

Министерство образования Республики Беларусь

Учреждение образования  
БЕЛОРУССКИЙ ГОСУДАРСТВЕННЫЙ УНИВЕРСИТЕТ  
ИНФОРМАТИКИ И РАДИОЭЛЕКТРОНИКИ

Факультет компьютерных систем и сетей

Кафедра электронных вычислительных машин

ОТЧЕТ  
по лабораторной работе №4  
на тему

Реализация SQL-запросов на простую выборку данных  
Больница

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## **1 Цель работы**

Выполнить создание простых запросов на выборку данных на языке SQL с использованием предложений SELECT, FROM (JOINS), WHERE и ORDER BY оператора SELECT и рассмотреть использование скалярных функций.

## **2 Порядок выполнения работы**

1) Получить у преподавателя задания по вашей собственной схеме данных, созданной в лабораторной работе №2 и реализованной в виде таблиц

в СУБД в лабораторной работе №3. Создать запросы по заданиям (по одному запросу на каждое задание).

2) Правила выполнения заданий:

- для каждого задания создать реализацию в виде одного оператора выборки, в котором НЕЛЬЗЯ использовать подзапросы и группировку данных;
- при использовании соединений нескольких таблиц обратить внимание на условие задания и сделать выбор между внутренним и внешним соединениями и их вариантами реализации;
- перед запуском запроса на выполнение, изучить данные в используемых запросом таблицах, и, если требуется, добавить в вашу схему необходимые новые данные, чтобы результат выборки был контролируемым и не пустым;
- выполнить запрос и проанализировать его результат – если есть расхождения между ожидаемыми данными и результатом запроса, то есть повод задуматься о проверке правильности выполнения этого задания.

3) Оформить отчет.

## **3 Выполнение работы**

1) Вывести ФИО и номер истории болезни пациентов.

На рисунке 3.1 приведена таблица «patient» до выборки.

|    | history_number<br>[PK] integer | type_of_treatment<br>text | surname<br>text | first_name<br>text | middle_name<br>text | department_name<br>text |
|----|--------------------------------|---------------------------|-----------------|--------------------|---------------------|-------------------------|
| 1  | 1001                           | Consultation              | Smith           | John               | Alexander           | Cardiology              |
| 2  | 1002                           | Surgery                   | Johnson         | Emily              | Rose                | Orthopedics             |
| 3  | 1003                           | Check-up                  | Williams        | James              | Matthew             | Pediatrics              |
| 4  | 1004                           | Treatment                 | Brown           | Olivia             | Sophia              | Dermatology             |
| 5  | 1005                           | Consultation              | Jones           | Emma               | Grace               | Gastroenterology        |
| 6  | 1006                           | Surgery                   | Taylor          | Daniel             | Joseph              | Neurology               |
| 7  | 1007                           | Check-up                  | Wilson          | Sophia             | Elizabeth           | Gynecology              |
| 8  | 1008                           | Treatment                 | Miller          | Michael            | David               | Urology                 |
| 9  | 1009                           | Consultation              | Anderson        | Ava                | Grace               | Otolaryngology          |
| 10 | 1010                           | Surgery                   | Thomas          | Ethan              | Benjamin            | Radiology               |
| 11 | 1011                           | Check-up                  | Martinez        | Isabella           | Lily                | Endocrinology           |
| 12 | 1012                           | Treatment                 | Harris          | Mia                | Charlotte           | Rheumatology            |
| 13 | 1013                           | Consultation              | Clark           | Abigail            | Elizabeth           | Hematology              |
| 14 | 1014                           | Surgery                   | Lewis           | Elijah             | Alexander           | Nephrology              |
| 15 | 1015                           | Check-up                  | Lee             | Amelia             | Madison             | Oncology                |
| 16 | 1016                           | Treatment                 | Walker          | Liam               | Christopher         | Neonatology             |
| 17 | 1017                           | Consultation              | Green           | Harper             | Grace               | Allergy and Immunology  |
| 18 | 1018                           | Surgery                   | Gonzalez        | Evelyn             | Victoria            | Infectious Diseases     |
| 19 | 1019                           | Check-up                  | Morris          | Charlotte          | Rose                | Dentistry               |
| 21 | 1021                           | Consultation              | Smith           | Sophia             | Grace               | Cardiology              |
| 22 | 1022                           | Surgery                   | Johnson         | Liam               | James               | Orthopedics             |
| 23 | 1023                           | Check-up                  | Williams        | Ava                | Elizabeth           | Pediatrics              |
| 24 | 1024                           | Treatment                 | Brown           | Oliver             | Matthew             | Dermatology             |
| 25 | 1025                           | Consultation              | Jones           | Mia                | Grace               | Gastroenterology        |
| 26 | 1026                           | Surgery                   | Taylor          | Noah               | Joseph              | Neurology               |
| 27 | 1027                           | Check-up                  | Wilson          | Olivia             | Rose                | Gynecology              |
| 28 | 1028                           | Treatment                 | Miller          | James              | David               | Urology                 |
| 29 | 1029                           | Consultation              | Anderson        | Emma               | Grace               | Otolaryngology          |
| 30 | 1030                           | Surgery                   | Thomas          | Liam               | Benjamin            | Radiology               |

Рисунок 3.1 – таблица «patient» до выборки.

На рисунке 3.2 приведены SQL-запрос и таблица «patient» после выборки.

Query

Query History

1

2

3

4

5

SELECT

history\_number,

first\_name,

middle\_name,

surname

FROM

patient

Data Output

Messages

Notifications

history\_number

[PK] integer

first\_name

text

middle\_name

text

surname

text

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

1001

1002

1003

1004

1005

1006

1007

1008

1009

1010

1011

1012

1013

1014

1015

John

Emily

James

Olivia

Emma

Daniel

Sophia

Michael

Ava

Ethan

Isabella

Mia

Abigail

Elijah

Amelia

Alexander

Rose

Matthew

Sophia

Grace

Joseph

Elizabeth

David

Grace

Benjamin

Lily

Charlotte

Elizabeth

Alexander

Madison

Smith

Johnson

Williams

Brown

Jones

Taylor

Wilson

Miller

Anderson

Thomas

Martinez

Harris

Clark

Lewis

Lee

16

17

18

19

20

21

22

23

24

25

26

27

28

29

30

1016

1017

1018

1019

1020

1021

1022

1023

1024

1025

1026

1027

1028

1029

1030

Liam

Harper

Evelyn

Charlotte

Henry

Sophia

Liam

Ava

Oliver

Mia

Noah

Olivia

James

Emma

Liam

Christopher

Grace

Victoria

Rose

William

Grace

James

Elizabeth

Matthew

Grace

Joseph

Rose

David

Grace

Benjamin

Walker

Green

Gonzalez

Morris

Allen

Smith

Johnson

Williams

Brown

Jones

Taylor

Wilson

Miller

Anderson

Thomas

Рисунок 3.2 – SQL-запрос и таблица «patient» после выборки.

- 2) Вывести название анализа и дату его взятия.
- На рисунке 3.3 приведена таблица «test» до выборки.

