Imiona i nazwiska autorów:

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Opis projektu Klub 100 kilo:

Projekt polega na stworzeniu prostej aplikacji webowej służącej do zarządzania treningami na siłowni. Użytkownik ma mozliwość zarezerwować daną siłownię z naszej bazy danych oraz renera o ile jedno i druie są dostępne.

Schemat bazy danych i opis tabeli:

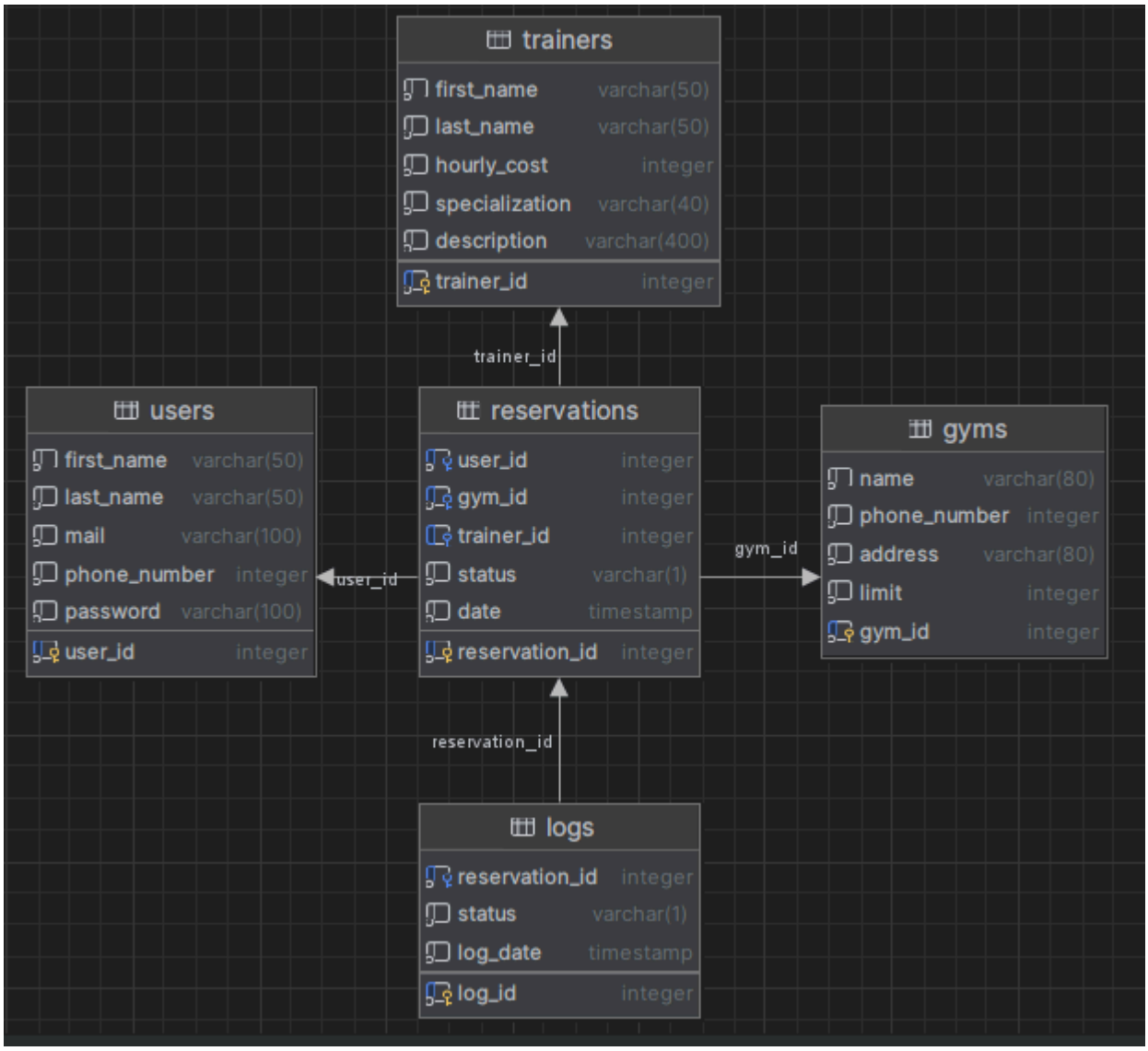


Tabela: Users

Przechowuje informacje o użytkownikach.

Kolumna	Typ	Opis
user_ID	SERIAL	Klucz główny
first_name	varchar(50)	Imię użytkownika
last_name	varchar(50)	Nazwisko użytkownika
mail	varchar(100)	Email użytkownika
phone_number	int	Numer telefonu użytkownika
password	varchar(100)	Hasło użytkownika

Tabela: Trainers

Przechowuje informacje o trenerach.

