

# Day Care Project



*CSYE-6200*

*Object Oriented Design*

*Team:*

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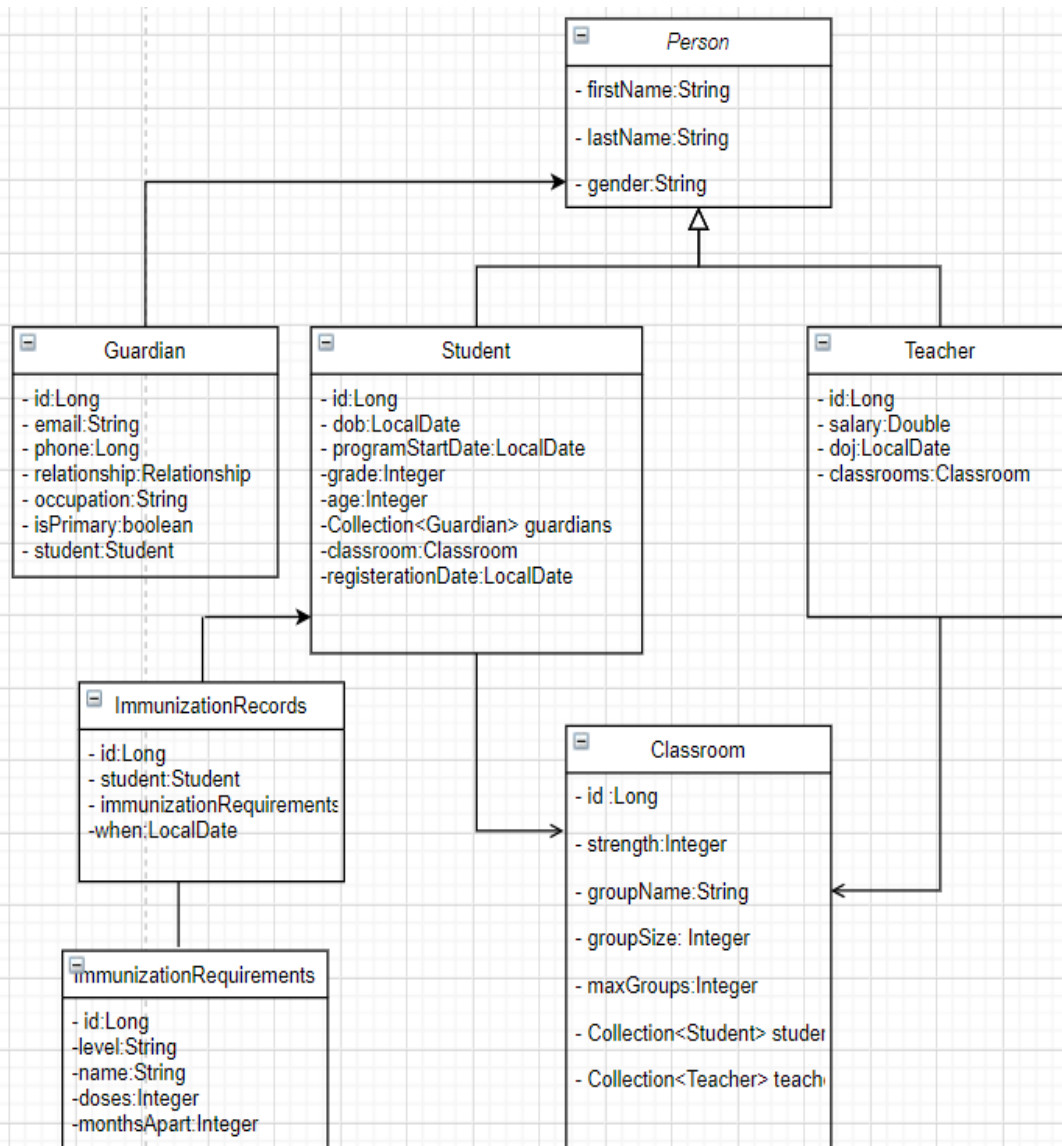
# Problem Statement