|    | test_id<br>[PK] integer | name_of_nurse<br>text | test_name<br>text | date_<br>date | history_number<br>integer |
|----|-------------------------|-----------------------|-------------------|---------------|---------------------------|
| 1  | 1                       | Johnson               | Blood Test        | 2024-01-01    | 1001                      |
| 2  | 2                       | Smith                 | X-ray             | 2024-01-02    | 1002                      |
| 3  | 3                       | Williams              | Ultrasound        | 2024-01-03    | 1003                      |
| 4  | 4                       | Brown                 | MRI               | 2024-01-04    | 1004                      |
| 5  | 5                       | Jones                 | CT Scan           | 2024-01-05    | 1001                      |
| 6  | 6                       | Davis                 | Blood Test        | 2024-01-06    | 1005                      |
| 7  | 7                       | Miller                | X-ray             | 2024-01-07    | 1017                      |
| 8  | 8                       | Wilson                | Ultrasound        | 2024-01-08    | 1017                      |
| 9  | 9                       | Moore                 | MRI               | 2024-01-09    | 1018                      |
| 10 | 10                      | Taylor                | CT Scan           | 2024-01-10    | 1020                      |
| 11 | 11                      | Johnson               | Blood Test        | 2024-01-11    | 1008                      |
| 12 | 12                      | Thomas                | X-ray             | 2024-01-12    | 1009                      |
| 13 | 13                      | Johnson               | Ultrasound        | 2024-01-13    | 1002                      |
| 14 | 14                      | White                 | MRI               | 2024-01-14    | 1010                      |
| 15 | 15                      | Johnson               | CT Scan           | 2024-01-15    | 1010                      |
| 16 | 16                      | Martin                | Blood Test        | 2024-01-16    | 1011                      |
| 17 | 17                      | Johnson               | X-ray             | 2024-01-17    | 1012                      |
| 18 | 18                      | Garcia                | Ultrasound        | 2024-01-18    | 1013                      |
| 19 | 19                      | Johnson               | MRI               | 2024-01-19    | 1014                      |
| 20 | 20                      | Robinson              | CT Scan           | 2024-01-20    | 1013                      |
| 21 | 21                      | Clark                 | Blood Test        | 2024-01-21    | 1015                      |
| 22 | 22                      | Rodriguez             | X-ray             | 2024-01-22    | 1018                      |
| 23 | 23                      | Lewis                 | Ultrasound        | 2024-01-23    | 1021                      |
| 24 | 24                      | Lee                   | MRI               | 2024-01-24    | 1022                      |
| 25 | 25                      | Walker                | CT Scan           | 2024-01-25    | 1023                      |
| 26 | 26                      | Hall                  | Blood Test        | 2024-01-26    | 1024                      |
| 27 | 27                      | Johnson               | X-ray             | 2024-01-27    | 1025                      |
| 28 | 28                      | Young                 | Ultrasound        | 2024-01-28    | 1025                      |
| 29 | 29                      | Hernandez             | MRI               | 2024-01-29    | 1027                      |
| 30 | 30                      | King                  | CT Scan           | 2024-01-30    | 1026                      |

Рисунок 3.3 – таблица «test» до выборки.

На рисунке 3.4 приведены SQL-запрос и таблица «test» после выборки.

|   |                         |
|---|-------------------------|
| 1 | SELECT test_name, date_ |
| 2 | FROM test               |

  

|    | Data Output                      | Messages                     | Notification |
|----|----------------------------------|------------------------------|--------------|
|    |                                  |                              |              |
|    | test_name<br><small>text</small> | date_<br><small>date</small> |              |
| 1  | Blood Test                       | 2024-01-01                   |              |
| 2  | X-ray                            | 2024-01-02                   |              |
| 3  | Ultrasound                       | 2024-01-03                   |              |
| 4  | MRI                              | 2024-01-04                   |              |
| 5  | CT Scan                          | 2024-01-05                   |              |
| 6  | Blood Test                       | 2024-01-06                   |              |
| 7  | X-ray                            | 2024-01-07                   |              |
| 8  | Ultrasound                       | 2024-01-08                   |              |
| 9  | MRI                              | 2024-01-09                   |              |
| 10 | CT Scan                          | 2024-01-10                   |              |
| 11 | Blood Test                       | 2024-01-11                   |              |
| 12 | X-ray                            | 2024-01-12                   |              |
| 13 | Ultrasound                       | 2024-01-13                   |              |
| 14 | MRI                              | 2024-01-14                   |              |
| 15 | CT Scan                          | 2024-01-15                   |              |
| 16 | Blood Test                       | 2024-01-16                   |              |
| 17 | X-ray                            | 2024-01-17                   |              |
| 18 | Ultrasound                       | 2024-01-18                   |              |
| 19 | MRI                              | 2024-01-19                   |              |
| 20 | CT Scan                          | 2024-01-20                   |              |
| 21 | Blood Test                       | 2024-01-21                   |              |
| 22 | X-ray                            | 2024-01-22                   |              |
| 23 | Ultrasound                       | 2024-01-23                   |              |
| 24 | MRI                              | 2024-01-24                   |              |
| 25 | CT Scan                          | 2024-01-25                   |              |
| 26 | Blood Test                       | 2024-01-26                   |              |
| 27 | X-ray                            | 2024-01-27                   |              |
| 28 | Ultrasound                       | 2024-01-28                   |              |
| 29 | MRI                              | 2024-01-29                   |              |
| 30 | CT Scan                          | 2024-01-30                   |              |

Рисунок 3.4 – SQL-запрос и таблица «test» после выборки.

3) Вывести фамилии врачей с высшей квалификацией.

На рисунке 3.5 приведена таблица «doctor» до выборки.

|    | doctor_id<br>[PK] integer | surname<br>text | first_name<br>text | middle_name<br>text | speciality<br>text | qualification<br>text |
|----|---------------------------|-----------------|--------------------|---------------------|--------------------|-----------------------|
| 1  | 1                         | Smith           | John               | Michael             | Cardiology         | First                 |
| 2  | 2                         | Johnson         | Robert             | David               | Orthopedics        | Second                |
| 3  | 3                         | Williams        | James              | Thomas              | Dermatology        | Higher                |
| 4  | 4                         | Jones           | William            | Christopher         | Pediatrics         | First                 |
| 5  | 5                         | Brown           | David              | Joseph              | Ophthalmology      | Second                |
| 6  | 6                         | Davis           | Charles            | Daniel              | Gastroenterology   | Higher                |
| 7  | 7                         | Miller          | Daniel             | Matthew             | Neurology          | First                 |
| 8  | 8                         | Wilson          | Joseph             | Anthony             | Otolaryngology     | Second                |
| 9  | 9                         | Moore           | Thomas             | Andrew              | Urology            | Higher                |
| 10 | 10                        | Taylor          | Mark               | Jason               | Psychiatry         | First                 |
| 11 | 11                        | Anderson        | Michael            | Timothy             | Cardiology         | Second                |
| 12 | 12                        | Thomas          | David              | Richard             | Orthopedics        | Higher                |
| 13 | 13                        | Jackson         | Charles            | Edward              | Dermatology        | First                 |
| 14 | 14                        | White           | Robert             | William             | Pediatrics         | Second                |
| 15 | 15                        | Harris          | Matthew            | George              | Ophthalmology      | Higher                |
| 16 | 16                        | Martin          | Brian              | Scott               | Gastroenterology   | First                 |
| 17 | 17                        | Thompson        | Jason              | Alexander           | Neurology          | Second                |
| 18 | 18                        | Garcia          | Kevin              | Joseph              | Otolaryngology     | Higher                |
| 19 | 19                        | Martinez        | Edward             | Ryan                | Urology            | First                 |
| 20 | 20                        | Robinson        | William            | Benjamin            | Psychiatry         | Second                |
| 21 | 21                        | Clark           | Joshua             | Samuel              | Cardiology         | Higher                |
| 22 | 22                        | Rodriguez       | Daniel             | Stephen             | Orthopedics        | First                 |
| 23 | 23                        | Lewis           | Andrew             | Peter               | Dermatology        | Second                |
| 24 | 24                        | Lee             | Christopher        | Frank               | Pediatrics         | Higher                |
| 25 | 25                        | Walker          | Matthew            | Raymond             | Ophthalmology      | First                 |
| 26 | 26                        | Hall            | Joseph             | Patrick             | Gastroenterology   | Second                |
| 27 | 27                        | Allen           | David              | Jack                | Neurology          | Higher                |
| 28 | 28                        | Young           | Daniel             | Henry               | Otolaryngology     | First                 |
| 29 | 29                        | Hernandez       | Anthony            | Ronald              | Urology            | Second                |
| 30 | 30                        | King            | Thomas             | Edward              | Psychiatry         | Higher                |

Рисунок 3.5 – таблица «doctor» до выборки.

На рисунке 3.6 приведены SQL-запрос и таблица «doctor» после выборки.

|   |        |                             |
|---|--------|-----------------------------|
| 1 | SELECT | surname, qualification      |
| 2 | FROM   | doctor                      |
| 3 | WHERE  | qualification LIKE 'Higher' |

Data Output
Messages
Notifications

|    | surname<br>text | qualification<br>text |
|----|-----------------|-----------------------|
| 1  | Williams        | Higher                |
| 2  | Davis           | Higher                |
| 3  | Moore           | Higher                |
| 4  | Thomas          | Higher                |
| 5  | Harris          | Higher                |
| 6  | Garcia          | Higher                |
| 7  | Clark           | Higher                |
| 8  | Lee             | Higher                |
| 9  | Allen           | Higher                |
| 10 | King            | Higher                |

Рисунок 3.6 – SQL-запрос и таблица «doctor» после выборки.