Kolumna	Typ	Opis
trainer_ID	SERIAL	Klucz główny
first_name	varchar(50)	Imię trenera
last_name	varchar(50)	Nazwisko trenera
hourly_cost	int	Koszt godzinny trenera
specialization	varchar(40)	Specjalizacja trenera
description	varchar(400)	Opis trenera

Tabela: Gyms

Przechowuje informacje o siłowniach.

Kolumna	Typ	Opis
gym_ID	SERIAL	Klucz główny
name	varchar(80)	Nazwa siłowni
phone_number	int	Numer telefonu siłowni
address	varchar(80)	Adres siłowni
limit	int	Limit miejsc w siłowni

Tabela: Reservations

Przechowuje informacje o rezerwacjach.

Kolumna	Typ	Opis
reservation_ID	SERIAL	Klucz główny
user_ID	int	Klucz obcy do tabeli Users
gym_ID	int	Klucz obcy do tabeli Gyms
trainer_ID	int	Klucz obcy do tabeli Trainers
status	varchar(1)	Status rezerwacji
date	timestamp	Data rezerwacji (każdy trening trwa 2 godziny)

Tabela: Logs

Przechowuje logi zmian rezerwacji.

Kolumna	Typ	Opis
log_ID	SERIAL	Klucz główny
reservation_ID	int	Klucz obcy do tabeli Reservations
status	int	Status rezerwacji
trainer_id	int	Przypisany nowy trener
log_date	date	Data logu

Proste operacje CRUD

Create na przykładzie add_reservation:

```
create procedure add_reservation(IN p_user_id integer, IN p_gym_id integer, IN p_date timestamp without time zo
    language plpgsql
as
$$
BEGIN
    INSERT INTO Reservations (user_ID, gym_ID, trainer_ID, status, date)
    VALUES (p_user_ID, p_gym_ID, p_trainer_ID, 'A', p_date);
    RAISE NOTICE 'Reservation added successfully.';
END;
$$;

alter procedure add_reservation(integer, integer, timestamp, integer) owner to postgres;
```

```python
class AddReservationAPIView(APIView):
    serializer_class = ReservationSerializer

    @swagger_auto_schema(request_body=ReservationSerializer)
    def post(self, request, *args, **kwargs):
        request_data = request.data.copy()

        if request_data.get('trainer_ID') == 0:
            request_data['trainer_ID'] = None

        serializer = self.serializer_class(data=request_data)
        if serializer.is_valid():
            data = serializer.validated_data
            with connection.cursor() as cursor:
                try:
                    date_without_tz = data['date'].strftime('%Y-%m-%d %H:%M:%S')

                    cursor.execute("CALL add_reservation(%s, %s, %s, %s)", [
                        data['user_ID'],
                        data['gym_ID'],
                        date_without_tz,
                        data['trainer_ID'],
                    ])

                    return Response({'message': 'Reservation added successfully'}, status=status.HTTP_201_CREAT
                except Exception as e:
                    return Response({'error': str(e)}, status=status.HTTP_400_BAD_REQUEST)
        else:
            return Response(serializer.errors, status=status.HTTP_400_BAD_REQUEST)
```

```python
class ReservationSerializer(serializers.Serializer):
    reservation_ID = serializers.IntegerField(read_only=True)
    user_ID = serializers.IntegerField()
    gym_ID = serializers.IntegerField()
    trainer_ID = serializers.IntegerField(allow_null=True, required=False, default=None)
    status = serializers.CharField(max_length=1, default='A')
    date = serializers.DateTimeField()
```

```python
urlpatterns = [
    path('api/reservation/add_reservation/', AddReservationAPIView.as_view(), name='api_add_reservation'),
    path("new_reservation/", new_reservation_view, name="new_reservation"),
]
```