A Daycare model is to be created which captures the following defined deliverables:

- Student Enrollment: Attributes like Student name, age, Parent's name, address, phone
- Tracking of annual registration renewal
- Tracking of immunization anniversaries.
- Assignment of students to teachers according to the state regulations
- Assignment of student/teacher groups to classrooms according to state regulations.
- Meeting all the minimum requirements
- Using of Design Patterns:
  - Factory Design Pattern
  - Model View Controller Design Pattern
- Alerts for upcoming/overdue dates
  - Annual employee review
  - Annual registration from original walk-in-date
  - Track student immunization records
- Objects from CSV or use of Database (SQL){optional}
  - Students
  - Teachers
  - Daycare Ratio Rules
    - .1..1. Student to Teacher
    - .1..2. Groups to Classroom
  - Immunization Rules
  - Each Student's Immunization Record

# Proposed Solution

## Object Model Diagram



# Design Solution

The solution that we have approached for implementation of the Daycare system includes the following:

- Eclipse IDE
- Java
- PostgreSQL 10.16
- Spring boot framework
- Hibernate Framework
- Html, CSS, Bootstrap
- Spring boot Scheduler for Emails

The approach that we came up with was using a Spring boot framework which provided an Object Relational Mapping between the objects and attributes of the student, teacher, classroom classes in database. The database which has been used in the project is PostgreSQL. Hibernate is the ORM framework that has been implemented in the Daycare design which provides not only the Factory Design pattern but also Domain model pattern, Proxy design pattern, Query Design pattern and Data Mapper Pattern. The entity class(`@Entity`) annotation maps the objects attributes to the database which helps in perform the reading operation within. The tables inside the database are created using `@OneToMany` annotation for providing tables interlinkage. The controller class is used to perform the operation on the database and `@RequestMapping` is used to return the html pages created using CSS and bootstrap for rendering the UI on the server.

The model control view design is achieved by using Thymeleaf which is basically is HTML template engine. The bootstrap is used for providing design and styling of the UI screens.

The alerts for the upcoming vaccinations anniversaries and student and teacher's registration and enrollment anniversaries are handled using simple mailing scheduling service. The `JavaMailSender` Interface is utilized for sending mails. The configurations are set inside the `EmailConfiguration.java` class and the dependencies are provided in the `pom.xml`. The `@Service` annotation is used which makes the component scanning mechanism of spring analyze that the business logic for mailing implementation is provided inside that specified class file.

`UserService` is created for a single level system login entry which will have access to all the facilities that the daycare center provides. The multiple roles login can be created for the future implementation.

# Future Scope Implementation

In today's world the emerging need for importance of providing early education for a child and to provide a good childcare is resulting in high need for Childcare facilities.

The design which we have created is a single level implementation for a Childcare facility. The design can be enhanced by creating a whole ecosystem for such facility which involves interactions on multiple enterprise, network, and organization levels.

Current solution implements and provides login capabilities for a system user, but the future implementation could include the following:

- Providing Parental sign in and login access.
- Giving role base access to teachers and other working staff.
- Creating multiple roles like non-staff members and providing access to them for their respective workspace.
- Implementation of the Enquiry request workflow.
- Implementation of budgetary system for calculation of profits and loss.
- Based on the budgetary system implementation of new hiring modules, expansion modules etc.
- Implementation of a ranking system for providing information regarding effectiveness among others similar facilities.
- Including a CRM module to keep track of business-related workflows.
- Implementing GPS utilities to keep track of students and sending updates/notifications to the respective guardians.
- Creating mobile based application version.

# Snapshots

## UI Design

### Home Screen



## Enquiry Screen

### ENQUIRY FORM

If you have any concerns kindly take a moment to fill this form .Our Representatives will contact you shortly for assistance.

