=# \d  
Did not find any relations.  
postgres=# \l  


| Name        | Owner    | Encoding | Collate     | Ctype       | Access privileges     |
|-------------|----------|----------|-------------|-------------|-----------------------|
| VVIT_LABA_3 | postgres | UTF8     | en_US.UTF-8 | en_US.UTF-8 |                       |
| mtuci_db    | postgres | UTF8     | en_US.UTF-8 | en_US.UTF-8 |                       |
| postgres    | postgres | UTF8     | en_US.UTF-8 | en_US.UTF-8 |                       |
| template0   | postgres | UTF8     | en_US.UTF-8 | en_US.UTF-8 | =c/postgres           |
| template1   | postgres | UTF8     | en_US.UTF-8 | en_US.UTF-8 | postgres=CTc/postgres |

  
(5 rows)  
  
postgres=#  
postgres=# \c mtuci_db  
You are now connected to database "mtuci_db" as user "postgres".  
mtuci_db=# \d  


| Schema | Name                 | Type     | Owner    |
|--------|----------------------|----------|----------|
| public | student_group        | table    | postgres |
| public | student_group_id_seq | sequence | postgres |

  
(2 rows)  
  
mtuci_db=# select * FROM student_group  
mtuci_db=# SELECT * FROM student_group;  
ERROR: syntax error at or near "SELECT"  
LINE 2: SELECT * FROM student_group  
      ^  
mtuci_db=# SELECT * FROM student_group;  
 id | numb | chair  
-----  
  1 | BBT2001 | МКИИТ  
(1 row)  
  
mtuci_db=# SELECT chair from student_group where numb ='BBT2001';  
 chair  
-----  
 МКИИТ  
(1 row)
```

```
Activities Terminal Feb 24 0:24 PM sypoo@sypoo-desktop: ~  
mtuci_db=# SELECT * FROM student_group  
mtuci_db=# select * from student_group;  
ERROR: syntax error at or near "SELECT"  
LINE 2: SELECT * FROM student_group  
      ^  
mtuci_db=# SELECT * FROM student_group;  
 id | numb | chair  
-----  
  1 | BBT2001 | МКИИТ  
(1 row)  
  
mtuci_db=# SELECT chair from student_group where numb ='BBT2001';  
 chair  
-----  
 МКИИТ  
(1 row)  
  
mtuci_db=# delete from student_group where numb='BBT2001';  
DELETE 1  
mtuci_db=# SELECT * FROM student_group;  
 id | numb | chair  
-----  
(0 rows)  
  
mtuci_db=# update student_group set numb = 'БИН2005' where chair='СИСС';  
UPDATE 0  
mtuci_db=# SELECT * FROM student_group;  
 id | numb | chair  
-----  
(0 rows)  
  
mtuci_db=# update student_group set numb = 'БИН2005';  
UPDATE 0  
mtuci_db=# SELECT * FROM student_group;  
 id | numb | chair  
-----  
(0 rows)  
  
mtuci_db=# INSERT INTO student_group(numb,chair) values('BBT2001', 'МКИИТ');  
INSERT 0 1  
mtuci_db=# SELECT * FROM student_group;  
 id | numb | chair  
-----  
  2 | BBT2001 | МКИИТ  
(1 row)  
  
mtuci_db=# update student_group set numb = 'БИН2005' where chair='МКИИТ';  
UPDATE 1  
mtuci_db=# SELECT * FROM student_group;  
 id | numb | chair  
-----  
  2 | БИН2005 | МКИИТ  
(1 row)  
mtuci_db=#
```

```
student_group(id));
CREATE TABLE
mtuci_db=# \d
List of relations
Schema | Name | Type | Owner
public | student | table | postgres
public | student_group | table | postgres
public | student_group_id_seq | sequence | postgres
public | student_id_seq | sequence | postgres
(4 rows)

mtuci_db=# \d student
Table "public.student"
Column | Type | Collation | Nullable | Default
id | integer | | not null | nextval('student_id_seq'::regclass)
full_name | character varying | | not null |
passport | character varying(10) | | not null |
group_id | integer | | not null |
Indexes:
"student_pkey" PRIMARY KEY, btree (id)
Foreign-key constraints:
"student_group_id_fkey" FOREIGN KEY (group_id) REFERENCES student_group(id)

