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Кафедра электронных вычислительных машин

Дисциплина: Базы данных

Лабораторная работа №5
«Реализация SQL- запросов на выборку с группированием результатов»
Вариант № 3 (Автостоянка)

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СОДЕРЖАНИЕ

1 ЦЕЛЬ РАБОТЫ	3
2 ПОРЯДОК ВЫПОЛНЕНИЕ РАБОТЫ	4
3 GROUP BY, HAVING, AVG, ORDER BY	5
4 SUM, MIN, MAX, COUNT	8
5 WITH, UNION, UNION ALL, EXCEPT, INTERSECT, IN, NOT	9
6 EXISTS, ANY	15
7 ДРУГИЕ ЗАПРОСЫ	19
8 ВЫВОД	29

1 ЦЕЛЬ РАБОТЫ

В ходе лабораторной работы необходимо выполнить создание запросов на выборку данных на языке SQL с использованием подзапросов, агрегатных функций, операторов фильтрации, а также группировки данных (предложение GROUP BY оператора SELECT) и операций над множествами (UNION, INTERSECT, MINUS).

2 ПОРЯДОК ВЫПОЛНЕНИЕ РАБОТЫ

1) Для каждого задания создать реализацию в виде одного оператора SQL SELECT, в котором можно использовать подзапросы и группировку данных.

2) Перед запуском запроса на выполнение, изучить данные в используемых запросом таблицах, и, если требуется добавить новые данные, чтобы результат выборки не был пустым.

3) Выполнить запрос и проанализировать его результат – если есть расхождения между изученными данными и результатом запроса, то есть повод задуматься о проверке правильности выполнения этого задания.

3 GROUP BY, HAVING, AVG, ORDER BY

Данные таблицы Client приведены на рисунке 3.1

	Passport number [PK] character varying	Parktime double precision	Surname character varying	Name character varying	Otchestvo character varying
1	AA1024464	8.2	Romanov	Egor	Vitalievich
2	AP1026500	14.6	Dyatlov	Dmitriy	Yanovich
3	BC1000292	22.4	Kirkorov	Ivan	Petrovich
4	BC1027644	16.5	Dyatlov	Ivan	Petrovich
5	CB1015890	1.2	Dyatlov	Aleksey	Yanovich
6	CC1031322	3.1	Petrov	Ivan	Sergeevich
7	CK1004664	8.1	Sinitsin	Egor	Vitalievich
8	CP1011538	24.8	Dyatlov	Vladislav	Vladimirovich
9	EB1001842	21.4	Kirkorov	Vladislav	Yanovich
10	EB1012623	2.2	Romanov	Vladislav	Alekseevich
11	EO1004827	3.1	Kirkorov	Vasiliy	Sergeevich
12	HB1011478	15	Kirkorov	Vasiliy	Petrovich
13	HC1015350	5.9	Sinitsin	Dmitriy	Yanovich
14	HM1005447	18.3	Sinitsin	Vasiliy	Vitalievich
15	IC1014604	5.7	Kirkorov	Vasiliy	Vitalievich
16	IC1022648	8.9	Sinitsin	Dmitriy	Vladimirovich
17	IM1018716	4.2	Romanov	Aleksey	Alekseevich
18	IP1009040	5.8	Petrov	Aleksey	Vitalievich
19	KI1000491	19.3	Kirkorov	Vladislav	Alekseevich
20	KK1025667	3.4	Tkachev	Egor	Petrovich
21	KM1020037	21.6	Dyatlov	Ivan	Yanovich
22	MB1000041	14.4	Romanov	Egor	Vladimirovich
23	MI1012316	23.2	Petrov	Vasiliy	Vitalievich
24	MO1009894	20.8	Kirkorov	Vasiliy	Vitalievich
25	MP1007376	21.2	Kirkorov	Ivan	Petrovich
26	OT1023281	5.6	Sinitsin	Vasiliy	Petrovich
27	PM1028253	17	Romanov	Vladislav	Sergeevich
28	TB1009741	12.4	Dyatlov	Vladislav	Vladimirovich
29	XB1018756	21.3	Sinitsin	Ivan	Vitalievich
30	XC1024393	6.9	Dyatlov	Egor	Sergeevich

Рисунок 3.1 – Данные таблицы Client.

На рисунке 3.2 приведены данные таблицы Auto, на рисунке 3.3 приведены данные таблицы Place.

	Length smallint	Width smallint	Height smallint	Mass smallint	Auto number [PK] character varying	Client number character varying
1	6914	2073	1979	3416	1027 HO-8	CP1011538
2	4115	1707	2515	6287	1029 PM-2	MO1009894
3	4399	1503	2847	1127	1089 HC-3	CC1031322
4	5533	2173	2118	6568	1342 KB-5	IC1022648
5	4728	2340	1576	6234	2192 XX-7	EO1004827
6	6597	2251	2029	1060	2287 EK-4	XC1024393
7	3907	1543	2504	4958	2419 XE-1	MP1007376
8	5114	1843	1632	7096	2493 PO-4	OT1023281
9	5390	2323	2576	6964	2622 HH-3	IP1009040
10	6439	2225	2158	3723	2956 KA-6	KM1020037
11	5129	2131	2096	7272	3096 BO-1	IC1014604
12	4606	1871	1640	5436	3178 OX-6	BC1000292
13	5993	1928	2417	4365	3274 TA-7	KK1025667
14	4323	2320	2230	6581	3333 CM-7	PM1028253
15	3824	1950	1889	7383	4138 AO-4	CB1015890
16	5649	1738	2692	3229	5103 BO-6	TB1009741
17	5426	1668	1953	6838	5598 TX-8	EB1012623
18	4500	2002	2204	848	5664 MP-4	BC1027644
19	5079	2258	2710	4091	5971 TT-1	IM1018716
20	2054	799	1031	187	6137 PE-6	HB1011478
21	4442	1894	1889	6127	6277 TA-1	XB1018756
22	2151	778	1032	219	6362 BB-3	AP1026500
23	4667	1954	1806	6284	8178 XC-6	MI1012316
24	7963	2365	2151	3992	8305 MO-7	EB1001842
25	2112	706	1095	225	8331 MO-1	MB1000041
26	4978	2379	1533	3282	8949 EP-4	HM1005447
27	5114	1843	1632	7096	9064 KE-2	KI1000491
28	5496	2490	1847	7695	9328 MA-3	HC1015350
29	5193	1701	2072	5716	9481 AH-5	CK1004664
30	2086	722	1057	169	9516 OC-7	AA1024464

Рисунок 3.2 – Данные таблицы Auto

	Place number [PK] integer	Length smallint	Width smallint	Auto number character varying	Floor number smallint
1	1	5500	2000	2493 PO-4	1
2	2	5500	2000	9064 KE-2	1
3	3	5500	2000	2192 XX-7	1
4	4	5500	2000	3096 BO-1	1
5	5	5500	2000	3178 OX-6	1
6	6	5500	2000	5971 TT-1	1
7	7	5500	2000	8949 EP-4	1
8	8	5500	2000	1029 PM-2	1
9	9	5500	2000	1089 HC-3	1
10	10	5500	2000	9481 AH-5	1
11	11	5500	2000	3333 CM-7	1
12	12	5500	2000	5664 MP-4	1
13	13	5500	2000	8178 XC-6	1
14	14	5500	2000	4138 AO-4	1
15	15	5500	2000	9328 MA-3	1
16	16	5500	2000	5598 TX-8	1
17	17	5500	2000	6277 TA-1	1
18	18	5500	2000	2419 XE-1	1
19	19	5500	2000	2622 HH-3	1
20	20	10000	3000	1027 HO-8	1
21	21	10000	3000	8305 MO-7	1
22	22	10000	3000	2956 KA-6	1
23	23	10000	3000	5103 BO-6	1
24	24	10000	3000	3274 TA-7	1
25	25	10000	3000	1342 KB-5	1
26	26	10000	3000	2287 EK-4	1
27	27	2500	1000	8331 MO-1	1
28	28	2500	1000	6362 BB-3	1
29	29	2500	1000	6137 PE-6	1
30	30	2500	1000	9516 OC-7	1

Рисунок 3.3 – Данные таблицы Place

На рисунке 3.4 приведено получение информации о клиенте со временем парковки выше среднего.

```
1 select "Client"."Surname", "Name", "Parktime", "Auto"."Auto number"
2 from "Client" join "Auto" on "Passport number" = "Client number"
3 join "Place" on "Auto"."Auto number"="Place"."Auto number"
4 group by "Name", "Surname", "Parktime", "Auto"."Auto number" having "Parktime" > (select avg("Parktime") from "Client")
5 order by "Auto"."Auto number"
```