4) Вывести все услуги, цена для граждан Беларуси на которые больше 70.

На рисунке 3.7 приведена таблица «service» до выборки.

|    | service_name<br>[PK] text    | price_for_belarusian<br>integer | price_for_foreigners<br>integer |
|----|------------------------------|---------------------------------|---------------------------------|
| 1  | Acupuncture Session          | 60                              | 120                             |
| 2  | Allergy Testing              | 50                              | 100                             |
| 3  | Blood Test                   | 20                              | 40                              |
| 4  | Bone Density Test            | 60                              | 120                             |
| 5  | Chiropractic Adjustment      | 100                             | 200                             |
| 6  | Colonoscopy                  | 120                             | 240                             |
| 7  | Cosmetic Procedure           | 150                             | 300                             |
| 8  | CT Scan                      | 80                              | 160                             |
| 9  | Dental Cleaning              | 40                              | 80                              |
| 10 | EKG                          | 30                              | 60                              |
| 11 | Endoscopy                    | 150                             | 300                             |
| 12 | Eye Examination              | 30                              | 60                              |
| 13 | Gastroscopy                  | 100                             | 200                             |
| 14 | Hypnosis session             | 130                             | 300                             |
| 15 | Laser Hair Removal           | 120                             | 240                             |
| 16 | Mammography                  | 70                              | 140                             |
| 17 | Massage Therapy Session      | 80                              | 160                             |
| 18 | MRI                          | 100                             | 200                             |
| 19 | Nerve Conduction Study       | 90                              | 180                             |
| 20 | Nutritional Counseling       | 50                              | 100                             |
| 21 | Occupational Therapy Session | 80                              | 160                             |
| 22 | Physical Therapy Session     | 70                              | 140                             |
| 23 | Plastic Surgery              | 200                             | 400                             |
| 24 | Psychological Counseling     | 90                              | 180                             |
| 25 | Pulmonary Function Test      | 80                              | 160                             |
| 26 | Sleep Study                  | 200                             | 400                             |
| 27 | Speech Therapy Session       | 70                              | 140                             |
| 28 | Tattoo Removal               | 100                             | 200                             |
| 29 | Ultrasound                   | 50                              | 100                             |
| 30 | X-ray                        | 40                              | 80                              |

Рисунок 3.7 – таблица «service» до выборки.

На рисунке 3.8 приведены SQL-запрос и таблица «service» после выборки.

1

SELECT \*

2

FROM service

3

WHERE price\_for\_belarusian > 70

Data Output

Messages

Notifications

|    | service_name<br>[PK] text    | price_for_belarusian<br>integer | price_for_foreigners<br>integer |
|----|------------------------------|---------------------------------|---------------------------------|
| 1  | MRI                          | 100                             | 200                             |
| 2  | CT Scan                      | 80                              | 160                             |
| 3  | Endoscopy                    | 150                             | 300                             |
| 4  | Colonoscopy                  | 120                             | 240                             |
| 5  | Pulmonary Function Test      | 80                              | 160                             |
| 6  | Nerve Conduction Study       | 90                              | 180                             |
| 7  | Sleep Study                  | 200                             | 400                             |
| 8  | Gastroscopy                  | 100                             | 200                             |
| 9  | Massage Therapy Session      | 80                              | 160                             |
| 10 | Psychological Counseling     | 90                              | 180                             |
| 11 | Chiropractic Adjustment      | 100                             | 200                             |
| 12 | Occupational Therapy Session | 80                              | 160                             |
| 13 | Cosmetic Procedure           | 150                             | 300                             |
| 14 | Laser Hair Removal           | 120                             | 240                             |
| 15 | Tattoo Removal               | 100                             | 200                             |
| 16 | Plastic Surgery              | 200                             | 400                             |
| 17 | Hypnosis session             | 130                             | 300                             |

Рисунок 3.8 – SQL-запрос и таблица «service» после выборки.

5) Вывести отделения с количеством койко-мест больше 25 и отсортировать по возрастанию.

На рисунке 3.9 приведена таблица «department» до выборки.



|    | department_name<br>[PK] text | number_of_beds<br>integer | surname_of_head<br>text | first_name_of_head<br>text | middle_name_of_head<br>text |
|----|------------------------------|---------------------------|-------------------------|----------------------------|-----------------------------|
| 1  | Allergy and Immunology       | 15                        | Allen                   | Henry                      | William                     |
| 2  | Anesthesiology               | 20                        | Cook                    | Levi                       | Benjamin                    |
| 3  | Cardiology                   | 50                        | Smith                   | John                       | Alexander                   |
| 4  | Dentistry                    | 25                        | King                    | Zoe                        | Elizabeth                   |
| 5  | Dermatology                  | 15                        | Jones                   | Emma                       | Grace                       |
| 6  | Emergency Medicine           | 15                        | Baker                   | Lily                       | Grace                       |
| 7  | Endocrinology                | 20                        | Harris                  | Mia                        | Charlotte                   |
| 8  | Gastroenterology             | 35                        | Wilson                  | Sophia                     | Elizabeth                   |
| 9  | General Surgery              | 30                        | Hill                    | Lucas                      | Matthew                     |
| 10 | Gynecology                   | 25                        | Walker                  | Liam                       | Christopher                 |
| 11 | Hematology                   | 30                        | Lewis                   | Elijah                     | Alexander                   |
| 12 | Infectious Diseases          | 20                        | Young                   | Scarlett                   | Isabella                    |
| 13 | Neonatology                  | 20                        | Morris                  | Charlotte                  | Rose                        |
| 14 | Nephrology                   | 20                        | Lee                     | Amelia                     | Madison                     |
| 15 | Neurology                    | 40                        | Taylor                  | Daniel                     | Joseph                      |
| 16 | Occupational Therapy         | 25                        | Hall                    | Grace                      | Ann                         |
| 17 | Oncology                     | 25                        | Gonzalez                | Evelyn                     | Victoria                    |
| 18 | Ophthalmology                | 20                        | Brown                   | Olivia                     | Sophia                      |
| 19 | Orthopedics                  | 25                        | Williams                | James                      | Matthew                     |
| 20 | Otolaryngology               | 20                        | Anderson                | Ava                        | Grace                       |
| 21 | Pathology                    | 15                        | Price                   | Ella                       | Sophia                      |
| 22 | Pediatrics                   | 30                        | Johnson                 | Emily                      | Rose                        |
| 23 | Physical Therapy             | 30                        | Wright                  | Carter                     | James                       |
| 24 | Plastic Surgery              | 25                        | Ward                    | Nora                       | Emily                       |
| 25 | Psychiatry                   | 30                        | Thomas                  | Ethan                      | Benjamin                    |
| 26 | Pulmonology                  | 30                        | Green                   | Harper                     | Grace                       |
| 27 | Radiology                    | 25                        | Martinez                | Isabella                   | Lily                        |
| 28 | Rheumatology                 | 15                        | Clark                   | Abigail                    | Elizabeth                   |
| 29 | Speech-language Pathology    | 20                        | Turner                  | Samuel                     | Jacob                       |
| 30 | Urology                      | 15                        | Miller                  | Michael                    | David                       |

Рисунок 3.9 – таблица «department» до выборки.

На рисунке 3.10 приведены SQL-запрос и таблица «department» после выборки.

|   |          |                     |
|---|----------|---------------------|
| 2 | FROM     | department          |
| 3 | WHERE    | number_of_beds > 25 |
| 4 | ORDER BY | number_of_beds ASC  |

Data Output
Messages
Notifications

|   | department_name<br>[PK] text | number_of_beds<br>integer | surname_of_head<br>text | first_name_of_head<br>text | middle_name_of_head<br>text |
|---|------------------------------|---------------------------|-------------------------|----------------------------|-----------------------------|
| 1 | General Surgery              | 30                        | Hill                    | Lucas                      | Matthew                     |
| 2 | Pediatrics                   | 30                        | Johnson                 | Emily                      | Rose                        |
| 3 | Hematology                   | 30                        | Lewis                   | Elijah                     | Alexander                   |
| 4 | Pulmonology                  | 30                        | Green                   | Harper                     | Grace                       |
| 5 | Physical Therapy             | 30                        | Wright                  | Carter                     | James                       |
| 6 | Psychiatry                   | 30                        | Thomas                  | Ethan                      | Benjamin                    |
| 7 | Gastroenterology             | 35                        | Wilson                  | Sophia                     | Elizabeth                   |
| 8 | Neurology                    | 40                        | Taylor                  | Daniel                     | Joseph                      |
| 9 | Cardiology                   | 50                        | Smith                   | John                       | Alexander                   |

Рисунок 3.10 – SQL-запрос и таблица «department» после выборки.