mtuci_db=# \d student_group
Table "public.student_group"
Column | Type | Collation | Nullable | Default
id | integer | | not null | nextval('student_group_id_seq'::regclass)
numb | character varying(10) | | not null |
chair | character varying | | not null |
Indexes:
"student_group_pkey" PRIMARY KEY, btree (id)
Referenced by:
TABLE "student" CONSTRAINT "student_group_id_fkey" FOREIGN KEY (group_id) REFERENCES student_group(id)

mtuci_db=#
```

## Приступаем к выполнению домашнего задания

```
postgres=# \c WUIT_LABA_3
You are now connected to database "WUIT_LABA_3" as user "postgres".
WUIT_LABA_3=# CREATE TABLE chairs (id SERIAL PRIMARY KEY, name VARCHAR(255) NOT NULL, deanery VARCHAR(255) NOT NULL);
CREATE TABLE
WUIT_LABA_3=# \d
List of relations
Schema | Name | Type | Owner
public | chairs | table | postgres
public | chairs_id_seq | sequence | postgres
(2 rows)

WUIT_LABA_3=# \d chairs
Table "public.chairs"
Column | Type | Collation | Nullable | Default
id | integer | | not null | nextval('chairs_id_seq'::regclass)
name | character varying(255) | | not null |
deanery | character varying(255) | | not null |
Indexes:
"chairs_pkey" PRIMARY KEY, btree (id)

WUIT_LABA_3=#
```

```
WUIT_LABA_3=# CREATE TABLE student_groups (id SERIAL PRIMARY KEY, name VARCHAR(255) NOT NULL, chair VARCHAR(255) NOT NULL, chair_id INTEGER NOT NULL REFERENCES
chairs(id));
CREATE TABLE
WUIT_LABA_3=# \d
List of relations
Schema | Name | Type | Owner
public | chairs | table | postgres
public | chairs_id_seq | sequence | postgres
public | student_groups | table | postgres
public | student_groups_id_seq | sequence | postgres
(4 rows)

WUIT_LABA_3=# \d student_groups
Table "public.student_groups"
Column | Type | Collation | Nullable | Default
id | integer | | not null | nextval('student_groups_id_seq'::regclass)
name | character varying(255) | | not null |
chair | character varying(255) | | not null |
chair_id | integer | | not null |
Indexes:
"student_groups_pkey" PRIMARY KEY, btree (id)
Foreign-key constraints:
"student_groups_chair_id_fkey" FOREIGN KEY (chair_id) REFERENCES chairs(id)

WUIT_LABA_3=#
```

```

VVIT_LABA_3=# CREATE TABLE students (id SERIAL PRIMARY KEY, name VARCHAR(255) NOT NULL,passport VARCHAR(10) NOT NULL,group_name VARCHAR(255) NOT NULL, group_id INTEGER NOT NULL REFERENCES student_groups(id));
CREATE TABLE
VVIT_LABA_3=# \d

```

Schema	Name	Type	Owner
public	chairs	table	postgres
public	chairs_id_seq	sequence	postgres
public	student_groups	table	postgres
public	student_groups_id_seq	sequence	postgres
public	students	table	postgres
public	students_id_seq	sequence	postgres

(6 rows)

```

VVIT_LABA_3=# \d students

```

Column	Type	Collation	Nullable	Default
id	integer		not null	nextval('students_id_seq'::regclass)
name	character varying(255)		not null	
passport	character varying(10)		not null	
group_name	character varying(255)		not null	
group_id	integer		not null	

Indexes:

"students\_pkey" PRIMARY KEY, btree (id)

Foreign-key constraints:

"students\_group\_id\_fkey" FOREIGN KEY (group\_id) REFERENCES student\_groups(id)

```

VVIT_LABA_3=#

```

```

VVIT_LABA_3=# INSERT INTO chairs (name,deanery) VALUES ('math','Ivanov Dmitriy Fedorovich');
INSERT 0 1
VVIT_LABA_3=# INSERT INTO chairs (name,deanery) VALUES ('informatics','');
INSERT 0 1
VVIT_LABA_3=# \d chairs

```

Column	Type	Collation	Nullable	Default
id	integer		not null	nextval('chairs_id_seq'::regclass)
name	character varying(255)		not null	
deanery	character varying(255)		not null	

Indexes:

"chairs\_pkey" PRIMARY KEY, btree (id)

Referenced by:

TABLE "student\_groups" CONSTRAINT "student\_groups\_chair\_id\_fkey" FOREIGN KEY (chair\_id) REFERENCES chairs(id)