Data Output Messages Notifications

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	Surname character varying	Name character varying	Parktime double precision	Auto number character varying
1	Dyatlov	Vladislav	24.8	1027 HO-8
2	Kirkorov	Vasiliy	20.8	1029 PM-2
3	Kirkorov	Ivan	21.2	2419 XE-1
4	Dyatlov	Ivan	21.6	2956 KA-6
5	Kirkorov	Ivan	22.4	3178 OX-6
6	Romanov	Vladislav	17	3333 CM-7
7	Dyatlov	Ivan	16.5	5664 MP-4
8	Kirkorov	Vasiliy	15	6137 PE-6
9	Sinitsin	Ivan	21.3	6277 TA-1
10	Dyatlov	Dmitriy	14.6	6362 BB-3
11	Petrov	Vasiliy	23.2	8178 XC-6
12	Kirkorov	Vladislav	21.4	8305 MO-7
13	Romanov	Egor	14.4	8331 MO-1
14	Sinitsin	Vasiliy	18.3	8949 EP-4
15	Kirkorov	Vladislav	19.3	9064 KE-2

Рисунок 3.4 – Информация о клиенте

4 SUM, MIN, MAX, COUNT

Данные таблицы Client приведены на рисунке 4.1

	Passport number [PK] character varying	Parktime double precision	Surname character varying	Name character varying	Otchestvo character varying
1	AA1024464	8.2	Romanov	Egor	Vitalievich
2	AP1026500	14.6	Dyatlov	Dmitriy	Yanovich
3	BC1000292	22.4	Kirkorov	Ivan	Petrovich
4	BC1027644	16.5	Dyatlov	Ivan	Petrovich
5	CB1015890	1.2	Dyatlov	Aleksey	Yanovich
6	CC1031322	3.1	Petrov	Ivan	Sergeevich
7	CK1004664	8.1	Sinitsin	Egor	Vitalievich
8	CP1011538	24.8	Dyatlov	Vladislav	Vladimirovich
9	EB1001842	21.4	Kirkorov	Vladislav	Yanovich
10	EB1012623	2.2	Romanov	Vladislav	Alekseevich
11	EO1004827	3.1	Kirkorov	Vasily	Sergeevich
12	HB1011478	15	Kirkorov	Vasily	Petrovich
13	HC1015350	5.9	Sinitsin	Dmitriy	Yanovich
14	HM1005447	18.3	Sinitsin	Vasily	Vitalievich
15	IC1014604	5.7	Kirkorov	Vasily	Vitalievich
16	IC1022648	8.9	Sinitsin	Dmitriy	Vladimirovich
17	IM1018716	4.2	Romanov	Aleksey	Alekseevich
18	IP1009040	5.8	Petrov	Aleksey	Vitalievich
19	KI1000491	19.3	Kirkorov	Vladislav	Alekseevich
20	KK1025667	3.4	Tkachev	Egor	Petrovich
21	KM1020037	21.6	Dyatlov	Ivan	Yanovich
22	MB1000041	14.4	Romanov	Egor	Vladimirovich
23	MI1012316	23.2	Petrov	Vasily	Vitalievich
24	MO1009894	20.8	Kirkorov	Vasily	Vitalievich
25	MP1007376	21.2	Kirkorov	Ivan	Petrovich
26	OT1023281	5.6	Sinitsin	Vasily	Petrovich
27	PM1028253	17	Romanov	Vladislav	Sergeevich
28	TB1009741	12.4	Dyatlov	Vladislav	Vladimirovich
29	XB1018756	21.3	Sinitsin	Ivan	Vitalievich
30	XC1024393	6.9	Dyatlov	Egor	Sergeevich

Рисунок 4.1 – Данные таблицы Client.

На рисунке 4.2 приведены данные таблицы Auto, на рисунке 4.3 приведены данные таблицы Table.

	Length smallint	Width smallint	Height smallint	Mass smallint	Auto number [PK] character varying	Client number character varying
1	6914	2073	1979	3416	1027 HO-8	CP1011538
2	4115	1707	2515	6287	1029 PM-2	MO1009894
3	4399	1503	2847	1127	1089 HC-3	CC1031322
4	5533	2173	2118	6568	1342 KB-5	IC1022648
5	4728	2340	1576	6234	2192 XX-7	EO1004827
6	6597	2251	2029	1060	2287 EK-4	XC1024393
7	3907	1543	2504	4958	2419 XE-1	MP1007376
8	5114	1843	1632	7096	2493 PO-4	OT1023281
9	5390	2323	2576	6964	2622 HH-3	IP1009040
10	6439	2225	2158	3723	2956 KA-6	KM1020037
11	5129	2131	2096	7272	3096 BO-1	IC1014604
12	4606	1871	1640	5436	3178 OX-6	BC1000292
13	5993	1928	2417	4365	3274 TA-7	KK1025667
14	4323	2320	2230	6581	3333 CM-7	PM1028253
15	3824	1950	1889	7383	4138 AO-4	CB1015890
16	5649	1738	2692	3229	5103 BO-6	TB1009741
17	5426	1668	1953	6838	5598 TX-8	EB1012623
18	4500	2002	2204	848	5664 MP-4	BC1027644
19	5079	2258	2710	4091	5971 TT-1	IM1018716
20	2054	799	1031	187	6137 PE-6	HB1011478
21	4442	1894	1889	6127	6277 TA-1	XB1018756
22	2151	778	1032	219	6362 BB-3	AP1026500
23	4667	1954	1806	6284	8178 XC-6	MI1012316
24	7963	2365	2151	3992	8305 MO-7	EB1001842
25	2112	706	1095	225	8331 MO-1	MB1000041
26	4978	2379	1533	3282	8949 EP-4	HM1005447
27	5114	1843	1632	7096	9064 KE-2	KI1000491
28	5496	2490	1847	7695	9328 MA-3	HC1015350
29	5193	1701	2072	5716	9481 AH-5	CK1004664
30	2086	722	1057	169	9516 OC-7	AA1024464

Рисунок 4.2 – Данные таблицы Auto

	Table number [PK] integer	Place numbers character varying	Place type character varying	Floor number smallint
1	1	1-30	Small/Basic/Large	1
2	2	31-90	Basic	2
3	3	91-110	Basic/Large	3
4	4	111-140	Small/Basic/Large	4
5	5	141-180	Small/Basic	5
6	6	181-210	Small/Basic/Large	6
7	7	211-240	Small/Basic/Large	7
8	8	241-270	Small/Basic/Large	8
9	9	271-300	Small/Basic/Large	9
10	10	301-330	Small/Basic/Large	10
11	11	331-360	Small/Basic/Large	11
12	12	361-390	Small/Basic/Large	12
13	13	391-420	Small/Basic/Large	13
14	14	421-450	Small/Basic/Large	14
15	15	451-480	Small/Basic/Large	15
16	16	481-510	Small/Basic/Large	16
17	17	511-540	Small/Basic/Large	17
18	18	541-570	Small/Basic/Large	18
19	19	571-600	Small/Basic/Large	19
20	20	601-630	Small/Basic/Large	20
21	21	631-660	Small/Basic/Large	21
22	22	661-690	Small/Basic/Large	22
23	23	691-720	Small/Basic/Large	23
24	24	721-750	Small/Basic/Large	24
25	25	751-780	Small/Basic/Large	25
26	26	781-810	Small/Basic/Large	26
27	27	811-840	Small/Basic/Large	27
28	28	841-870	Small/Basic/Large	28
29	29	871-900	Small/Basic/Large	29
30	30	901-930	Small/Basic/Large	30

Рисунок 4.3 – Данные таблицы Table

На рисунке 4.4 приведено получение суммарной массы авто на стоянке, минимальное время парковки, максимальный номер табло и количество клиентов с фамилией Киркоров.

```

7 select sum("Mass") as "Summary auto mass", min("Parktime") as "Minimum parktime",
8 max("Table"."Table number") as "Maximum Table number",
9 (select count(*) from "Client" where "Surname" = 'Kirkorov') as "Kirkorov count"
10 from "Client"
11 join "Auto" on "Passport number" = "Auto"."Client number"
12 join "Client_Table" on "Client_Table"."Client number" = "Passport number"
13 join "Table" on "Client_Table"."Table number" = "Table"."Table number";

```

	Summary auto mass bigint	Minimum parktime double precision	Maximum Table number integer	Kirkorov count bigint
1	134468	1.2	30	8