б) Вывести 10 последних выставленных диагнозов и отсортировать по убыванию.

На рисунке 3.11 приведена таблица «diagnosis» до выборки.

|    | diagnosis_id<br>[PK] integer | code<br>text | diagnosis_name<br>text  | date_<br>date | history_number<br>integer |
|----|------------------------------|--------------|-------------------------|---------------|---------------------------|
| 1  | 1                            | A001         | Common Cold             | 2023-10-05    | 1001                      |
| 2  | 2                            | B352         | Pneumonia               | 2023-08-15    | 1002                      |
| 3  | 3                            | C526         | Gastroenteritis         | 2023-09-22    | 1003                      |
| 4  | 4                            | D723         | Skin Infection          | 2023-11-10    | 1004                      |
| 5  | 5                            | E905         | Allergic Rhinitis       | 2023-07-29    | 1005                      |
| 6  | 6                            | F201         | Migraine                | 2023-12-02    | 1006                      |
| 7  | 7                            | G431         | Urinary Tract Infection | 2023-10-18    | 1007                      |
| 8  | 8                            | H821         | Otitis Media            | 2023-06-14    | 1008                      |
| 9  | 9                            | I509         | Hypertension            | 2023-09-01    | 1009                      |
| 10 | 10                           | J303         | Bronchitis              | 2023-11-26    | 1010                      |
| 11 | 11                           | A001         | Common Cold             | 2023-08-28    | 1001                      |
| 12 | 12                           | B352         | Pneumonia               | 2023-10-12    | 1012                      |
| 13 | 13                           | C526         | Gastroenteritis         | 2023-07-17    | 1003                      |
| 14 | 14                           | D723         | Skin Infection          | 2023-09-05    | 1014                      |
| 15 | 15                           | E905         | Allergic Rhinitis       | 2023-11-21    | 1005                      |
| 16 | 16                           | F201         | Migraine                | 2023-08-08    | 1016                      |
| 17 | 17                           | G431         | Urinary Tract Infection | 2023-10-25    | 1007                      |
| 18 | 18                           | H821         | Otitis Media            | 2023-12-19    | 1018                      |
| 19 | 19                           | I509         | Hypertension            | 2023-09-15    | 1009                      |
| 20 | 20                           | J303         | Bronchitis              | 2023-06-30    | 1020                      |
| 21 | 21                           | A001         | Common Cold             | 2023-11-15    | 1021                      |
| 22 | 22                           | B352         | Pneumonia               | 2023-07-04    | 1022                      |
| 23 | 23                           | C526         | Gastroenteritis         | 2023-09-09    | 1023                      |
| 24 | 24                           | D723         | Skin Infection          | 2023-12-25    | 1024                      |
| 25 | 25                           | E905         | Allergic Rhinitis       | 2023-10-02    | 1025                      |
| 26 | 26                           | F201         | Migraine                | 2023-08-20    | 1026                      |
| 27 | 27                           | G431         | Urinary Tract Infection | 2023-11-06    | 1027                      |
| 28 | 28                           | H821         | Otitis Media            | 2023-07-23    | 1028                      |
| 29 | 29                           | I509         | Hypertension            | 2023-09-29    | 1029                      |
| 30 | 30                           | J303         | Bronchitis              | 2023-06-07    | 1030                      |

Рисунок 3.11 – таблица «diagnosis» до выборки.

На рисунке 3.12 приведены SQL-запрос и таблица «diagnosis» после выборки.

|   |                              |
|---|------------------------------|
| 1 | SELECT *                     |
| 2 | FROM diagnosis               |
| 3 | ORDER BY date_ DESC LIMIT 10 |

  

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

  

|    | diagnosis_id<br>[PK] integer | code<br>text | diagnosis_name<br>text  | date_<br>date | history_number<br>integer |
|----|------------------------------|--------------|-------------------------|---------------|---------------------------|
| 1  | 24                           | D723         | Skin Infection          | 2023-12-25    | 1024                      |
| 2  | 18                           | H821         | Otitis Media            | 2023-12-19    | 1018                      |
| 3  | 6                            | F201         | Migraine                | 2023-12-02    | 1006                      |
| 4  | 10                           | J303         | Bronchitis              | 2023-11-26    | 1010                      |
| 5  | 15                           | E905         | Allergic Rhinitis       | 2023-11-21    | 1005                      |
| 6  | 21                           | A001         | Common Cold             | 2023-11-15    | 1021                      |
| 7  | 4                            | D723         | Skin Infection          | 2023-11-10    | 1004                      |
| 8  | 27                           | G431         | Urinary Tract Infection | 2023-11-06    | 1027                      |
| 9  | 17                           | G431         | Urinary Tract Infection | 2023-10-25    | 1007                      |
| 10 | 7                            | G431         | Urinary Tract Infection | 2023-10-18    | 1007                      |

Рисунок 3.12 – SQL-запрос и таблица «diagnosis» после выборки.

7) Вывести информацию о пациентах, которым проводилось МРТ с дополнительной информацией о дате исследования.

На рисунке 3.13 приведена таблица «patient» до выборки.

|    | history_number<br>[PK] integer | type_of_treatment<br>text | surname<br>text | first_name<br>text | middle_name<br>text | department_name<br>text |
|----|--------------------------------|---------------------------|-----------------|--------------------|---------------------|-------------------------|
| 1  | 1001                           | Consultation              | Smith           | John               | Alexander           | Cardiology              |
| 2  | 1002                           | Surgery                   | Johnson         | Emily              | Rose                | Orthopedics             |
| 3  | 1003                           | Check-up                  | Williams        | James              | Matthew             | Pediatrics              |
| 4  | 1004                           | Treatment                 | Brown           | Olivia             | Sophia              | Dermatology             |
| 5  | 1005                           | Consultation              | Jones           | Emma               | Grace               | Gastroenterology        |
| 6  | 1006                           | Surgery                   | Taylor          | Daniel             | Joseph              | Neurology               |
| 7  | 1007                           | Check-up                  | Wilson          | Sophia             | Elizabeth           | Gynecology              |
| 8  | 1008                           | Treatment                 | Miller          | Michael            | David               | Urology                 |
| 9  | 1009                           | Consultation              | Anderson        | Ava                | Grace               | Otolaryngology          |
| 10 | 1010                           | Surgery                   | Thomas          | Ethan              | Benjamin            | Radiology               |
| 11 | 1011                           | Check-up                  | Martinez        | Isabella           | Lily                | Endocrinology           |
| 12 | 1012                           | Treatment                 | Harris          | Mia                | Charlotte           | Rheumatology            |
| 13 | 1013                           | Consultation              | Clark           | Abigail            | Elizabeth           | Hematology              |
| 14 | 1014                           | Surgery                   | Lewis           | Elijah             | Alexander           | Nephrology              |
| 15 | 1015                           | Check-up                  | Lee             | Amelia             | Madison             | Oncology                |
| 16 | 1016                           | Treatment                 | Walker          | Liam               | Christopher         | Neonatology             |
| 17 | 1017                           | Consultation              | Green           | Harper             | Grace               | Allergy and Immunology  |
| 18 | 1018                           | Surgery                   | Gonzalez        | Evelyn             | Victoria            | Infectious Diseases     |
| 19 | 1019                           | Check-up                  | Morris          | Charlotte          | Rose                | Dentistry               |
| 21 | 1021                           | Consultation              | Smith           | Sophia             | Grace               | Cardiology              |
| 22 | 1022                           | Surgery                   | Johnson         | Liam               | James               | Orthopedics             |
| 23 | 1023                           | Check-up                  | Williams        | Ava                | Elizabeth           | Pediatrics              |
| 24 | 1024                           | Treatment                 | Brown           | Oliver             | Matthew             | Dermatology             |
| 25 | 1025                           | Consultation              | Jones           | Mia                | Grace               | Gastroenterology        |
| 26 | 1026                           | Surgery                   | Taylor          | Noah               | Joseph              | Neurology               |
| 27 | 1027                           | Check-up                  | Wilson          | Olivia             | Rose                | Gynecology              |
| 28 | 1028                           | Treatment                 | Miller          | James              | David               | Urology                 |
| 29 | 1029                           | Consultation              | Anderson        | Emma               | Grace               | Otolaryngology          |
| 30 | 1030                           | Surgery                   | Thomas          | Liam               | Benjamin            | Radiology               |

Рисунок 3.13 – таблица «patient» до выборки.