```

VVIT_LABA_3=# SELECT * FROM chairs
VVIT_LABA_3=# ^C
VVIT_LABA_3=# SELECT * FROM chairs;

```

id	name	deanery
1	math	Ivanov Dmitriy Fedorovich
2	informatics	

(2 rows)

```

VVIT_LABA_3=# UPDATE chairs SET deanery='Kyznetsov Vasilii Victorovich';
UPDATE 2
VVIT_LABA_3=# SELECT * FROM chairs;

```

id	name	deanery
1	math	Kyznetsov Vasilii Victorovich
2	informatics	Kyznetsov Vasilii Victorovich

(2 rows)

```

VVIT_LABA_3=#

```

```
Activities Terminal Feb 25 2:11 AM sypoo@sypoo-desktop: -
VVIT_LABA_3=# \d student_groups
Table "public.student_groups"
Column | Type | Collation | Nullable | Default
-----+-----+-----+-----+-----
id | integer | | not null | nextval('student_groups_id_seq'::regclass)
name | character varying(255) | | not null |
chair | character varying(255) | | not null |
chair_id | integer | | not null |
Indexes:
    "student_groups_pkey" PRIMARY KEY, btree (id)
Foreign-key constraints:
    "student_groups_chair_id_fkey" FOREIGN KEY (chair_id) REFERENCES chairs(id)
Referenced by:
    TABLE "students" CONSTRAINT "students_group_id_fkey" FOREIGN KEY (group_id) REFERENCES student_groups(id)

VVIT_LABA_3=# INSERT INTO student_groups (name,chair,chair_id) VALUES ('VMK2204','math',1);
ERROR: column "chair" specified more than once
LINE 1: INSERT INTO student_groups (name,chair,chair_id) VALUES ('VM...
               ^
VVIT_LABA_3=# INSERT INTO student_groups (name,chair,chair_id) VALUES ('VMK2204','math',1);
INSERT 0 1
VVIT_LABA_3=# INSERT INTO student_groups (name,chair,chair_id) VALUES ('KMS','math',1);
INSERT 0 1
VVIT_LABA_3=# INSERT INTO student_groups (name,chair,chair_id) VALUES ('UNM16','informatics',2);
INSERT 0 1
VVIT_LABA_3=# INSERT INTO student_groups (name,chair,chair_id) VALUES ('TMS54','informatics',2);
INSERT 0 1
VVIT_LABA_3=# SELECT * FROM student_groups;
 id | name | chair | chair_id
----+-----+-----+-----
  1 | VMK2204 | math | 1
  2 | KMS | math | 1
  3 | UNM16 | informatics | 2
  4 | TMS54 | informatics | 2
(4 rows)

VVIT_LABA_3=#
```

```
Activities Terminal Feb 25 2:21 AM sypoo@sypoo-desktop: -
VVIT_LABA_3=# \d students
Table "public.students"
Column | Type | Collation | Nullable | Default
-----+-----+-----+-----+-----
id | integer | | not null | nextval('students_id_seq'::regclass)
name | character varying(255) | | not null |
passport | character varying(10) | | not null |
group_name | character varying(255) | | not null |
group_id | integer | | not null |
Indexes:
    "students_pkey" PRIMARY KEY, btree (id)
Foreign-key constraints:
    "students_group_id_fkey" FOREIGN KEY (group_id) REFERENCES student_groups(id)