Рисунок 4.4 – Запрашиваемые значения

5 WITH, UNION, UNION ALL, EXCEPT, INTERSECT, IN, NOT

Данные таблицы Client приведены на рисунке 5.1

	Passport number [PK] character varying	Parktime double precision	Surname character varying	Name character varying	Otchestvo character varying
1	AA1024464	8.2	Romanov	Egor	Vitalievich
2	AP1026500	14.6	Dyatlov	Dmitriy	Yanovich
3	BC1000292	22.4	Kirkorov	Ivan	Petrovich
4	BC1027644	16.5	Dyatlov	Ivan	Petrovich
5	CB1015890	1.2	Dyatlov	Aleksey	Yanovich
6	CC1031322	3.1	Petrov	Ivan	Sergeevich
7	CK1004664	8.1	Sinitsin	Egor	Vitalievich
8	CP1011538	24.8	Dyatlov	Vladislav	Vladimirovich
9	EB1001842	21.4	Kirkorov	Vladislav	Yanovich
10	EB1012623	2.2	Romanov	Vladislav	Alekseevich
11	EO1004827	3.1	Kirkorov	Vasiliy	Sergeevich
12	HB1011478	15	Kirkorov	Vasiliy	Petrovich
13	HC1015350	5.9	Sinitsin	Dmitriy	Yanovich
14	HM1005447	18.3	Sinitsin	Vasiliy	Vitalievich
15	IC1014604	5.7	Kirkorov	Vasiliy	Vitalievich
16	IC1022648	8.9	Sinitsin	Dmitriy	Vladimirovich
17	IM1018716	4.2	Romanov	Aleksey	Alekseevich
18	IP1009040	5.8	Petrov	Aleksey	Vitalievich
19	KI1000491	19.3	Kirkorov	Vladislav	Alekseevich
20	KK1025667	3.4	Tkachev	Egor	Petrovich
21	KM1020037	21.6	Dyatlov	Ivan	Yanovich
22	MB1000041	14.4	Romanov	Egor	Vladimirovich
23	MI1012316	23.2	Petrov	Vasiliy	Vitalievich
24	MO1009894	20.8	Kirkorov	Vasiliy	Vitalievich
25	MP1007376	21.2	Kirkorov	Ivan	Petrovich
26	OT1023281	5.6	Sinitsin	Vasiliy	Petrovich
27	PM1028253	17	Romanov	Vladislav	Sergeevich
28	TB1009741	12.4	Dyatlov	Vladislav	Vladimirovich
29	XB1018756	21.3	Sinitsin	Ivan	Vitalievich
30	XC1024393	6.9	Dyatlov	Egor	Sergeevich

Рисунок 5.1 – Данные таблицы Client.

На рисунке 5.2 приведены данные таблицы Auto, на рисунке 5.3 приведены данные таблицы Place.

	Length smallint	Width smallint	Height smallint	Mass smallint	Auto number [PK] character varying	Client number character varying
1	6914	2073	1979	3416	1027 HO-8	CP1011538
2	4115	1707	2515	6287	1029 PM-2	MO1009894
3	4399	1503	2847	1127	1089 HC-3	CC1031322
4	5533	2173	2118	6568	1342 KB-5	IC1022648
5	4728	2340	1576	6234	2192 XX-7	EO1004827
6	6597	2251	2029	1060	2287 EK-4	XC1024393
7	3907	1543	2504	4958	2419 XE-1	MP1007376
8	5114	1843	1632	7096	2493 PO-4	OT1023281
9	5390	2323	2576	6964	2622 HH-3	IP1009040
10	6439	2225	2158	3723	2956 KA-6	KM1020037
11	5129	2131	2096	7272	3096 BO-1	IC1014604
12	4606	1871	1640	5436	3178 OX-6	BC1000292
13	5993	1928	2417	4365	3274 TA-7	KK1025667
14	4323	2320	2230	6581	3333 CM-7	PM1028253
15	3824	1950	1889	7383	4138 AO-4	CB1015890
16	5649	1738	2692	3229	5103 BO-6	TB1009741
17	5426	1668	1953	6838	5598 TX-8	EB1012623
18	4500	2002	2204	848	5664 MP-4	BC1027644
19	5079	2258	2710	4091	5971 TT-1	IM1018716
20	2054	799	1031	187	6137 PE-6	HB1011478
21	4442	1894	1889	6127	6277 TA-1	XB1018756
22	2151	778	1032	219	6362 BB-3	AP1026500
23	4667	1954	1806	6284	8178 XC-6	MI1012316
24	7963	2365	2151	3992	8305 MO-7	EB1001842
25	2112	706	1095	225	8331 MO-1	MB1000041
26	4978	2379	1533	3282	8949 EP-4	HM1005447
27	5114	1843	1632	7096	9064 KE-2	KI1000491
28	5496	2490	1847	7695	9328 MA-3	HC1015350
29	5193	1701	2072	5716	9481 AH-5	CK1004664
30	2086	722	1057	169	9516 OC-7	AA1024464

Рисунок 5.2 – Данные таблицы Auto

	Place number [PK] integer	Length smallint	Width smallint	Auto number character varying	Floor number smallint
1	1	5500	2000	2493 PO-4	1
2	2	5500	2000	9064 KE-2	1
3	3	5500	2000	2192 XX-7	1
4	4	5500	2000	3096 BO-1	1
5	5	5500	2000	3178 OX-6	1
6	6	5500	2000	5971 TT-1	1
7	7	5500	2000	8949 EP-4	1
8	8	5500	2000	1029 PM-2	1
9	9	5500	2000	1089 HC-3	1
10	10	5500	2000	9481 AH-5	1
11	11	5500	2000	3333 CM-7	1
12	12	5500	2000	5664 MP-4	1
13	13	5500	2000	8178 XC-6	1
14	14	5500	2000	4138 AO-4	1
15	15	5500	2000	9328 MA-3	1
16	16	5500	2000	5598 TX-8	1
17	17	5500	2000	6277 TA-1	1
18	18	5500	2000	2419 XE-1	1
19	19	5500	2000	2622 HH-3	1
20	20	10000	3000	1027 HO-8	1
21	21	10000	3000	8305 MO-7	1
22	22	10000	3000	2956 KA-6	1
23	23	10000	3000	5103 BO-6	1
24	24	10000	3000	3274 TA-7	1
25	25	10000	3000	1342 KB-5	1
26	26	10000	3000	2287 EK-4	1
27	27	2500	1000	8331 MO-1	1
28	28	2500	1000	6362 BB-3	1
29	29	2500	1000	6137 PE-6	1
30	30	2500	1000	9516 OC-7	1

Рисунок 5.3 – Данные таблицы Place

На рисунке 5.4 приведено объединение паспортов и номеров машин из таблиц с последующей выборкой из них.

```
15 with ClientAuto as (
16     select "Passport number" from "Client"
17     union select "Auto"."Client number" from "Auto"
18 ), AutoPlace as (
19     select "Auto"."Auto number" from "Auto"
20     union select "Place"."Auto number" from "Place"
21 )
22 select "Surname", "Passport number", "Auto number" from "Client"
23 join "Auto" on "Passport number" = "Client number"
24 where "Passport number" in (select * from ClientAuto) and "Auto number" in (select * from AutoPlace);
```










Data Output		Messages	Notifications					
								
	Surname character varying		Passport number character varying		Auto number character varying			
1	Romanov		IM1018716		5971 TT-1			
2	Kirkorov		HB1011478		6137 PE-6			
3	Kirkorov		KI1000491		9064 KE-2			
4	Petrov		CC1031322		1089 HC-3			
5	Sinitsin		HC1015350		9328 MA-3			
6	Dyatlov		CP1011538		1027 HO-8			
7	Sinitsin		XB1018756		6277 TA-1			
8	Petrov		MI1012316		8178 XC-6			
9	Kirkorov		MO1009894		1029 PM-2			
10	Dyatlov		KM1020037		2956 KA-6			
11	Tkachev		KK1025667		3274 TA-7			
12	Romanov		PM1028253		3333 CM-7			
13	Dyatlov		CB1015890		4138 AO-4			
14	Kirkorov		MP1007376		2419 XE-1			
15	Kirkorov		EB1001842		8305 MO-7			
16	Romanov		MB1000041		8331 MO-1			
17	Sinitsin		CK1004664		9481 AH-5			
18	Dyatlov		AP1026500		6362 BB-3			
19	Sinitsin		IC1022648		1342 KB-5			
20	Dyatlov		XC1024393		2287 EK-4			
21	Sinitsin		OT1023281		2493 PO-4			
22	Kirkorov		BC1000292		3178 OX-6			
23	Kirkorov		IC1014604		3096 BO-1			
24	Dyatlov		BC1027644		5664 MP-4			
25	Kirkorov		EO1004827		2192 XX-7			
26	Petrov		IP1009040		2622 HH-3			
27	Dyatlov		TB1009741		5103 BO-6			
28	Sinitsin		HM1005447		8949 EP-4			
29	Romanov		AA1024464		9516 OC-7			
30	Romanov		EB1012623		5598 TX-8			