На рисунке 3.14 приведены SQL-запрос и таблица «patient» после выборки.

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```
SELECT patient.history_number,
       type_of_treatment,
       surname, first_name,
       middle_name,
       department_name,
       test_name,
       date_
FROM patient CROSS JOIN test
WHERE patient.history_number = test.history_number AND test_name LIKE 'MRI'
```

Data OutputMessagesNotifications

|   | history_number | type_of_treatment | surname  | first_name | middle_name | department_name     | test_name | date_      |
|---|----------------|-------------------|----------|------------|-------------|---------------------|-----------|------------|
|   | integer        | text              | text     | text       | text        | text                | text      | date       |
| 1 | 1004           | Treatment         | Brown    | Olivia     | Sophia      | Dermatology         | MRI       | 2024-01-04 |
| 2 | 1010           | Surgery           | Thomas   | Ethan      | Benjamin    | Radiology           | MRI       | 2024-01-14 |
| 3 | 1014           | Surgery           | Lewis    | Elijah     | Alexander   | Nephrology          | MRI       | 2024-01-19 |
| 4 | 1018           | Surgery           | Gonzalez | Evelyn     | Victoria    | Infectious Diseases | MRI       | 2024-01-09 |
| 5 | 1022           | Surgery           | Johnson  | Liam       | James       | Orthopedics         | MRI       | 2024-01-24 |
| 6 | 1027           | Check-up          | Wilson   | Olivia     | Rose        | Gynecology          | MRI       | 2024-01-29 |

Рисунок 3.14 – SQL-запрос и таблица «patient» после выборки.

8) Вывести информацию о пациентах, которым диагнозы были выставлены в октябре 2023 года с дополнительной информацией о названии диагноза

На рисунке 3.15 приведена таблица «patient» до выборки.

|    | history_number | type_of_treatment | surname  | first_name | middle_name | department_name        |
|----|----------------|-------------------|----------|------------|-------------|------------------------|
|    | [PK] integer   | text              | text     | text       | text        | text                   |
| 1  | 1001           | Consultation      | Smith    | John       | Alexander   | Cardiology             |
| 2  | 1002           | Surgery           | Johnson  | Emily      | Rose        | Orthopedics            |
| 3  | 1003           | Check-up          | Williams | James      | Matthew     | Pediatrics             |
| 4  | 1004           | Treatment         | Brown    | Olivia     | Sophia      | Dermatology            |
| 5  | 1005           | Consultation      | Jones    | Emma       | Grace       | Gastroenterology       |
| 6  | 1006           | Surgery           | Taylor   | Daniel     | Joseph      | Neurology              |
| 7  | 1007           | Check-up          | Wilson   | Sophia     | Elizabeth   | Gynecology             |
| 8  | 1008           | Treatment         | Miller   | Michael    | David       | Urology                |
| 9  | 1009           | Consultation      | Anderson | Ava        | Grace       | Otolaryngology         |
| 10 | 1010           | Surgery           | Thomas   | Ethan      | Benjamin    | Radiology              |
| 11 | 1011           | Check-up          | Martinez | Isabella   | Lily        | Endocrinology          |
| 12 | 1012           | Treatment         | Harris   | Mia        | Charlotte   | Rheumatology           |
| 13 | 1013           | Consultation      | Clark    | Abigail    | Elizabeth   | Hematology             |
| 14 | 1014           | Surgery           | Lewis    | Elijah     | Alexander   | Nephrology             |
| 15 | 1015           | Check-up          | Lee      | Amelia     | Madison     | Oncology               |
| 16 | 1016           | Treatment         | Walker   | Liam       | Christopher | Neonatology            |
| 17 | 1017           | Consultation      | Green    | Harper     | Grace       | Allergy and Immunology |
| 18 | 1018           | Surgery           | Gonzalez | Evelyn     | Victoria    | Infectious Diseases    |
| 19 | 1019           | Check-up          | Morris   | Charlotte  | Rose        | Dentistry              |
| 21 | 1021           | Consultation      | Smith    | Sophia     | Grace       | Cardiology             |
| 22 | 1022           | Surgery           | Johnson  | Liam       | James       | Orthopedics            |
| 23 | 1023           | Check-up          | Williams | Ava        | Elizabeth   | Pediatrics             |
| 24 | 1024           | Treatment         | Brown    | Oliver     | Matthew     | Dermatology            |
| 25 | 1025           | Consultation      | Jones    | Mia        | Grace       | Gastroenterology       |
| 26 | 1026           | Surgery           | Taylor   | Noah       | Joseph      | Neurology              |
| 27 | 1027           | Check-up          | Wilson   | Olivia     | Rose        | Gynecology             |
| 28 | 1028           | Treatment         | Miller   | James      | David       | Urology                |
| 29 | 1029           | Consultation      | Anderson | Emma       | Grace       | Otolaryngology         |
| 30 | 1030           | Surgery           | Thomas   | Liam       | Benjamin    | Radiology              |

Рисунок 3.15 – таблица «patient» до выборки.

На рисунке 3.16 приведены SQL-запрос и таблица «patient» после выборки.