First Name	Last name	
<input type="text" value="Enter your first name."/>	<input type="text" value="Enter your last name."/>	
Email	Country code	Phone Number
<input type="text" value="Enter your email."/>	<input type="text" value="USA (+1)"/>	<input type="text" value="Enter Your Contact Number."/>
Customer Enquiry		
<input type="text" value="Enter Your Concern/Enquiry."/>		

Submit

## About Us Screen

# The DayCare

Best ChildCare provider

### About Our Program

#### OurPhilospophy

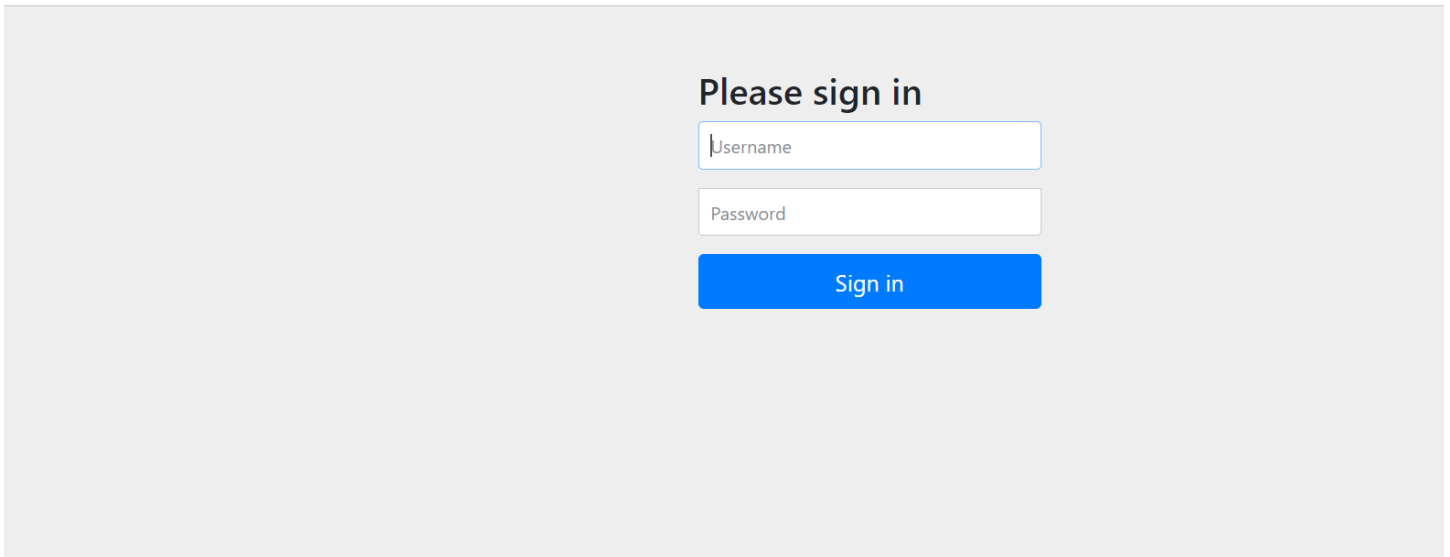
Our goal at the SunnySide Daycare is to build strong families to assist every child in our program to their fullest possible potential. To do this, we follow an age appropriate curriculum that consists of structured learning mixed with creative fun and play. We offer a caring developmentally appropriate hands on environment, which allows children to develop to their maximum potential. The program focuses on children's social, emotional, cognitive, and physical development through a variety of individual and group activities. Children's self esteem is also fostered and nurtured. Children are encouraged to respect themselves both as an individual and as a friend. We hope to develop curious, active learners with high self esteem.

### Parents Views

"Best chil' care facility!"  
CEO Facebook, Mark Zuckerberg



## Login screen



A login screen with a light gray background. In the center, the text "Please sign in" is displayed in a bold, dark font. Below this text are two input fields: the first is labeled "Username" and the second is labeled "Password". Both fields have a light gray border and a small vertical line on the left side. Below the password field is a blue button with the text "Sign in" in white.