Рисунок 5.4 – Результаты выборки

На рисунке 5.5 приведено объединение паспортов и номеров машин из таблиц с последующей выборкой из них паспортов без определенного номера.

```

26 with ClientAuto as (
27     select "Passport number" from "Client"
28     union all select "Auto"."Client number" from "Auto"
29 ), AutoPlace as (
30     select "Auto"."Auto number" from "Auto"
31     union all select "Place"."Auto number" from "Place"
32 )
33 select "Surname", "Passport number", "Auto number" from "Client"
34 join "Auto" on "Passport number" = "Client number"
35 where "Passport number" not in (select * from ClientAuto where "Passport number" = 'AA1024464')
36 and "Auto number" in (select * from AutoPlace);

```

Data Output Messages Notifications

	Surname character varying	Passport number character varying	Auto number character varying
1	Romanov	MB1000041	8331 MO-1
2	Dyatlov	AP1026500	6362 BB-3
3	Kirkorov	HB1011478	6137 PE-6
4	Sinitsin	OT1023281	2493 PO-4
5	Kirkorov	KI1000491	9064 KE-2
6	Kirkorov	EO1004827	2192 XX-7
7	Kirkorov	IC1014604	3096 BO-1
8	Kirkorov	BC1000292	3178 OX-6
9	Romanov	IM1018716	5971 TT-1
10	Sinitsin	HM1005447	8949 EP-4
11	Dyatlov	CP1011538	1027 HO-8
12	Tkachev	KK1025667	3274 TA-7
13	Kirkorov	MO1009894	1029 PM-2
14	Petrov	CC1031322	1089 HC-3
15	Sinitsin	CK1004664	9481 AH-5
16	Romanov	PM1028253	3333 CM-7
17	Dyatlov	BC1027644	5664 MP-4
18	Dyatlov	KM1020037	2956 KA-6
19	Dyatlov	TB1009741	5103 BO-6
20	Petrov	MI1012316	8178 XC-6
21	Kirkorov	EB1001842	8305 MO-7
22	Petrov	IP1009040	2622 HH-3
23	Sinitsin	IC1022648	1342 KB-5
24	Dyatlov	CB1015890	4138 AO-4
25	Sinitsin	HC1015350	9328 MA-3
26	Dyatlov	XC1024393	2287 EK-4
27	Romanov	EB1012623	5598 TX-8
28	Sinitsin	XB1018756	6277 TA-1
29	Kirkorov	MP1007376	2419 XE-1

Рисунок 5.5 – Результаты выборки

На рисунке 5.6 приведено исключение одинаковых паспортов и вывод совпадающих номеров машин из таблиц.

```

38 with ClientAuto as (
39     select "Passport number" from "Client"
40     except select "Auto"."Client number" from "Auto"
41 ), AutoPlace as (
42     select "Auto"."Auto number" from "Auto"
43     intersect select "Place"."Auto number" from "Place"
44 )
45 select "Surname", "Passport number", "Auto number" from "Client"
46 join "Auto" on "Passport number" = "Client number"
47 where "Passport number" not in (select * from ClientAuto)
48 and "Auto number" in (select * from AutoPlace);

```

	Surname character varying	Passport number character varying	Auto number character varying
1	Romanov	MB1000041	8331 MO-1
2	Dyatlov	AP1026500	6362 BB-3
3	Kirkorov	HB1011478	6137 PE-6
4	Romanov	AA1024464	9516 OC-7
5	Sinitsin	OT1023281	2493 PO-4
6	Kirkorov	KI1000491	9064 KE-2
7	Kirkorov	EO1004827	2192 XX-7
8	Kirkorov	IC1014604	3096 BO-1
9	Kirkorov	BC1000292	3178 OX-6
10	Romanov	IM1018716	5971 TT-1
11	Sinitsin	HM1005447	8949 EP-4
12	Dyatlov	CP1011538	1027 HO-8
13	Tkachev	KK1025667	3274 TA-7
14	Kirkorov	MO1009894	1029 PM-2
15	Petrov	CC1031322	1089 HC-3
16	Sinitsin	CK1004664	9481 AH-5
17	Romanov	PM1028253	3333 CM-7
18	Dyatlov	BC1027644	5664 MP-4
19	Dyatlov	KM1020037	2956 KA-6
20	Dyatlov	TB1009741	5103 BO-6
21	Petrov	MI1012316	8178 XC-6
22	Kirkorov	EB1001842	8305 MO-7
23	Petrov	IP1009040	2622 HH-3
24	Sinitsin	IC1022648	1342 KB-5
25	Dyatlov	CB1015890	4138 AO-4
26	Sinitsin	HC1015350	9328 MA-3
27	Dyatlov	XC1024393	2287 EK-4
28	Romanov	EB1012623	5598 TX-8
29	Sinitsin	XB1018756	6277 TA-1
30	Kirkorov	MP1007376	2419 XE-1

Рисунок 5.6 – Результаты выборки

6 EXISTS, ANY

Данные таблицы Client приведены на рисунке 6.1

	Passport number [PK] character varying	Parktime double precision	Surname character varying	Name character varying	Otchestvo character varying
1	AA1024464	8.2	Romanov	Egor	Vitalievich
2	AP1026500	14.6	Dyatlov	Dmitriy	Yanovich
3	BC1000292	22.4	Kirkorov	Ivan	Petrovich
4	BC1027644	16.5	Dyatlov	Ivan	Petrovich
5	CB1015890	1.2	Dyatlov	Aleksey	Yanovich
6	CC1031322	3.1	Petrov	Ivan	Sergeevich
7	CK1004664	8.1	Sinitsin	Egor	Vitalievich
8	CP1011538	24.8	Dyatlov	Vladislav	Vladimirovich
9	EB1001842	21.4	Kirkorov	Vladislav	Yanovich
10	EB1012623	2.2	Romanov	Vladislav	Alekseevich
11	EO1004827	3.1	Kirkorov	Vasily	Sergeevich
12	HB1011478	15	Kirkorov	Vasily	Petrovich
13	HC1015350	5.9	Sinitsin	Dmitriy	Yanovich
14	HM1005447	18.3	Sinitsin	Vasily	Vitalievich
15	IC1014604	5.7	Kirkorov	Vasily	Vitalievich
16	IC1022648	8.9	Sinitsin	Dmitriy	Vladimirovich
17	IM1018716	4.2	Romanov	Aleksey	Alekseevich
18	IP1009040	5.8	Petrov	Aleksey	Vitalievich
19	KI1000491	19.3	Kirkorov	Vladislav	Alekseevich
20	KK1025667	3.4	Tkachev	Egor	Petrovich
21	KM1020037	21.6	Dyatlov	Ivan	Yanovich
22	MB1000041	14.4	Romanov	Egor	Vladimirovich
23	MI1012316	23.2	Petrov	Vasily	Vitalievich
24	MO1009894	20.8	Kirkorov	Vasily	Vitalievich
25	MP1007376	21.2	Kirkorov	Ivan	Petrovich
26	OT1023281	5.6	Sinitsin	Vasily	Petrovich
27	PM1028253	17	Romanov	Vladislav	Sergeevich
28	TB1009741	12.4	Dyatlov	Vladislav	Vladimirovich
29	XB1018756	21.3	Sinitsin	Ivan	Vitalievich
30	XC1024393	6.9	Dyatlov	Egor	Sergeevich

Рисунок 6.1 – Данные таблицы Client.

На рисунке 6.2 приведены данные таблицы Auto, на рисунке 6.3 приведены данные таблицы Place.

	Length smallint	Width smallint	Height smallint	Mass smallint	Auto number [PK] character varying	Client number character varying
1	6914	2073	1979	3416	1027 HO-8	CP1011538
2	4115	1707	2515	6287	1029 PM-2	MO1009894
3	4399	1503	2847	1127	1089 HC-3	CC1031322
4	5533	2173	2118	6568	1342 KB-5	IC1022648
5	4728	2340	1576	6234	2192 XX-7	EO1004827
6	6597	2251	2029	1060	2287 EK-4	XC1024393
7	3907	1543	2504	4958	2419 XE-1	MP1007376
8	5114	1843	1632	7096	2493 PO-4	OT1023281
9	5390	2323	2576	6964	2622 HH-3	IP1009040
10	6439	2225	2158	3723	2956 KA-6	KM1020037
11	5129	2131	2096	7272	3096 BO-1	IC1014604
12	4606	1871	1640	5436	3178 OX-6	BC1000292
13	5993	1928	2417	4365	3274 TA-7	KK1025667
14	4323	2320	2230	6581	3333 CM-7	PM1028253
15	3824	1950	1889	7383	4138 AO-4	CB1015890
16	5649	1738	2692	3229	5103 BO-6	TB1009741
17	5426	1668	1953	6838	5598 TX-8	EB1012623
18	4500	2002	2204	848	5664 MP-4	BC1027644
19	5079	2258	2710	4091	5971 TT-1	IM1018716
20	2054	799	1031	187	6137 PE-6	HB1011478
21	4442	1894	1889	6127	6277 TA-1	XB1018756
22	2151	778	1032	219	6362 BB-3	AP1026500
23	4667	1954	1806	6284	8178 XC-6	MI1012316
24	7963	2365	2151	3992	8305 MO-7	EB1001842
25	2112	706	1095	225	8331 MO-1	MB1000041
26	4978	2379	1533	3282	8949 EP-4	HM1005447
27	5114	1843	1632	7096	9064 KE-2	KI1000491
28	5496	2490	1847	7695	9328 MA-3	HC1015350
29	5193	1701	2072	5716	9481 AH-5	CK1004664
30	2086	722	1057	169	9516 OC-7	AA1024464