```
1 SELECT patient.history_number,
2     type_of_treatment,
3     surname, first_name,
4     middle_name,
5     department_name,
6     diagnosis_name,
7     date_
8 FROM patient CROSS JOIN diagnosis
9 WHERE patient.history_number = diagnosis.history_number
10 AND date_ >= '2023-10-01' AND date_ <= '2023-10-31'
```

Data OutputMessagesNotifications

|   | history_number<br>integer | type_of_treatment<br>text | surname<br>text | first_name<br>text | middle_name<br>text | department_name<br>text | diagnosis_name<br>text  | date_<br>date |
|---|---------------------------|---------------------------|-----------------|--------------------|---------------------|-------------------------|-------------------------|---------------|
| 1 | 1001                      | Consultation              | Smith           | John               | Alexander           | Cardiology              | Common Cold             | 2023-10-05    |
| 2 | 1007                      | Check-up                  | Wilson          | Sophia             | Elizabeth           | Gynecology              | Urinary Tract Infection | 2023-10-25    |
| 3 | 1007                      | Check-up                  | Wilson          | Sophia             | Elizabeth           | Gynecology              | Urinary Tract Infection | 2023-10-18    |
| 4 | 1012                      | Treatment                 | Harris          | Mia                | Charlotte           | Rheumatology            | Pneumonia               | 2023-10-12    |
| 5 | 1025                      | Consultation              | Jones           | Mia                | Grace               | Gastroenterology        | Allergic Rhinitis       | 2023-10-02    |

Рисунок 3.16 – SQL-запрос и таблица «patient» после выборки.

9) Вывести фамилии врачей, которые предоставляют услугу «Удаление татуировки» их квалификацию.

На рисунке 3.17 приведена таблица «doctor» до выборки.

|    | doctor_id<br>[PK] integer | surname<br>text | first_name<br>text | middle_name<br>text | speciality<br>text | qualification<br>text |
|----|---------------------------|-----------------|--------------------|---------------------|--------------------|-----------------------|
| 1  | 1                         | Smith           | John               | Michael             | Cardiology         | First                 |
| 2  | 2                         | Johnson         | Robert             | David               | Orthopedics        | Second                |
| 3  | 3                         | Williams        | James              | Thomas              | Dermatology        | Higher                |
| 4  | 4                         | Jones           | William            | Christopher         | Pediatrics         | First                 |
| 5  | 5                         | Brown           | David              | Joseph              | Ophthalmology      | Second                |
| 6  | 6                         | Davis           | Charles            | Daniel              | Gastroenterology   | Higher                |
| 7  | 7                         | Miller          | Daniel             | Matthew             | Neurology          | First                 |
| 8  | 8                         | Wilson          | Joseph             | Anthony             | Otolaryngology     | Second                |
| 9  | 9                         | Moore           | Thomas             | Andrew              | Urology            | Higher                |
| 10 | 10                        | Taylor          | Mark               | Jason               | Psychiatry         | First                 |
| 11 | 11                        | Anderson        | Michael            | Timothy             | Cardiology         | Second                |
| 12 | 12                        | Thomas          | David              | Richard             | Orthopedics        | Higher                |
| 13 | 13                        | Jackson         | Charles            | Edward              | Dermatology        | First                 |
| 14 | 14                        | White           | Robert             | William             | Pediatrics         | Second                |
| 15 | 15                        | Harris          | Matthew            | George              | Ophthalmology      | Higher                |
| 16 | 16                        | Martin          | Brian              | Scott               | Gastroenterology   | First                 |
| 17 | 17                        | Thompson        | Jason              | Alexander           | Neurology          | Second                |
| 18 | 18                        | Garcia          | Kevin              | Joseph              | Otolaryngology     | Higher                |
| 19 | 19                        | Martinez        | Edward             | Ryan                | Urology            | First                 |
| 20 | 20                        | Robinson        | William            | Benjamin            | Psychiatry         | Second                |
| 21 | 21                        | Clark           | Joshua             | Samuel              | Cardiology         | Higher                |
| 22 | 22                        | Rodriguez       | Daniel             | Stephen             | Orthopedics        | First                 |
| 23 | 23                        | Lewis           | Andrew             | Peter               | Dermatology        | Second                |
| 24 | 24                        | Lee             | Christopher        | Frank               | Pediatrics         | Higher                |
| 25 | 25                        | Walker          | Matthew            | Raymond             | Ophthalmology      | First                 |
| 26 | 26                        | Hall            | Joseph             | Patrick             | Gastroenterology   | Second                |
| 27 | 27                        | Allen           | David              | Jack                | Neurology          | Higher                |
| 28 | 28                        | Young           | Daniel             | Henry               | Otolaryngology     | First                 |
| 29 | 29                        | Hernandez       | Anthony            | Ronald              | Urology            | Second                |
| 30 | 30                        | King            | Thomas             | Edward              | Psychiatry         | Higher                |

Рисунок 3.17 – таблица «doctor» до выборки.

На рисунке 3.18 приведены SQL-запрос и таблица «patient» после выборки.

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SELECT

doctor.doctor\_id,

surname,

qualification,

service\_name

FROM

doctor

INNER JOIN

doctor\_service

ON

doctor.doctor\_id = doctor\_service.doctor\_id

AND

service\_name

LIKE

'Tattoo Removal'

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|   | doctor_id | surname | qualification | service_name   |
|---|-----------|---------|---------------|----------------|
|   | integer   | text    | text          | text           |
| 1 | 28        | Young   | First         | Tattoo Removal |
| 2 | 30        | King    | Higher        | Tattoo Removal |

Рисунок 3.18 – SQL-запрос и таблица после выборки.

10) Вывести информацию о пациентах, которые лежат в отделениях, где меньше 25 койко-мест.

На рисунке 3.19 приведена таблица «patient» до выборки.

|    | history_number<br>[PK] integer | type_of_treatment<br>text | surname<br>text | first_name<br>text | middle_name<br>text | department_name<br>text |
|----|--------------------------------|---------------------------|-----------------|--------------------|---------------------|-------------------------|
| 1  | 1001                           | Consultation              | Smith           | John               | Alexander           | Cardiology              |
| 2  | 1002                           | Surgery                   | Johnson         | Emily              | Rose                | Orthopedics             |
| 3  | 1003                           | Check-up                  | Williams        | James              | Matthew             | Pediatrics              |
| 4  | 1004                           | Treatment                 | Brown           | Olivia             | Sophia              | Dermatology             |
| 5  | 1005                           | Consultation              | Jones           | Emma               | Grace               | Gastroenterology        |
| 6  | 1006                           | Surgery                   | Taylor          | Daniel             | Joseph              | Neurology               |
| 7  | 1007                           | Check-up                  | Wilson          | Sophia             | Elizabeth           | Gynecology              |
| 8  | 1008                           | Treatment                 | Miller          | Michael            | David               | Urology                 |
| 9  | 1009                           | Consultation              | Anderson        | Ava                | Grace               | Otolaryngology          |
| 10 | 1010                           | Surgery                   | Thomas          | Ethan              | Benjamin            | Radiology               |
| 11 | 1011                           | Check-up                  | Martinez        | Isabella           | Lily                | Endocrinology           |
| 12 | 1012                           | Treatment                 | Harris          | Mia                | Charlotte           | Rheumatology            |
| 13 | 1013                           | Consultation              | Clark           | Abigail            | Elizabeth           | Hematology              |
| 14 | 1014                           | Surgery                   | Lewis           | Elijah             | Alexander           | Nephrology              |
| 15 | 1015                           | Check-up                  | Lee             | Amelia             | Madison             | Oncology                |
| 16 | 1016                           | Treatment                 | Walker          | Liam               | Christopher         | Neonatology             |
| 17 | 1017                           | Consultation              | Green           | Harper             | Grace               | Allergy and Immunology  |
| 18 | 1018                           | Surgery                   | Gonzalez        | Evelyn             | Victoria            | Infectious Diseases     |
| 19 | 1019                           | Check-up                  | Morris          | Charlotte          | Rose                | Dentistry               |
| 21 | 1021                           | Consultation              | Smith           | Sophia             | Grace               | Cardiology              |
| 22 | 1022                           | Surgery                   | Johnson         | Liam               | James               | Orthopedics             |
| 23 | 1023                           | Check-up                  | Williams        | Ava                | Elizabeth           | Pediatrics              |
| 24 | 1024                           | Treatment                 | Brown           | Oliver             | Matthew             | Dermatology             |
| 25 | 1025                           | Consultation              | Jones           | Mia                | Grace               | Gastroenterology        |
| 26 | 1026                           | Surgery                   | Taylor          | Noah               | Joseph              | Neurology               |
| 27 | 1027                           | Check-up                  | Wilson          | Olivia             | Rose                | Gynecology              |
| 28 | 1028                           | Treatment                 | Miller          | James              | David               | Urology                 |
| 29 | 1029                           | Consultation              | Anderson        | Emma               | Grace               | Otolaryngology          |
| 30 | 1030                           | Surgery                   | Thomas          | Liam               | Benjamin            | Radiology               |

Рисунок 3.19 – таблица «patient» до выборки.



На рисунке 3.20 приведены SQL-запрос и таблица после выборки.

```

1 SELECT history_number,
2        surname,
3        type_of_treatment,
4        patient.department_name,
5        number_of_beds
6 FROM patient INNER JOIN department
7 ON patient.department_name = department.department_name
8 WHERE number_of_beds < 25

```

|    | history_number<br>integer | surname<br>text | type_of_treatment<br>text | department_name<br>text | number_of_beds<br>integer |
|----|---------------------------|-----------------|---------------------------|-------------------------|---------------------------|
| 1  | 1004                      | Brown           | Treatment                 | Dermatology             | 15                        |
| 2  | 1008                      | Miller          | Treatment                 | Urology                 | 15                        |
| 3  | 1009                      | Anderson        | Consultation              | Otolaryngology          | 20                        |
| 4  | 1011                      | Martinez        | Check-up                  | Endocrinology           | 20                        |
| 5  | 1012                      | Harris          | Treatment                 | Rheumatology            | 15                        |
| 6  | 1014                      | Lewis           | Surgery                   | Nephrology              | 20                        |
| 7  | 1016                      | Walker          | Treatment                 | Neonatology             | 20                        |
| 8  | 1017                      | Green           | Consultation              | Allergy and Immunology  | 15                        |
| 9  | 1018                      | Gonzalez        | Surgery                   | Infectious Diseases     | 20                        |
| 10 | 1024                      | Brown           | Treatment                 | Dermatology             | 15                        |
| 11 | 1028                      | Miller          | Treatment                 | Urology                 | 15                        |
| 12 | 1029                      | Anderson        | Consultation              | Otolaryngology          | 20                        |

Рисунок 3.20 – SQL-запрос и таблица после выборки.

11) Вывести информацию о пациентах, которым предоставлена консультация и поставленный диагноз с помощью оператора LEFT OUTER JOIN.

Таблицы «patient» и «diagnosis» представлены на рисунках 3.19 и 3.11. На рисунке 3.21 приведены SQL-запрос и таблица после выборки.