VVIT_LABA_3=# INSERT INTO students (name,passport,group_name,group_id) VALUES ('Ivan','1234567890','VMK2204',1);
INSERT 0 1
VVIT_LABA_3=# INSERT INTO students (name,passport,group_name,group_id) VALUES ('Vasiliy','1234567891','VMK2204',1);
INSERT 0 1
VVIT_LABA_3=# INSERT INTO students (name,passport,group_name,group_id) VALUES ('Dmitriy','1234567892','VMK2204',1);
INSERT 0 1
VVIT_LABA_3=# INSERT INTO students (name,passport,group_name,group_id) VALUES ('Maria','1234567893','VMK2204',1);
INSERT 0 1
VVIT_LABA_3=# INSERT INTO students (name,passport,group_name,group_id) VALUES ('Natalia','1234567894','VMK2204',1);
INSERT 0 1
VVIT_LABA_3=# INSERT INTO students (name,passport,group_name,group_id) VALUES ('Petr','3223223220','KMS',2);
INSERT 0 1
VVIT_LABA_3=# INSERT INTO students (name,passport,group_name,group_id) VALUES ('Ivan','3223223221','KMS',2);
INSERT 0 1
VVIT_LABA_3=# INSERT INTO students (name,passport,group_name,group_id) VALUES ('Alex','3223223222','KMS',2);
INSERT 0 1
VVIT_LABA_3=# INSERT INTO students (name,passport,group_name,group_id) VALUES ('Vladimir','3223223223','KMS',2);
INSERT 0 1
VVIT_LABA_3=# INSERT INTO students (name,passport,group_name,group_id) VALUES ('Maxim','3223223224','KMS',2);
INSERT 0 1
VVIT_LABA_3=# INSERT INTO students (name,passport,group_name,group_id) VALUES ('Daria','2282282280','UNM16',3);
INSERT 0 1
VVIT_LABA_3=# INSERT INTO students (name,passport,group_name,group_id) VALUES ('Rosa','2282282281','UNM16',3);
INSERT 0 1
```

```
Activities Terminal Feb 25 2:21 AM sypoo@sypoo-desktop: -
VVIT_LABA_3=# INSERT INTO students (name,passport,group_name,group_id) VALUES ('Mihail','2282282284','UNM16',3);
INSERT 0 1
VVIT_LABA_3=# INSERT INTO students (name,passport,group_name,group_id) VALUES ('Vladislav','7776667770','TMS54',4);
INSERT 0 1
VVIT_LABA_3=# INSERT INTO students (name,passport,group_name,group_id) VALUES ('Nikita','7776667771','TMS54',4);
INSERT 0 1
VVIT_LABA_3=# INSERT INTO students (name,passport,group_name,group_id) VALUES ('Dmitriy','7776667772','TMS54',4);
INSERT 0 1
VVIT_LABA_3=# INSERT INTO students (name,passport,group_name,group_id) VALUES ('Roman','7776667773','TMS54',4);
INSERT 0 1
VVIT_LABA_3=# INSERT INTO students (name,passport,group_name,group_id) VALUES ('Yan','7776667774','TMS54',4);
INSERT 0 1
VVIT_LABA_3=# SELECT * FROM students;
 id | name | passport | group_name | group_id
-----+-----+-----+-----+-----
 1 | Ivan | 1234567890 | VMK2204 | 1
 2 | Vasiliy | 1234567891 | VMK2204 | 1
 3 | Dmitriy | 1234567892 | VMK2204 | 1
 4 | Maria | 1234567893 | VMK2204 | 1
 5 | Natalia | 1234567894 | VMK2204 | 1
 6 | Petr | 3223223220 | KMS | 2
 7 | Ivan | 3223223221 | KMS | 2
 8 | Alex | 3223223222 | KMS | 2
 9 | Vladimir | 3223223223 | KMS | 2
10 | Maxim | 3223223224 | KMS | 2
11 | Daria | 2282282280 | UNM16 | 3
12 | Rosa | 2282282281 | UNM16 | 3
13 | Ivan | 2282282282 | UNM16 | 3
14 | Anastasia | 2282282283 | UNM16 | 3
15 | Mihail | 2282282284 | UNM16 | 3
16 | Vladislav | 7776667770 | TMS54 | 4
17 | Nikita | 7776667771 | TMS54 | 4
18 | Dmitriy | 7776667772 | TMS54 | 4
19 | Roman | 7776667773 | TMS54 | 4
20 | Yan | 7776667774 | TMS54 | 4
(20 rows)

VVIT_LABA_3=#
```

<https://github.com/Sypoo1/VVIT>

**Вывод:** Прodelав данную работу, я познакомился с основами SQL и научился создавать и заполнять базы данных в PostgreSQL.