Рисунок 6.2 – Данные таблицы Auto

	Place number [PK] integer	Length smallint	Width smallint	Auto number character varying	Floor number smallint
1	1	5500	2000	2493 PO-4	1
2	2	5500	2000	9064 KE-2	1
3	3	5500	2000	2192 XX-7	1
4	4	5500	2000	3096 BO-1	1
5	5	5500	2000	3178 OX-6	1
6	6	5500	2000	5971 TT-1	1
7	7	5500	2000	8949 EP-4	1
8	8	5500	2000	1029 PM-2	1
9	9	5500	2000	1089 HC-3	1
10	10	5500	2000	9481 AH-5	1
11	11	5500	2000	3333 CM-7	1
12	12	5500	2000	5664 MP-4	1
13	13	5500	2000	8178 XC-6	1
14	14	5500	2000	4138 AO-4	1
15	15	5500	2000	9328 MA-3	1
16	16	5500	2000	5598 TX-8	1
17	17	5500	2000	6277 TA-1	1
18	18	5500	2000	2419 XE-1	1
19	19	5500	2000	2622 HH-3	1
20	20	10000	3000	1027 HO-8	1
21	21	10000	3000	8305 MO-7	1
22	22	10000	3000	2956 KA-6	1
23	23	10000	3000	5103 BO-6	1
24	24	10000	3000	3274 TA-7	1
25	25	10000	3000	1342 KB-5	1
26	26	10000	3000	2287 EK-4	1
27	27	2500	1000	8331 MO-1	1
28	28	2500	1000	6362 BB-3	1
29	29	2500	1000	6137 PE-6	1
30	30	2500	1000	9516 OC-7	1

Рисунок 6.3 – Данные таблицы Place

На рисунке 6.4 приведён вывод всех клиентов парковки, если среди них есть хоть один Киркоров.

```

50 select "Surname", "Name", "Parktime", "Auto"."Auto number"
51 from "Client" join "Auto" on "Passport number" = "Client number"
52 join "Place" on "Auto"."Auto number"="Place"."Auto number"
53 where exists (select * from "Client" where "Surname" = 'Kirkorov')
54 order by "Surname" asc;

```

	Surname character varying	Name character varying	Parktime double precision	Auto number character varying
1	Dyatlov	Ivan	21.6	2956 KA-6
2	Dyatlov	Vladislav	12.4	5103 BO-6
3	Dyatlov	Dmitriy	14.6	6362 BB-3
4	Dyatlov	Vladislav	24.8	1027 HO-8
5	Dyatlov	Ivan	16.5	5664 MP-4
6	Dyatlov	Egor	6.9	2287 EK-4
7	Dyatlov	Aleksey	1.2	4138 AO-4
8	Kirkorov	Ivan	21.2	2419 XE-1
9	Kirkorov	Vladislav	21.4	8305 MO-7
10	Kirkorov	Ivan	22.4	3178 OX-6
11	Kirkorov	Vladislav	19.3	9064 KE-2
12	Kirkorov	Vasiliy	15	6137 PE-6
13	Kirkorov	Vasiliy	20.8	1029 PM-2
14	Kirkorov	Vasiliy	3.1	2192 XX-7
15	Kirkorov	Vasiliy	5.7	3096 BO-1
16	Petrov	Aleksey	5.8	2622 HH-3
17	Petrov	Ivan	3.1	1089 HC-3
18	Petrov	Vasiliy	23.2	8178 XC-6
19	Romanov	Egor	8.2	9516 OC-7
20	Romanov	Aleksey	4.2	5971 TT-1
21	Romanov	Vladislav	17	3333 CM-7
22	Romanov	Vladislav	2.2	5598 TX-8
23	Romanov	Egor	14.4	8331 MO-1
24	Sinitsin	Vasiliy	5.6	2493 PO-4
25	Sinitsin	Dmitriy	8.9	1342 KB-5
26	Sinitsin	Dmitriy	5.9	9328 MA-3
27	Sinitsin	Ivan	21.3	6277 TA-1
28	Sinitsin	Egor	8.1	9481 AH-5
29	Sinitsin	Vasiliy	18.3	8949 EP-4
30	Tkachev	Egor	3.4	3274 TA-7

Рисунок 6.4 – Результаты выборки

На рисунке 6.5 приведён вывод всех клиентов парковки, у которых время парковки больше, чем у первого припарковавшегося Синицына.

56	select "Surname", "Name", "Parktime", "Auto"."Auto number"			
57	from "Client" join "Auto" on "Passport number" = "Client number"			
58	join "Place" on "Auto"."Auto number"="Place"."Auto number"			
59	where "Parktime" > any(select "Parktime" from "Client" where "Surname" = 'Sinitsin')			
60	order by "Auto"."Auto number";			

Data Output	Messages	Notifications
-------------	----------	---------------

--	--	--	--	--	--

	Surname character varying	Name character varying	Parktime double precision	Auto number character varying
1	Dyatlov	Vladislav	24.8	1027 HO-8
2	Kirkorov	Vasiliy	20.8	1029 PM-2
3	Sinitsin	Dmitriy	8.9	1342 KB-5
4	Dyatlov	Egor	6.9	2287 EK-4
5	Kirkorov	Ivan	21.2	2419 XE-1
6	Petrov	Aleksey	5.8	2622 HH-3
7	Dyatlov	Ivan	21.6	2956 KA-6
8	Kirkorov	Vasiliy	5.7	3096 BO-1
9	Kirkorov	Ivan	22.4	3178 OX-6
10	Romanov	Vladislav	17	3333 CM-7
11	Dyatlov	Vladislav	12.4	5103 BO-6
12	Dyatlov	Ivan	16.5	5664 MP-4
13	Kirkorov	Vasiliy	15	6137 PE-6
14	Sinitsin	Ivan	21.3	6277 TA-1
15	Dyatlov	Dmitriy	14.6	6362 BB-3
16	Petrov	Vasiliy	23.2	8178 XC-6
17	Kirkorov	Vladislav	21.4	8305 MO-7
18	Romanov	Egor	14.4	8331 MO-1
19	Sinitsin	Vasiliy	18.3	8949 EP-4
20	Kirkorov	Vladislav	19.3	9064 KE-2
21	Sinitsin	Dmitriy	5.9	9328 MA-3
22	Sinitsin	Egor	8.1	9481 AH-5
23	Romanov	Egor	8.2	9516 OC-7

Рисунок 6.5 – Результаты выборки

7 ДРУГИЕ ЗАПРОСЫ

Данные таблицы Client приведены на рисунке 7.1

	Passport number [PK] character varying	Parktime double precision	Surname character varying	Name character varying	Otchestvo character varying
1	AA1024464	8.2	Romanov	Egor	Vitalievich
2	AP1026500	14.6	Dyatlov	Dmitriy	Yanovich
3	BC1000292	22.4	Kirkorov	Ivan	Petrovich
4	BC1027644	16.5	Dyatlov	Ivan	Petrovich
5	CB1015890	1.2	Dyatlov	Aleksey	Yanovich
6	CC1031322	3.1	Petrov	Ivan	Sergeevich
7	CK1004664	8.1	Sinitsin	Egor	Vitalievich
8	CP1011538	24.8	Dyatlov	Vladislav	Vladimirovich
9	EB1001842	21.4	Kirkorov	Vladislav	Yanovich
10	EB1012623	2.2	Romanov	Vladislav	Alekseevich
11	EO1004827	3.1	Kirkorov	Vasily	Sergeevich
12	HB1011478	15	Kirkorov	Vasily	Petrovich
13	HC1015350	5.9	Sinitsin	Dmitriy	Yanovich
14	HM1005447	18.3	Sinitsin	Vasily	Vitalievich
15	IC1014604	5.7	Kirkorov	Vasily	Vitalievich
16	IC1022648	8.9	Sinitsin	Dmitriy	Vladimirovich
17	IM1018716	4.2	Romanov	Aleksey	Alekseevich
18	IP1009040	5.8	Petrov	Aleksey	Vitalievich
19	KI1000491	19.3	Kirkorov	Vladislav	Alekseevich
20	KK1025667	3.4	Tkachev	Egor	Petrovich
21	KM1020037	21.6	Dyatlov	Ivan	Yanovich
22	MB1000041	14.4	Romanov	Egor	Vladimirovich
23	MI1012316	23.2	Petrov	Vasily	Vitalievich
24	MO1009894	20.8	Kirkorov	Vasily	Vitalievich
25	MP1007376	21.2	Kirkorov	Ivan	Petrovich
26	OT1023281	5.6	Sinitsin	Vasily	Petrovich
27	PM1028253	17	Romanov	Vladislav	Sergeevich
28	TB1009741	12.4	Dyatlov	Vladislav	Vladimirovich
29	XB1018756	21.3	Sinitsin	Ivan	Vitalievich
30	XC1024393	6.9	Dyatlov	Egor	Sergeevich

Рисунок 7.1 – Данные таблицы Client.