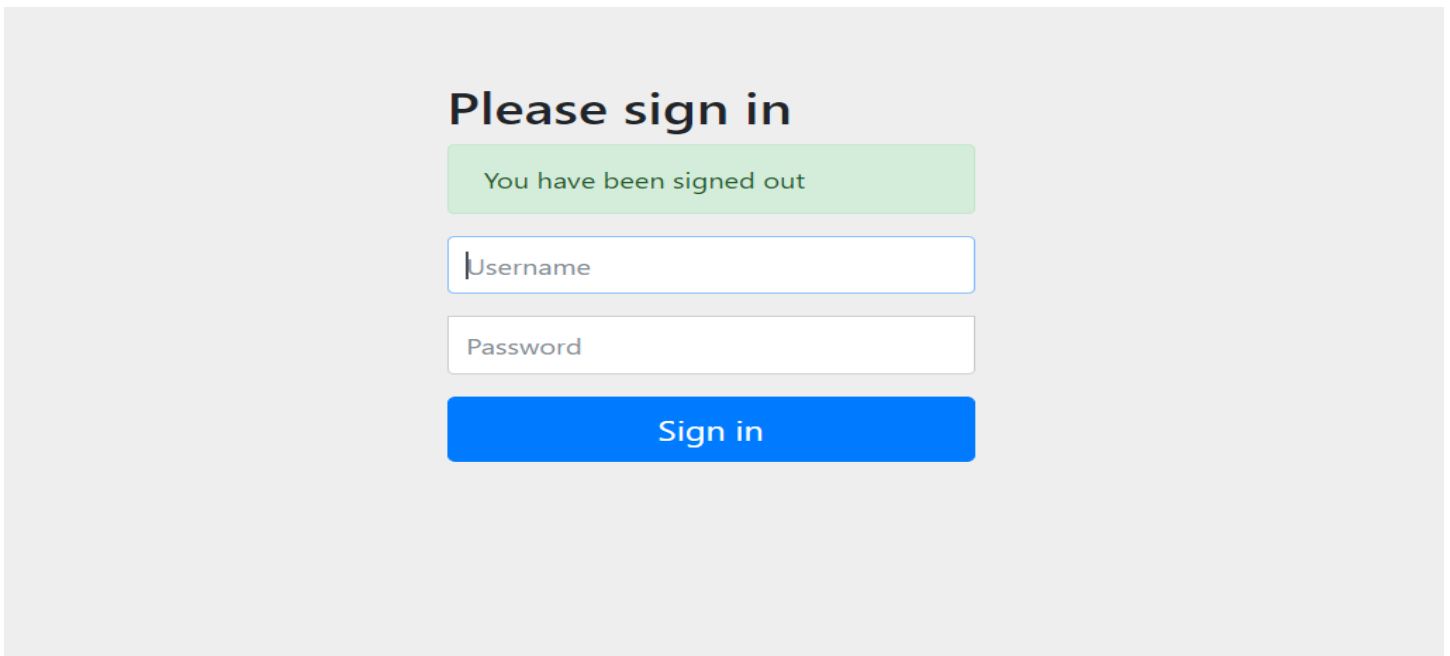
Please sign in

Username

Password

Sign in

## Logout Screen



A logout screen with a light gray background. In the center, the text "Please sign in" is displayed in a bold, dark font. Below this text is a green message box with the text "You have been signed out" in a dark font. Below the message box are two input fields: the first is labeled "Username" and the second is labeled "Password". Both fields have a light gray border and a small vertical line on the left side. Below the password field is a blue button with the text "Sign in" in white.