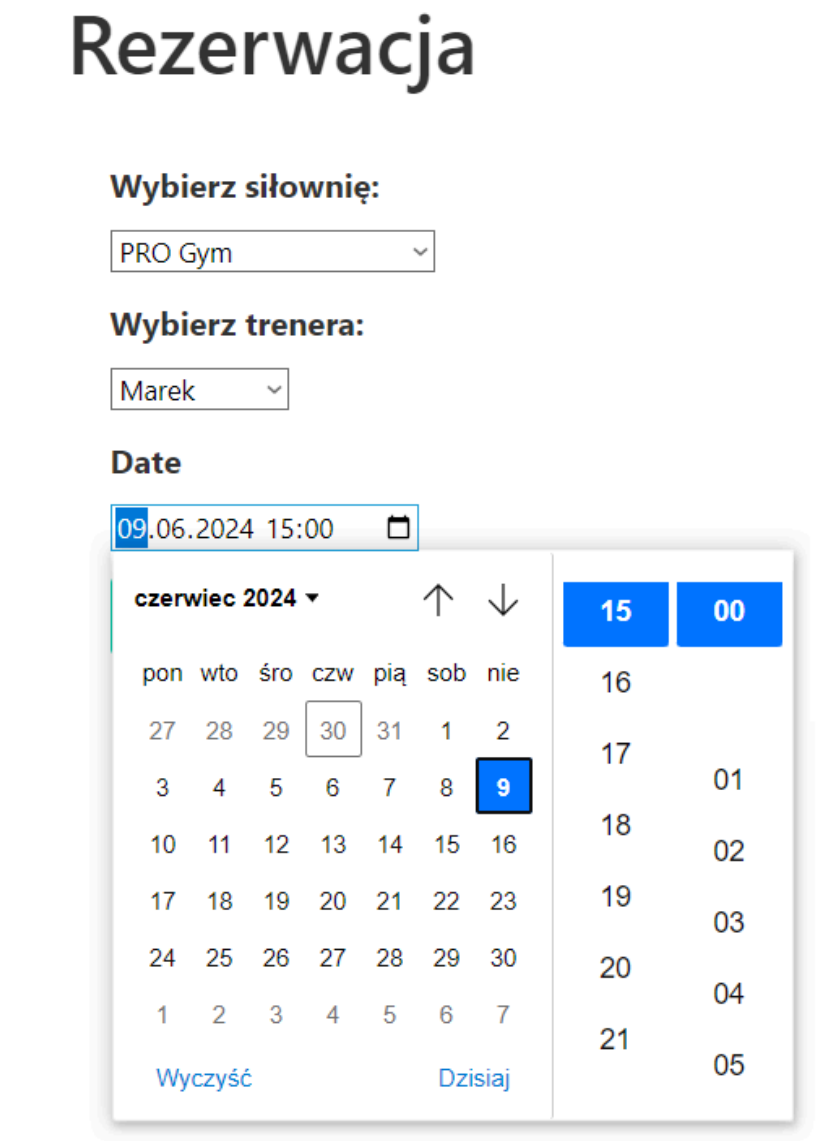
```python
class ReservationForm(forms.Form):
    user_ID = forms.IntegerField(widget=forms.HiddenInput())
    gym_ID = forms.ChoiceField(choices=get_gyms, label="Wybierz siłownię:")
    trainer_ID = forms.ChoiceField(choices=get_trainers, required=False, label="Wybierz trenera:")
    date = forms.DateTimeField(
        input_formats=['%Y-%m-%dT%H:%M:%S.%fZ'],
        widget=forms.DateTimeInput(attrs={'type': 'datetime-local'})
    )
```

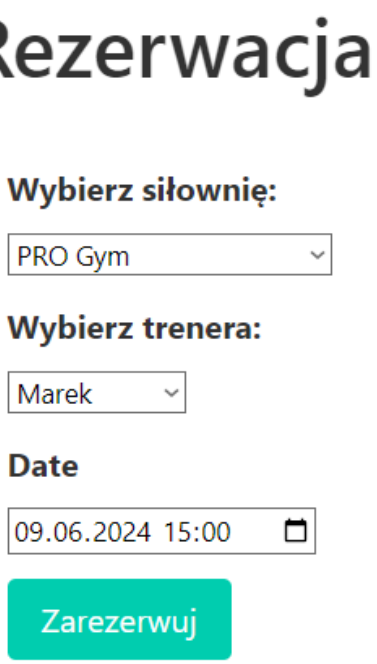
```
    def clean_trainer_ID(self):
        trainer_id = self.cleaned_data.get('trainer_ID')
        return 0 if trainer_id == '0' else trainer_id
```

```
def new_reservation_view(request):
    user_id = request.COOKIES.get('user_id')
    if user_id is None:
        return redirect('login')
    else:
        if request.method == 'POST':
            form = ReservationForm(request.POST)
            if form.is_valid():
                data = {
                    'user_ID': form.cleaned_data['user_ID'],
                    'gym_ID': form.cleaned_data['gym_ID'],
                    'trainer_ID': form.cleaned_data['trainer_ID'],
                    'date': form.cleaned_data['date'].strftime('%Y-%m-%dT%H:%M:%S.%fZ'),
                }
                api_url = request.build_absolute_uri(reverse('api_add_reservation'))
                response = requests.post(api_url, json=data)
                if response.status_code != 201:
                    print(f"API request failed with status code {response.status_code}")
        else:
            form = ReservationForm(initial={'user_ID': user_id})
        return render(request, "new_reservation.html", {'form': form})
```

```
<link rel="stylesheet" href="../static/styles/new_reservation.css" />
<section class="section">
  <div class="container">
      <h2 class="title is-2">Rezerwacja</h2>
      <form method="post">
        {% csrf_token %}
        <div class="field">
          <div class="control">
            {{ form.user_ID }}
          </div>
        </div>
        <div class="field">
          <label class="label">{{ form.gym_ID.label }}</label>
          <div class="control">
            {{ form.gym_ID }}
          </div>
        </div>
        <div class="field">
          <label class="label">{{ form.trainer_ID.label }}</label>
          <div class="control">
            {{ form.trainer_ID }}
          </div>
        </div>
        <div class="field">
          <label class="label">{{ form.date.label }}</label>
          <div class="control">
            {{ form.date }}
          </div>
        </div>
        <div class="field">
```

```
          <div class="control">
            <button type="submit" class="button is-primary">Zarezerwuj</button>
          </div>
        </div>
      </form>
    </div>
</section>
```