На рисунке 7.2 приведены данные таблицы Auto, на рисунке 7.3 приведены данные таблицы Place.

	Length smallint	Width smallint	Height smallint	Mass smallint	Auto number [PK] character varying	Client number character varying
1	6914	2073	1979	3416	1027 HO-8	CP1011538
2	4115	1707	2515	6287	1029 PM-2	MO1009894
3	4399	1503	2847	1127	1089 HC-3	CC1031322
4	5533	2173	2118	6568	1342 KB-5	IC1022648
5	4728	2340	1576	6234	2192 XX-7	EO1004827
6	6597	2251	2029	1060	2287 EK-4	XC1024393
7	3907	1543	2504	4958	2419 XE-1	MP1007376
8	5114	1843	1632	7096	2493 PO-4	OT1023281
9	5390	2323	2576	6964	2622 HH-3	IP1009040
10	6439	2225	2158	3723	2956 KA-6	KM1020037
11	5129	2131	2096	7272	3096 BO-1	IC1014604
12	4606	1871	1640	5436	3178 OX-6	BC1000292
13	5993	1928	2417	4365	3274 TA-7	KK1025667
14	4323	2320	2230	6581	3333 CM-7	PM1028253
15	3824	1950	1889	7383	4138 AO-4	CB1015890
16	5649	1738	2692	3229	5103 BO-6	TB1009741
17	5426	1668	1953	6838	5598 TX-8	EB1012623
18	4500	2002	2204	848	5664 MP-4	BC1027644
19	5079	2258	2710	4091	5971 TT-1	IM1018716
20	2054	799	1031	187	6137 PE-6	HB1011478
21	4442	1894	1889	6127	6277 TA-1	XB1018756
22	2151	778	1032	219	6362 BB-3	AP1026500
23	4667	1954	1806	6284	8178 XC-6	MI1012316
24	7963	2365	2151	3992	8305 MO-7	EB1001842
25	2112	706	1095	225	8331 MO-1	MB1000041
26	4978	2379	1533	3282	8949 EP-4	HM1005447
27	5114	1843	1632	7096	9064 KE-2	KI1000491
28	5496	2490	1847	7695	9328 MA-3	HC1015350
29	5193	1701	2072	5716	9481 AH-5	CK1004664
30	2086	722	1057	169	9516 OC-7	AA1024464

Рисунок 7.2 – Данные таблицы Auto

	Place number [PK] integer	Length smallint	Width smallint	Auto number character varying	Floor number smallint
1	1	5500	2000	2493 PO-4	1
2	2	5500	2000	9064 KE-2	1
3	3	5500	2000	2192 XX-7	1
4	4	5500	2000	3096 BO-1	1
5	5	5500	2000	3178 OX-6	1
6	6	5500	2000	5971 TT-1	1
7	7	5500	2000	8949 EP-4	1
8	8	5500	2000	1029 PM-2	1
9	9	5500	2000	1089 HC-3	1
10	10	5500	2000	9481 AH-5	1
11	11	5500	2000	3333 CM-7	1
12	12	5500	2000	5664 MP-4	1
13	13	5500	2000	8178 XC-6	1
14	14	5500	2000	4138 AO-4	1
15	15	5500	2000	9328 MA-3	1
16	16	5500	2000	5598 TX-8	1
17	17	5500	2000	6277 TA-1	1
18	18	5500	2000	2419 XE-1	1
19	19	5500	2000	2622 HH-3	1
20	20	10000	3000	1027 HO-8	1
21	21	10000	3000	8305 MO-7	1
22	22	10000	3000	2956 KA-6	1
23	23	10000	3000	5103 BO-6	1
24	24	10000	3000	3274 TA-7	1
25	25	10000	3000	1342 KB-5	1
26	26	10000	3000	2287 EK-4	1
27	27	2500	1000	8331 MO-1	1
28	28	2500	1000	6362 BB-3	1
29	29	2500	1000	6137 PE-6	1
30	30	2500	1000	9516 OC-7	1

Рисунок 7.3 – Данные таблицы Place

На рисунке 7.4 приведён вывод всех клиентов парковки, у которых время парковки больше среднего и масса между максимальной и минимальной массой авто на парковке.

62	<code>select "Surname", "Name", "Parktime", "Auto"."Auto number", "Mass"</code>
63	<code>from "Client" join "Auto" on "Passport number" = "Client number"</code>
64	<code>join "Place" on "Auto"."Auto number"="Place"."Auto number"</code>
65	<code>group by "Surname", "Name", "Mass", "Parktime", "Auto"."Auto number"</code>
66	<code>having "Parktime" > (select avg("Parktime") from "Client")</code>
67	<code>and "Mass" between min("Mass") and max("Mass")</code>
68	<code>order by "Auto"."Auto number";</code>

Data Output Messages Notifications					
	Surname character varying	Name character varying	Parktime double precision	Auto number character varying	Mass smallint
5	Kirkorov	Ivan	22.4	3178 OX-6	5436
6	Romanov	Vladislav	17	3333 CM-7	6581
7	Dyatlov	Ivan	16.5	5664 MP-4	848
8	Kirkorov	Vasiliy	15	6137 PE-6	187
9	Sinitsin	Ivan	21.3	6277 TA-1	6127
10	Dyatlov	Dmitriy	14.6	6362 BB-3	219
11	Petrov	Vasiliy	23.2	8178 XC-6	6284
12	Kirkorov	Vladislav	21.4	8305 MO-7	3992
13	Romanov	Egor	14.4	8331 MO-1	225
14	Sinitsin	Vasiliy	18.3	8949 EP-4	3282
15	Kirkorov	Vladislav	19.3	9064 KE-2	7096

Рисунок 7.4 – Результаты выборки

На рисунке 7.5 приведён вывод всех клиентов парковки, у которых имя не Василий.

```

70 select "Client"."Surname", "Name", "Parktime", "Auto"."Auto number"
71 from "Client" join "Auto" on "Passport number" = "Client number"
72 join "Place" on "Auto"."Auto number"="Place"."Auto number" where "Name" <> 'Vasiliy'
73 order by "Name" asc;

```

Data Output Messages Notifications

	Surname character varying	Name character varying	Parktime double precision	Auto number character varying
1	Romanov	Aleksey	4.2	5971 TT-1
2	Dyatlov	Aleksey	1.2	4138 AO-4
3	Petrov	Aleksey	5.8	2622 HH-3
4	Sinitsin	Dmitriy	5.9	9328 MA-3
5	Dyatlov	Dmitriy	14.6	6362 BB-3
6	Sinitsin	Dmitriy	8.9	1342 KB-5
7	Sinitsin	Egor	8.1	9481 AH-5
8	Dyatlov	Egor	6.9	2287 EK-4
9	Romanov	Egor	8.2	9516 OC-7
10	Tkachev	Egor	3.4	3274 TA-7
11	Romanov	Egor	14.4	8331 MO-1
12	Kirkorov	Ivan	21.2	2419 XE-1
13	Kirkorov	Ivan	22.4	3178 OX-6
14	Petrov	Ivan	3.1	1089 HC-3
15	Dyatlov	Ivan	16.5	5664 MP-4
16	Sinitsin	Ivan	21.3	6277 TA-1
17	Dyatlov	Ivan	21.6	2956 KA-6
18	Dyatlov	Vladislav	12.4	5103 BO-6
19	Kirkorov	Vladislav	21.4	8305 MO-7
20	Dyatlov	Vladislav	24.8	1027 HO-8
21	Kirkorov	Vladislav	19.3	9064 KE-2
22	Romanov	Vladislav	2.2	5598 TX-8
23	Romanov	Vladislav	17	3333 CM-7