Please sign in

You have been signed out

Username

Password

Sign in

## Database

## Classroom Table

The screenshot shows the OMNI DB interface with the 'thedaycare' database selected. The left sidebar lists the database structure, including 'public.classroom'. The main console displays the SQL query: `select * from public.classroom t`. The query results show 6 rows in 0.081 seconds. The table structure is as follows:

		id	group_name	group_size	max_groups	strength
1	✗	1	Class A	4	3	12
2	✗	2	Class B	5	3	15
3	✗	3	Class C	6	3	18
4	✗	4	Class D	8	3	24
5	✗	5	Class E	12	2	24
6	✗	6	Class F	15	2	30
7	+					

## Guardian/Parent Table

The screenshot shows the OMNI DB interface with the 'thedaycare' database selected. The left sidebar lists the database structure, including 'public.guardian'. The main console displays the SQL query: `select * from public.guardian t`. The query results show 25 rows in 0.049 seconds. The table structure is as follows:

		id	first_name	gender	last_name	email	is_primary	occupation	phone	relationship	student_id
5	✗	5	Dorothy	2	Black	dorothy@gmail.com	False	Student	8896675567	0	5
6	✗	6	Nick	1	Brown	nick_brown@gmail.com	True	Engineer	9986767787	1	6
7	✗	7	Joe	1	Dickson	joe_345@gmail.com	True	Professor	7787783838	1	7
8	✗	8	Daniels	1	Black	dan_b@gmail.com	True	Scientist	887836388	1	5
9	✗	9	Nicholas	1	Peters	nicholas_peters@gmail.com	True	Surgeon	773836382	1	8
10	✗	10	Jack	1	Bakers	jack_bakers@gmail.com	True	Mechanic	77836388	1	9
11	✗	11	Sandy	2	Renaldi	sandy_renaldi@gmail.com	True	Doctor	72837484	2	10
12	✗	12	Torris	2	Williams	torris_william@gmail.com	True	Pediatrician	637287474	2	11
13	✗	13	Mariana	2	Shaw	mari@gmail.com	True	Magician	738374843	2	12
14	✗	14	Peters	1	Cyrus	petercyrus@gmail.com	True	Engineer	373673338	1	13
15	✗	15	Cane	1	Shonda	caneshonda@gmail.com	True	Designer	773677474	1	14
16	✗	16	Kristof	1	Gunther	kristof@gmail.com	True	CEO	773637373	1	15
17	✗	17	Karena	2	Ann	karenaann@gmail.com	True	Sales Executive	555373744	2	16
18	✗	18	Mandy	2	Sawyer	mandy123@gmail.com	True	Sales Representative	773637373	2	17
19	✗	19	Kat	2	Locke	kat_123@gmail.com	True	Fashion Designer	556337364	2	18
20	✗	20	Katy	2	Winters	katy_winters@gmail.com	True	Model	663736363	2	19
21	✗	21	Usher	1	Kare	usher_kare@gmail.com	True	Singer	662536332	1	20
22	✗	22	Catherine	2	Kare	catherine_k@gmail.com	True	Homemaker	233663544	2	21
23	✗	23	Coby	1	Reynolds	coby_re@gmail.com	True	Singer	776273774	1	22
24	✗	24	Thacher	1	Wells	thacher_wells@gmail.com	True	Doctor	773666647	1	23
25	✗	25	Phillips	1	Cody	phillips_cody@gmail.com	True	Data Scientist	663547873	1	24

## Student Table

Collapse menu

Connections

Add Connection

Welcome

Snippets

thedaycare

selected DB: thedaycare

Databases (2)

postgres

thedaycare

Schemas (3)

public

Tables (7)