```

1 SELECT patient.history_number,
2        surname,
3        type_of_treatment,
4        department_name,
5        diagnosis_name
6 FROM patient LEFT OUTER JOIN diagnosis
7 ON patient.history_number = diagnosis.history_number
8 WHERE type_of_treatment LIKE 'Consultation'

```

|    | history_number<br>integer | surname<br>text | type_of_treatment<br>text | department_name<br>text | diagnosis_name<br>text |
|----|---------------------------|-----------------|---------------------------|-------------------------|------------------------|
| 1  | 1001                      | Smith           | Consultation              | Cardiology              | Common Cold            |
| 2  | 1005                      | Jones           | Consultation              | Gastroenterology        | Allergic Rhinitis      |
| 3  | 1009                      | Anderson        | Consultation              | Otolaryngology          | Hypertension           |
| 4  | 1001                      | Smith           | Consultation              | Cardiology              | Common Cold            |
| 5  | 1005                      | Jones           | Consultation              | Gastroenterology        | Allergic Rhinitis      |
| 6  | 1009                      | Anderson        | Consultation              | Otolaryngology          | Hypertension           |
| 7  | 1021                      | Smith           | Consultation              | Cardiology              | Common Cold            |
| 8  | 1025                      | Jones           | Consultation              | Gastroenterology        | Allergic Rhinitis      |
| 9  | 1029                      | Anderson        | Consultation              | Otolaryngology          | Hypertension           |
| 10 | 1017                      | Green           | Consultation              | Allergy and Immunology  | [null]                 |
| 11 | 1013                      | Clark           | Consultation              | Hematology              | [null]                 |

Рисунок 3.21 – SQL-запрос и таблица после выборки.

12) Вывести информацию о врачах и платных услугах, которые эти врачи предоставляют с помощью оператора LEFT OUTER JOIN.

Таблица «doctor» представлена на рисунке 3.17.

Таблица «doctor\_service» представлена на рисунке 3.22.

|    | service_name<br>[PK] text    | doctor_id<br>[PK] integer |
|----|------------------------------|---------------------------|
| 1  | Acupuncture Session          | 19                        |
| 2  | Allergy Testing              | 11                        |
| 3  | Blood Test                   | 5                         |
| 4  | Bone Density Test            | 10                        |
| 5  | Chiropractic Adjustment      | 23                        |
| 6  | Colonoscopy                  | 8                         |
| 7  | Cosmetic Procedure           | 26                        |
| 8  | CT Scan                      | 2                         |
| 9  | Dental Cleaning              | 16                        |
| 10 | EKG                          | 6                         |
| 11 | Endoscopy                    | 8                         |
| 12 | Eye Examination              | 17                        |
| 13 | Gastroscopy                  | 8                         |
| 14 | Laser Hair Removal           | 30                        |
| 15 | Mammography                  | 9                         |
| 16 | Massage Therapy Session      | 18                        |
| 17 | MRI                          | 1                         |
| 18 | Nerve Conduction Study       | 22                        |
| 19 | Nutritional Counseling       | 21                        |
| 20 | Occupational Therapy Session | 24                        |
| 21 | Physical Therapy Session     | 18                        |
| 22 | Plastic Surgery              | 29                        |
| 23 | Psychological Counseling     | 22                        |
| 24 | Pulmonary Function Test      | 12                        |
| 25 | Sleep Study                  | 25                        |
| 26 | Speech Therapy Session       | 25                        |
| 27 | Tattoo Removal               | 28                        |
| 28 | Tattoo Removal               | 30                        |
| 29 | Ultrasound                   | 3                         |
| 30 | X-ray                        | 4                         |

Рисунок 3.22 – таблица «doctor\_service» до выборки.

На рисунке 3.23 приведены SQL-запрос и таблица после выборки.



Data Output Messages Notifications

Рисунок 3.23 – SQL-запрос и таблица после выборки.

13) Вывести информацию о пациентах, которым предоставлена консультация и поставленный диагноз с помощью оператора RIGHT OUTER JOIN.

Таблицы «patient» и «diagnosis» представлены на рисунках 3.19 и 3.11. На рисунке 3.24 приведены SQL-запрос и таблица после выборки.

Data Output

Messages

Notifications

+

Рисунок 3.24 – SQL-запрос и таблица после выборки.

14) Вывести информацию о врачах с высшей квалификацией и платных услугах, которые эти врачи предоставляют с помощью оператора RIGHT OUTER JOIN.

Таблица «doctor» представлена на рисунке 3.17.

Таблица «doctor\_service» представлена на рисунке 3.22.

На рисунке 3.25 приведены SQL-запрос и таблица после выборки.