Рисунок 7.5 – Результаты выборки

	Table number [PK] integer	Place numbers character varying	Place type character varying	Floor number smallint
1	1	1-30	Small/Basic/Large	1
2	2	31-90	Basic	2
3	3	91-110	Basic/Large	3
4	4	111-140	Small/Basic/Large	4
5	5	141-180	Small/Basic	5
6	6	181-210	Small/Basic/Large	6
7	7	211-240	Small/Basic/Large	7
8	8	241-270	Small/Basic/Large	8
9	9	271-300	Small/Basic/Large	9
10	10	301-330	Small/Basic/Large	10
11	11	331-360	Small/Basic/Large	11
12	12	361-390	Small/Basic/Large	12
13	13	391-420	Small/Basic/Large	13
14	14	421-450	Small/Basic/Large	14
15	15	451-480	Small/Basic/Large	15
16	16	481-510	Small/Basic/Large	16
17	17	511-540	Small/Basic/Large	17
18	18	541-570	Small/Basic/Large	18
19	19	571-600	Small/Basic/Large	19
20	20	601-630	Small/Basic/Large	20
21	21	631-660	Small/Basic/Large	21
22	22	661-690	Small/Basic/Large	22
23	23	691-720	Small/Basic/Large	23
24	24	721-750	Small/Basic/Large	24
25	25	751-780	Small/Basic/Large	25
26	26	781-810	Small/Basic/Large	26
27	27	811-840	Small/Basic/Large	27
28	28	841-870	Small/Basic/Large	28
29	29	871-900	Small/Basic/Large	29
30	30	901-930	Small/Basic/Large	30

Рисунок 7.6 – Данные таблицы Table

На рисунке 7.7 приведён вывод номера паспорта клиентов парковки и информация об этаже, на которых припаркованы авто.

```

79 select "Passport number", "Floor"."Floor number", "Place type", "Height" from "Client"
80 join "Client_Table" on "Client number" = "Passport number"
81 join "Table" on "Table"."Table number" = "Client_Table"."Table number"
82 join "Floor" on "Table"."Floor number" = "Floor"."Floor number"

```

Data Output Messages Notifications

	Passport number character varying	Floor number integer	Place type character varying	Height double precision
1	MB1000041	1	Small/Basic/Large	3000
2	AA1024464	1	Small/Basic/Large	3000
3	AP1026500	1	Small/Basic/Large	3000
4	BC1000292	1	Small/Basic/Large	3000
5	BC1027644	1	Small/Basic/Large	3000
6	CB1015890	1	Small/Basic/Large	3000
7	CC1031322	1	Small/Basic/Large	3000
8	CK1004664	1	Small/Basic/Large	3000
9	CP1011538	1	Small/Basic/Large	3000
10	EB1001842	1	Small/Basic/Large	3000
11	EB1012623	1	Small/Basic/Large	3000
12	EO1004827	1	Small/Basic/Large	3000
13	HB1011478	1	Small/Basic/Large	3000
14	HC1015350	1	Small/Basic/Large	3000
15	HM1005447	1	Small/Basic/Large	3000
16	IC1014604	1	Small/Basic/Large	3000
17	IC1022648	1	Small/Basic/Large	3000
18	IM1018716	1	Small/Basic/Large	3000
19	IP1009040	1	Small/Basic/Large	3000
20	KI1000491	1	Small/Basic/Large	3000
21	KK1025667	1	Small/Basic/Large	3000
22	KM1020037	1	Small/Basic/Large	3000
23	MI1012316	1	Small/Basic/Large	3000
24	MO1009894	1	Small/Basic/Large	3000
25	MP1007376	1	Small/Basic/Large	3000
26	OT1023281	1	Small/Basic/Large	3000
27	PM1028253	1	Small/Basic/Large	3000
28	TB1009741	1	Small/Basic/Large	3000
29	XB1018756	1	Small/Basic/Large	3000
30	XC1024393	1	Small/Basic/Large	3000

Рисунок 7.7 – Результаты выборки

На рисунке 7.8 приведены средние масса авто и время парковки у людей с фамилией Киркоров.

84

select avg("Mass") as "Average auto mass", avg("Parktime") as "Average parktime",

85

(select count(*) from "Client" where "Surname" = 'Kirkorov') as "Kirkorov count"

86

from "Client"

87

join "Auto" on "Passport number" = "Auto"."Client number"

88

join "Client_Table" on "Client_Table"."Client number" = "Passport number";

89

Data Output

Messages

Notifications

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	Average auto mass numeric	Average parktime double precision	Kirkorov count bigint
1	4482.2666666666666667	12.55	8

Рисунок 7.8 – Результаты выборки

Данные таблицы Client приведены на рисунке 7.9

	Passport number [PK] character varying	Parktime double precision	Surname character varying	Name character varying	Otchestvo character varying
1	AA1024464	8.2	Romanov	Egor	Vitalievich
2	AP1026500	14.6	Dyatlov	Dmitriy	Yanovich
3	BC1000292	22.4	Kirkorov	Ivan	Petrovich
4	BC1027644	16.5	Dyatlov	Ivan	Petrovich
5	CB1015890	1.2	Dyatlov	Aleksey	Yanovich
6	CC1031322	3.1	Petrov	Ivan	Sergeevich
7	CK1004664	8.1	Sinitsin	Egor	Vitalievich
8	CP1011538	24.8	Dyatlov	Vladislav	Vladimirovich
9	EB1001842	21.4	Kirkorov	Vladislav	Yanovich
10	EB1012623	2.2	Romanov	Vladislav	Alekseevich
11	EO1004827	3.1	Kirkorov	Vasily	Sergeevich
12	HB1011478	15	Kirkorov	Vasily	Petrovich
13	HC1015350	5.9	Sinitsin	Dmitriy	Yanovich
14	HM1005447	18.3	Sinitsin	Vasily	Vitalievich
15	IC1014604	5.7	Kirkorov	Vasily	Vitalievich
16	IC1022648	8.9	Sinitsin	Dmitriy	Vladimirovich
17	IM1018716	4.2	Romanov	Aleksey	Alekseevich
18	IP1009040	5.8	Petrov	Aleksey	Vitalievich
19	KI1000491	19.3	Kirkorov	Vladislav	Alekseevich
20	KK1025667	3.4	Tkachev	Egor	Petrovich
21	KM1020037	21.6	Dyatlov	Ivan	Yanovich
22	MB1000041	14.4	Romanov	Egor	Vladimirovich
23	MI1012316	23.2	Petrov	Vasily	Vitalievich
24	MO1009894	20.8	Kirkorov	Vasily	Vitalievich
25	MP1007376	21.2	Kirkorov	Ivan	Petrovich
26	OT1023281	5.6	Sinitsin	Vasily	Petrovich
27	PM1028253	17	Romanov	Vladislav	Sergeevich
28	TB1009741	12.4	Dyatlov	Vladislav	Vladimirovich
29	XB1018756	21.3	Sinitsin	Ivan	Vitalievich
30	XC1024393	6.9	Dyatlov	Egor	Sergeevich

Рисунок 7.9 – Данные таблицы Client.

На рисунке 7.10 приведены данные таблицы Auto.

	Length smallint	Width smallint	Height smallint	Mass smallint	Auto number [PK] character varying	Client number character varying
1	6914	2073	1979	3416	1027 HO-8	CP1011538
2	4115	1707	2515	6287	1029 PM-2	MO1009894
3	4399	1503	2847	1127	1089 HC-3	CC1031322
4	5533	2173	2118	6568	1342 KB-5	IC1022648
5	4728	2340	1576	6234	2192 XX-7	EO1004827
6	6597	2251	2029	1060	2287 EK-4	XC1024393
7	3907	1543	2504	4958	2419 XE-1	MP1007376
8	5114	1843	1632	7096	2493 PO-4	OT1023281
9	5390	2323	2576	6964	2622 HH-3	IP1009040
10	6439	2225	2158	3723	2956 KA-6	KM1020037
11	5129	2131	2096	7272	3096 BO-1	IC1014604
12	4606	1871	1640	5436	3178 OX-6	BC1000292
13	5993	1928	2417	4365	3274 TA-7	KK1025667
14	4323	2320	2230	6581	3333 CM-7	PM1028253
15	3824	1950	1889	7383	4138 AO-4	CB1015890
16	5649	1738	2692	3229	5103 BO-6	TB1009741
17	5426	1668	1953	6838	5598 TX-8	EB1012623
18	4500	2002	2204	848	5664 MP-4	BC1027644
19	5079	2258	2710	4091	5971 TT-1	IM1018716
20	2054	799	1031	187	6137 PE-6	HB1011478
21	4442	1894	1889	6127	6277 TA-1	XB1018756
22	2151	778	1032	219	6362 BB-3	AP1026500
23	4667	1954	1806	6284	8178 XC-6	MI1012316
24	7963	2365	2151	3992	8305 MO-7	EB1001842
25	2112	706	1095	225	8331 MO-1	MB1000041
26	4978	2379	1533	3282	8949 EP-4	HM1005447
27	5114	1843	1632	7096	9064 KE-2	KI1000491
28	5496	2490	1847	7695	9328 MA-3	HC1015350
29	5193	1701	2072	5716	9481 AH-5	CK1004664
30	2086	722	1057	169	9516 OC-7	AA1024464

Рисунок 7.10 – Данные таблицы Auto

На рисунке 7.11 приведён вывод фамилии и номер паспорта клиентов, которые содержат Букву В.

```

75 select "Surname", "Passport number", "Auto number" from "Client"
76 join "Auto" on "Passport number" = "Client number"
77 where "Passport number" like '%B%' order by "Passport number";

```

	Surname character varying	Passport number character varying	Auto number character varying
1	Kirkorov	BC1000292	3178 OX-6
2	Dyatlov	BC1027644	5664 MP-4
3	Dyatlov	CB1015890	4138 AO-4
4	Kirkorov	EB1001842	8305 MO-7
5	Romanov	EB1012623	5598 TX-8
6	Kirkorov	HB1011478	6137 PE-6
7	Romanov	MB1000041	8331 MO-1
8	Dyatlov	TB1009741	5103 BO-6
9	Sinitzin	XB1018756	6277 TA-1

Рисунок 7.11 – Результаты выборки

На рисунке 7.12 приведена общая информация по парковке.