classroom

guardian

immunization\_records

immunization\_requirements

student

teacher

users

Partitioned Tables

Inheritance Tables

Foreign Tables

Sequences

Views

Materialized Views

Functions

Trigger Functions

Event Trigger Functions

Aggregates

Types

Domains

pg\_catalog

information\_schema

Extensions

Properties

DDL

Console

Query

public.immunization\_records

public.student

+

select \* from public.student t

1 ORDER BY t.id

Query 100 rows 24 rows in 0.048 seconds

		id	first_name	gender	last_name	dob	grade	program_start_date	registration_date	classroom_id
4	X	4	Draco	1	Malfoy	2015-04-19	1	2020-02-15	2020-02-15	6
5	X	5	Markie	2	Black	2018-10-14	1	2019-04-15	2019-04-15	3
6	X	6	Bobby	1	Brown	2019-04-10	1	2020-05-02	2020-05-02	5
7	X	7	Evie	2	Dickson	2018-01-04	1	2020-05-05	2020-05-05	4
8	X	8	Becky	2	Peters	2018-12-04	1	2019-05-01	2019-05-01	3
9	X	9	Jessie	1	Bakers	2020-03-12	1	2021-03-05	2021-03-05	2
10	X	10	Jackie	2	Renaldi	2020-04-07	1	2021-04-04	2021-04-04	1
11	X	11	Laurie	2	Williams	2018-12-16	1	2020-04-30	2020-04-30	3
12	X	12	Cathey	2	Shaw	2020-04-22	1	2021-04-28	2021-04-28	1
13	X	13	Millie	2	Cyrus	2016-01-01	2	2017-05-06	2017-05-06	6
14	X	14	Ruthie	2	Shonda	2018-06-20	1	2019-04-29	2019-04-29	3
15	X	15	Stanley	1	Gunther	2016-11-20	1	2019-04-30	2019-04-30	5
16	X	16	Mary	2	Ann	2017-11-11	1	2019-05-01	2019-05-01	3
17	X	17	Annie	2	Sawyer	2018-10-05	1	2020-05-02	2020-05-02	3
18	X	18	Billy	1	Locke	2019-02-15	1	2021-04-27	2021-04-27	3
19	X	19	Rosie	2	Winters	2020-02-15	1	2021-03-30	2021-03-30	2
20	X	20	Fin	1	Kare	2019-08-20	1	2020-05-01	2020-05-01	2
21	X	21	Finley	1	Kare	2014-08-13	2	2016-05-02	2016-05-02	6
22	X	22	Jack	1	Reynolds	2015-10-13	2	2017-04-30	2017-04-30	6
23	X	23	Linda	2	Wells	2017-03-13	1	2020-05-02	2020-05-02	5
24	X	24	Karen	2	Cody	2016-05-16	1	2019-05-09	2019-05-09	5

## Teacher Table

selected DB: thedaycare

- guardian
- immunization\_records
- immunization\_requirements
- student
- teacher
- users
- Partitioned Tables
- Inheritance Tables
- Foreign Tables
- Sequences
- Views
- Materialized Views
- Functions
- Trigger Functions
- Event Trigger Functions
- Aggregates
- Types
- Domains
- pg\_catalog
- information\_schema
- Extensions
- Foreign Data Wrappers
- Event Triggers
- Logical Replication
- Tablespaces
- Roles
- Replication Slots

Console Query public.immunization\_records public.student

select \* from public.teacher t

1 ORDER BY t.id

Query 100 rows 16 rows in 0.049 seconds

		id	first_name	gender	last_name	doj	salary	classrooms_id
1	✗	1	Rebecca	2	Pan	2021-01-01	200067.7	1
2	✗	2	Monica	2	Grey	2020-05-05	360070.89	1
3	✗	3	Sara	2	Wilson	2019-04-01	80878.8	1
4	✗	4	Mark	1	Sloan	2020-06-01	95000.6	2
5	✗	5	Derek	1	Shepard	2017-05-02	100000.67	2
6	✗	6	Ellis	2	Evans	2021-04-30	150000.78	2
7	✗	7	Jessica	2	Fisher	2020-06-11	151800.78	3
8	✗	8	Robert	1	Munis	2017-04-30	257877.89	3
9	✗	9	Mina	2	Kendra	2018-04-29	208898.89	3
10	✗	10	Karen	2	Wills	2001-04-30	400787.89	4
11	✗	11	Smith	1	Do	2018-03-24	298778.78	4
12	✗	12	Rachael	2	Choo	2016-04-12	115656.89	4
13	✗	13	Jim	1	Carren	2019-05-12	345445.9	5
14	✗	14	Carrie	2	Bradshaw	2017-05-02	223445.9	5
15	✗	15	Jack	1	Emmet	2021-04-28	334324.89	6
16	✗	16	Bryan	1	Adams	2021-04-01	112323.9	6
17	+							