```

1 SELECT *
2 FROM doctor_service RIGHT OUTER JOIN doctor
3 ON doctor_service.doctor_id = doctor.doctor_id
4 WHERE qualification LIKE 'Higher'

```

Data Output

Messages

Notifications

|    | service_name<br>text         | doctor_id<br>integer | doctor_id<br>integer | surname<br>text | first_name<br>text | middle_name<br>text | speciality<br>text | qualification<br>text |
|----|------------------------------|----------------------|----------------------|-----------------|--------------------|---------------------|--------------------|-----------------------|
| 1  | Ultrasound                   | 3                    | 3                    | Williams        | James              | Thomas              | Dermatology        | Higher                |
| 2  | EKG                          | 6                    | 6                    | Davis           | Charles            | Daniel              | Gastroenterology   | Higher                |
| 3  | Mammography                  | 9                    | 9                    | Moore           | Thomas             | Andrew              | Urology            | Higher                |
| 4  | Pulmonary Function Test      | 12                   | 12                   | Thomas          | David              | Richard             | Orthopedics        | Higher                |
| 5  | Physical Therapy Session     | 18                   | 18                   | Garcia          | Kevin              | Joseph              | Otolaryngology     | Higher                |
| 6  | Nutritional Counseling       | 21                   | 21                   | Clark           | Joshua             | Samuel              | Cardiology         | Higher                |
| 7  | Occupational Therapy Session | 24                   | 24                   | Lee             | Christopher        | Frank               | Pediatrics         | Higher                |
| 8  | Tattoo Removal               | 30                   | 30                   | King            | Thomas             | Edward              | Psychiatry         | Higher                |
| 9  | Laser Hair Removal           | 30                   | 30                   | King            | Thomas             | Edward              | Psychiatry         | Higher                |
| 10 | Massage Therapy Session      | 18                   | 18                   | Garcia          | Kevin              | Joseph              | Otolaryngology     | Higher                |
| 11 | [null]                       | [null]               | 27                   | Allen           | David              | Jack                | Neurology          | Higher                |
| 12 | [null]                       | [null]               | 15                   | Harris          | Matthew            | George              | Ophthalmology      | Higher                |

Рисунок 3.25 – SQL-запрос и таблица после выборки.

- 15) Вывести список пациентов с дополнительной информацией об осмотре пациента врачом в период с 01.01.2023 до 15.01.2023.
- На рисунке 3.19 приведена таблица «patient» до выборки.
- На рисунке 3.26 приведена таблица «doctor-patient» до выборки.

|    | history_number<br>[PK] integer | doctor_id<br>[PK] integer | date_<br>[PK] date | note<br>text                                    |
|----|--------------------------------|---------------------------|--------------------|---|
| 1  | 1001                           | 1                         | 2023-01-01         | Patient had a routine check-up.                 |
| 2  | 1002                           | 2                         | 2023-01-02         | Patient reported symptoms of cough and fever.   |
| 3  | 1003                           | 3                         | 2023-01-03         | Patient came in for a follow-up appointment.    |
| 4  | 1004                           | 4                         | 2023-01-04         | Patient received X-ray examination.             |
| 5  | 1005                           | 5                         | 2023-01-05         | Patient underwent blood test.                   |
| 6  | 1006                           | 6                         | 2023-01-06         | Patient had an EKG performed.                   |
| 7  | 1007                           | 7                         | 2023-01-07         | Patient underwent endoscopy procedure.          |
| 8  | 1008                           | 8                         | 2023-01-08         | Patient received colonoscopy.                   |
| 9  | 1009                           | 9                         | 2023-01-09         | Patient had a mammography.                      |
| 10 | 1010                           | 10                        | 2023-01-10         | Patient received bone density test.             |
| 11 | 1011                           | 11                        | 2023-01-11         | Patient came in for allergy testing.            |
| 12 | 1012                           | 12                        | 2023-01-12         | Patient underwent pulmonary function test.      |
| 13 | 1013                           | 13                        | 2023-01-13         | Patient had a nerve conduction study.           |
| 14 | 1014                           | 14                        | 2023-01-14         | Patient underwent sleep study.                  |
| 15 | 1015                           | 15                        | 2023-01-15         | Patient received gastroscopy.                   |
| 16 | 1016                           | 16                        | 2023-01-16         | Patient had a dental cleaning.                  |
| 17 | 1017                           | 17                        | 2023-01-17         | Patient came in for an eye examination.         |
| 18 | 1018                           | 18                        | 2023-01-18         | Patient received a physical therapy session.    |
| 19 | 1019                           | 19                        | 2023-01-19         | Patient underwent an acupuncture session.       |
| 20 | 1020                           | 20                        | 2023-01-20         | Patient had a massage therapy session.          |
| 21 | 1021                           | 21                        | 2023-01-21         | Patient received nutritional counseling.        |
| 22 | 1022                           | 22                        | 2023-01-22         | Patient had a psychological counseling session. |
| 23 | 1023                           | 23                        | 2023-01-23         | Patient received a chiropractic adjustment.     |
| 24 | 1024                           | 24                        | 2023-01-24         | Patient had an occupational therapy session.    |
| 25 | 1025                           | 25                        | 2023-01-25         | Patient underwent a speech therapy session.     |
| 26 | 1026                           | 26                        | 2023-01-26         | Patient received a cosmetic procedure.          |
| 27 | 1027                           | 27                        | 2023-01-27         | Patient had laser hair removal.                 |
| 28 | 1028                           | 28                        | 2023-01-28         | Patient came in for tattoo removal.             |
| 29 | 1029                           | 29                        | 2023-01-29         | Patient underwent plastic surgery.              |
| 30 | 1030                           | 30                        | 2023-01-30         | Patient had a dermatology consultation.         |

Рисунок 3.26 – таблица «doctor\_patient» до выборки.

На рисунке 3.27 приведены SQL-запрос и таблица после выборки.

1

SELECT \*

2

FROM patient FULL OUTER JOIN doctor\_patient

3

ON patient.history\_number = doctor\_patient.history\_number

4

WHERE date\_>='2023-01-01' AND date\_<='2023-01-15'

Data Output

Messages

Notifications

|    | history_number<br>integer | type_of_treatment<br>text | surname<br>text | first_name<br>text | middle_name<br>text | department_name<br>text | history_number<br>integer | doctor_id<br>integer | date_<br>date | note<br>text                                  |
|----|---------------------------|---------------------------|-----------------|--------------------|---------------------|-------------------------|---------------------------|----------------------|---------------|---|
| 1  | 1001                      | Consultation              | Smith           | John               | Alexander           | Cardiology              | 1001                      | 1                    | 2023-01-01    | Patient had a routine check-up.               |
| 2  | 1002                      | Surgery                   | Johnson         | Emily              | Rose                | Orthopedics             | 1002                      | 2                    | 2023-01-02    | Patient reported symptoms of cough and fever. |
| 3  | 1003                      | Check-up                  | Williams        | James              | Matthew             | Pediatrics              | 1003                      | 3                    | 2023-01-03    | Patient came in for a follow-up appointment.  |
| 4  | 1004                      | Treatment                 | Brown           | Olivia             | Sophia              | Dermatology             | 1004                      | 4                    | 2023-01-04    | Patient received X-ray examination.           |
| 5  | 1005                      | Consultation              | Jones           | Emma               | Grace               | Gastroenterology        | 1005                      | 5                    | 2023-01-05    | Patient underwent blood test.                 |
| 6  | 1006                      | Surgery                   | Taylor          | Daniel             | Joseph              | Neurology               | 1006                      | 6                    | 2023-01-06    | Patient had an EKG performed.                 |
| 7  | 1007                      | Check-up                  | Wilson          | Sophia             | Elizabeth           | Gynecology              | 1007                      | 7                    | 2023-01-07    | Patient underwent endoscopy procedure.        |
| 8  | 1008                      | Treatment                 | Miller          | Michael            | David               | Urology                 | 1008                      | 8                    | 2023-01-08    | Patient received colonoscopy.                 |
| 9  | 1009                      | Consultation              | Anderson        | Ava                | Grace               | Otolaryngology          | 1009                      | 9                    | 2023-01-09    | Patient had a mammography.                    |
| 10 | 1010                      | Surgery                   | Thomas          | Ethan              | Benjamin            | Radiology               | 1010                      | 10                   | 2023-01-10    | Patient received bone density test.           |
| 11 | 1011                      | Check-up                  | Martinez        | Isabella           | Lily                | Endocrinology           | 1011                      | 11                   | 2023-01-11    | Patient came in for allergy testing.          |
| 12 | 1012                      | Treatment                 | Harris          | Mia                | Charlotte           | Rheumatology            | 1012                      | 12                   | 2023-01-12    | Patient underwent pulmonary function test.    |
| 13 | 1013                      | Consultation              | Clark           | Abigail            | Elizabeth           | Hematology              | 1013                      | 13                   | 2023-01-13    | Patient had a nerve conduction study.         |
| 14 | 1014                      | Surgery                   | Lewis           | Elijah             | Alexander           | Nephrology              | 1014                      | 14                   | 2023-01-14    | Patient underwent sleep study.                |
| 15 | 1015                      | Check-up                  | Lee             | Amelia             | Madison             | Oncology                | 1015                      | 15                   | 2023-01-15    | Patient received gastroscopy.                 |

Рисунок 3.27 – SQL-запрос и таблица после выборки.

16) Вывести список пациентов, которым были выставлены последние 10 диагнозов с дополнительной информацией о диагнозе.

Таблицы «patient» и «diagnosis» представлены на рисунках 3.19 и 3.11.

На рисунке 3.28 приведены SQL-запрос и таблица после выборки.

1

SELECT \*

2

FROM patient FULL OUTER JOIN diagnosis

3

ON patient.history\_number = diagnosis.history\_number

4

WHERE diagnosis\_id IS NOT NULL

5

ORDER BY date\_ DESC LIMIT 10

6

Data Output

Messages

Notifications

history\_number

integer

type\_of\_treatment

text

surname

text

first\_name

text

middle\_name

text

department\_name

text

diagnosis\_id

integer

code

text

diagnosis\_name

text

date\_

date

history\_number

integer

1

1024

Treatment

Brown

Oliver

Matthew

Dermatology

24

D723

Skin Infection

2023-12-25

1024

2

1018

Surgery

Gonzalez

Evelyn

Victoria

Infectious Diseases

18

H821

Otitis Media

2023-12-19

1018

3

1006

Surgery

Taylor

Daniel

Joseph

Neurology

6

F201

Migraine

2023-12-02

1006

4

1010

Surgery

Thomas

Ethan

Benjamin

Radiology

10

J303

Bronchitis

2023-11-26

1010

5

1005

Consultation

Jones

Emma

Grace

Gastroenterology

15

E905

Allergic Rhinitis

2023-11-21

1005

6

1021

Consultation

Smith

Sophia

Grace

Cardiology

21

A001

Common Cold

2023-11-15

1021

7

1004

Treatment

Brown

Olivia

Sophia

Dermatology

4

D723

Skin Infection

2023-11-10

1004

8

1027

Check-up

Wilson

Olivia

Rose

Gynecology

27

G431

Urinary Tract Infection

2023-11-06

1027

9

1007

Check-up

Wilson

Sophia

Elizabeth

Gynecology

17

G431

Urinary Tract Infection

2023-10-25

1007

10

1007

Check-up

Wilson

Sophia

Elizabeth

Gynecology

7

G431

Urinary Tract Infection

2023-10-18

1007

Рисунок 3.28 – SQL-запрос и таблица после выборки.

## 4 Вывод

В ходе лабораторной работы было выполнено создание простых запросов на выборку данных на языке SQL с использованием предложений SELECT, FROM (JOINS), WHERE и ORDER BY оператора SELECT и рассмотрено использование скалярных функций