98

select * from "Client"

91

join "Client_Table" on "Client number" = "Passport number"

92

join "Table" on "Table"."Table number" = "Client_Table"."Table number"

93

join "Floor" on "Table"."Floor number" = "Floor"."Floor number";

94

Data Output

Messages

Notifications

	Passport number character varying	Parktime double precision	Surname character varying	Name character varying	Otchestvo character varying	Client number character varying	Table number smallint	Table number integer	Place numbers character varying	Place type character varying	Floor number smallint	Floor number integer	Places amount smallint	Height double precision
1	MB1000041	14.4	Romanov	Egor	Vladimirovich	MB1000041		1	1-30	Small/Basic/Large	1	1	30	3000
2	AA1024464	8.2	Romanov	Egor	Vitalievich	AA1024464		1	1-30	Small/Basic/Large	1	1	30	3000
3	AP1026500	14.6	Dyatlov	Dmitriy	Yanovich	AP1026500		1	1-30	Small/Basic/Large	1	1	30	3000
4	BC1000292	22.4	Kirkorov	Ivan	Petrovich	BC1000292		1	1-30	Small/Basic/Large	1	1	30	3000
5	BC1027644	16.5	Dyatlov	Ivan	Petrovich	BC1027644		1	1-30	Small/Basic/Large	1	1	30	3000
6	CB1015890	1.2	Dyatlov	Aleksey	Yanovich	CB1015890		1	1-30	Small/Basic/Large	1	1	30	3000
7	CC1031322	3.1	Petrov	Ivan	Sergeevich	CC1031322		1	1-30	Small/Basic/Large	1	1	30	3000
8	CK1004664	8.1	Sinitsin	Egor	Vitalievich	CK1004664		1	1-30	Small/Basic/Large	1	1	30	3000
9	CP1011538	24.8	Dyatlov	Vladislav	Vladimirovich	CP1011538		1	1-30	Small/Basic/Large	1	1	30	3000
10	EB1001842	21.4	Kirkorov	Vladislav	Yanovich	EB1001842		1	1-30	Small/Basic/Large	1	1	30	3000
11	EB1012623	2.2	Romanov	Vladislav	Alekseevich	EB1012623		1	1-30	Small/Basic/Large	1	1	30	3000
12	EO1004827	3.1	Kirkorov	Vasily	Sergeevich	EO1004827		1	1-30	Small/Basic/Large	1	1	30	3000
13	HB1011478	15	Kirkorov	Vasily	Petrovich	HB1011478		1	1-30	Small/Basic/Large	1	1	30	3000
14	HC1015350	5.9	Sinitsin	Dmitriy	Yanovich	HC1015350		1	1-30	Small/Basic/Large	1	1	30	3000
15	HM1005447	18.3	Sinitsin	Vasily	Vitalievich	HM1005447		1	1-30	Small/Basic/Large	1	1	30	3000
16	IC1014604	5.7	Kirkorov	Vasily	Vitalievich	IC1014604		1	1-30	Small/Basic/Large	1	1	30	3000
17	IC1022648	8.9	Sinitsin	Dmitriy	Vladimirovich	IC1022648		1	1-30	Small/Basic/Large	1	1	30	3000
18	IM1018716	4.2	Romanov	Aleksey	Alekseevich	IM1018716		1	1-30	Small/Basic/Large	1	1	30	3000
19	IP1009040	5.8	Petrov	Aleksey	Vitalievich	IP1009040		1	1-30	Small/Basic/Large	1	1	30	3000
20	KI1000491	19.3	Kirkorov	Vladislav	Alekseevich	KI1000491		1	1-30	Small/Basic/Large	1	1	30	3000
21	KK1025667	3.4	Tkachev	Egor	Petrovich	KK1025667		1	1-30	Small/Basic/Large	1	1	30	3000
22	KM1020037	21.6	Dyatlov	Ivan	Yanovich	KM1020037		1	1-30	Small/Basic/Large	1	1	30	3000
23	MI1012316	23.2	Petrov	Vasily	Vitalievich	MI1012316		1	1-30	Small/Basic/Large	1	1	30	3000
24	MO1009894	20.8	Kirkorov	Vasily	Vitalievich	MO1009894		1	1-30	Small/Basic/Large	1	1	30	3000
25	MP1007376	21.2	Kirkorov	Ivan	Petrovich	MP1007376		1	1-30	Small/Basic/Large	1	1	30	3000
26	OT1023281	5.6	Sinitsin	Vasily	Petrovich	OT1023281		1	1-30	Small/Basic/Large	1	1	30	3000
27	PM1028253	17	Romanov	Vladislav	Sergeevich	PM1028253		1	1-30	Small/Basic/Large	1	1	30	3000
28	TB1009741	12.4	Dyatlov	Vladimirovich	Yanovich	TB1009741		1	1-30	Small/Basic/Large	1	1	30	3000
29	XB1018756	21.3	Sinitsin	Ivan	Vitalievich	XB1018756		1	1-30	Small/Basic/Large	1	1	30	3000
30	XC1024393	6.9	Dyatlov	Egor	Sergeevich	XC1024393		1	1-30	Small/Basic/Large	1	1	30	3000

Рисунок 7.12 – Результаты выборки

На рисунке 7.13 приведён вывод фамилии, номера паспорта, номера авто, номера места, у которых номер паспорта не содержит цифры 4.

95

select "Surname", "Passport number", "Auto"."Auto number", "Place number" from "Client"

96

join "Auto" on "Passport number" = "Client number"

97

join "Place" on "Auto"."Auto number" = "Place"."Auto number"

98

where "Passport number" not in (select "Passport number" from "Client" where "Passport number" like '%4%');

Data Output

Messages

Notifications

	Surname character varying	Passport number character varying	Auto number character varying	Place number integer
1	Sinitsin	OT1023281	2493 PO-4	1
2	Kirkorov	BC1000292	3178 OX-6	5
3	Romanov	IM1018716	5971 TT-1	6
4	Petrov	CC1031322	1089 HC-3	9
5	Romanov	PM1028253	3333 CM-7	11
6	Petrov	MI1012316	8178 XC-6	13
7	Dyatlov	CB1015890	4138 AO-4	14
8	Sinitsin	HC1015350	9328 MA-3	15
9	Romanov	EB1012623	5598 TX-8	16
10	Sinitsin	XB1018756	6277 TA-1	17
11	Kirkorov	MP1007376	2419 XE-1	18
12	Dyatlov	CP1011538	1027 HO-8	20
13	Dyatlov	KM1020037	2956 KA-6	22
14	Tkachev	KK1025667	3274 TA-7	24
15	Dyatlov	AP1026500	6362 BB-3	28

Рисунок 7.13 – Результаты выборки

На рисунке 7.14 приведён вывод фамилии, номера паспорта, номера авто, номера места, у которых номер паспорта содержит число 13.

```
100 select "Surname", "Passport number", "Auto"."Auto number", "Place number" from "Client"
101 join "Auto" on "Passport number" = "Client number"
102 join "Place" on "Auto"."Auto number" = "Place"."Auto number"
103 where "Passport number" in (select "Passport number" from "Client" where "Passport number" like '%13%')
104 order by "Surname";
```

Data Output				
Messages				
Notifications				
	Surname character varying	Passport number character varying	Auto number character varying	Place number integer
1	Petrov	CC1031322	1089 HC-3	9

Рисунок 7.14 – Результаты выборки

8 ВЫВОД

В ходе лабораторной работы было выполнено создание запросов на выборку данных на языке SQL с использованием подзапросов, агрегатных функций, а также группировки данных (предложение GROUP BY оператора SELECT) и операций над множествами (UNION, INTERSECT, MINUS).