## User table

selected DB: thedaycare

- guardian
- immunization\_records
- immunization\_requirements
- student
- teacher
- users
- Partitioned Tables
- Inheritance Tables
- Foreign Tables
- Sequences
- Views
- Materialized Views
- Functions
- Trigger Functions
- Event Trigger Functions
- Aggregates

Console Query public.immunization\_records public.student public.teacher

+ select \* from public.users t

1 ORDER BY t.id

Query 10 rows 1 rows in 0.072 seconds

		id	user_password	username	usertype
1	✗	1	\$2a\$10\$CrsLvD.A1LM16PsSISMkAuoDHDVYyogsoo8bQBY54C8Hgbm1DuBma	user	admin
2	+				

## Immunization requirement Table

selected DB: thedaycare

- guardian
- immunization\_records
- immunization\_requirements
- student
- teacher
- users
- Partitioned Tables
- Inheritance Tables
- Foreign Tables
- Sequences
- Views
- Materialized Views
- Functions
- Trigger Functions
- Event Trigger Functions
- Aggregates
- Types
- Domains
- pg\_catalog
- information\_schema
- Extensions

Console Query public.student public.immunization\_requirements

```
select * from public.immunization_requirements t
```

Query 100 rows 10 rows in 0.072 seconds

		id	doses	level	months_apart	name
1	✗	1	1	preschool	0	MMR
2	✗	2	4	preschool	1	DTaP
3	✗	3	3	preschool	1	Polio
4	✗	4	1	preschool	1	Varicella
5	✗	5	2	kindergarten	1	MMR
6	✗	6	3	preschool	2	Hepatitis B
7	✗	7	3	preschool	2	Hib
8	✗	8	1	kindergarten	0	Polio
9	✗	9	1	kindergarten	2	DTaP
10	✗	10	1	kindergarten	1	Varicella
11	+					

## Immunization Record Table

- guardian
- immunization\_records
- immunization\_requirements
- student
- teacher
- users
- Partitioned Tables
- Inheritance Tables
- Foreign Tables
- Sequences
- Views
- Materialized Views
- Functions
- Trigger Functions
- Event Trigger Functions
- Aggregates
- Types
- Domains
- pg\_catalog
- information\_schema
- Extensions
- Foreign Data Wrappers
- Event Triggers
- Logical Replication
- Tablespaces
- Roles
- Replication Slots

Console Query public.student public.immunization\_requirements

```
select * from public.immunization_records t
```

Query 100 rows 40 rows in 0.073 seconds

		id	when_date	immunization_requirements_id	student_id
21	✗	21	2020-08-13	7	2
22	✗	22	2020-10-15	7	2
23	✗	23	2019-12-04	1	8
24	✗	24	2019-02-04	2	8
25	✗	25	2019-03-04	2	8
26	✗	26	2019-04-04	2	8
27	✗	27	2019-05-04	2	8
28	✗	28	2018-12-25	3	8
29	✗	29	2019-02-20	3	8
30	✗	30	2019-08-10	3	8
31	✗	31	2019-12-04	4	8
32	✗	32	2018-12-05	6	8
33	✗	33	2019-01-05	6	8
34	✗	34	2019-07-05	6	8
35	✗	35	2019-02-10	7	8
36	✗	36	2019-04-10	7	8
37	✗	37	2019-06-10	7	8
38	✗	39	2018-08-13	8	21
39	✗	40	2015-08-13	5	21
40	✗	41	2015-09-13	5	21