e_1 [Gyms@localhost] | reservations [Gyms@localhost] | users [Gyms@localhost] | gyms [Gyms@localhost] | trainers [Gyms@localho

13 rows | Tx: Auto | DDL | CSV

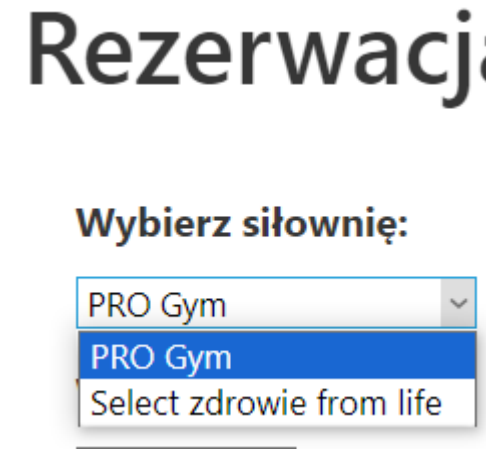
WHERE | ORDER BY

	reservation_id	user_id	gym_id	trainer_id	status	date
1	1	14	1	1	A	2024-05-22 00:55:40.000000
2	2	14	1	1	A	2024-05-23 05:57:00.000000
3	3	14	1	1	A	2024-06-07 07:57:00.000000
4	4	14	1	1	A	2024-06-07 07:57:00.000000
5	7	14	2	1	A	2024-05-23 08:00:30.000000
6	8	14	2	1	A	2024-05-23 06:00:30.000000
7	10	14	2	1	A	2024-05-23 12:00:30.000000
8	15	15	1	2	A	2024-07-20 17:28:00.000000
9	13	15	1	<null>	C	2024-05-22 12:00:00.000000
10	14	15	1	1	A	2024-06-14 16:07:00.000000
11	16	15	2	2	A	2024-04-30 17:46:00.000000
12	17	15	2	1	A	2024-04-04 17:46:00.000000
13	22	9	1	2	A	2024-06-09 17:00:00.000000

Read na przykładzie get_gyms:

```
def get_gyms():
    with connection.cursor() as cursor:
        cursor.execute("SELECT gym_ID, name FROM gyms")
        return cursor.fetchall()
```

```
class ReservationForm(forms.Form):
    --- reszta kodu ---
    gym_ID = forms.ChoiceField(choices=get_gyms, label="Wybierz siłownię:")
    --- reszta kodu ---
```



Update na przykładzie cancel_reservation:

```
create procedure cancel_reservation(IN p_reservation_id integer)
    language plpgsql
as
$$
BEGIN
    UPDATE Reservations
```

```
    SET status = 'C'
    WHERE reservation_ID = p_reservation_ID;
    RAISE NOTICE 'Reservation cancelled successfully.';
END;
$$;

alter procedure cancel_reservation(integer) owner to postgres;
```

```
class CancelReservationAPIView(APIView):
    serializer_class = UpdateReservationSerializer

    @swagger_auto_schema(manual_parameters=[
        openapi.Parameter('reservation_id', openapi.IN_PATH, description="Reservation ID", type=openapi.TYPE_IN
    ])
    def put(self, request, reservation_id, *args, **kwargs):
        with connection.cursor() as cursor:
            try:
                # Call the stored procedure
                cursor.execute("CALL cancel_reservation(%s)", [reservation_id])
                return Response({'message': 'Reservation cancelled successfully'}, status=status.HTTP_200_OK)
            except Exception as e:
                # If an error occurs, return a 400 error with detailed message
                return Response({'error': 'An error occurred: {}'.format(e)}, status=status.HTTP_400_BAD_REQUES
```

```
class UpdateReservationSerializer(serializers.Serializer):
    reservation_ID = serializers.IntegerField(read_only=True)
    user_ID = serializers.IntegerField(read_only=True)
    gym_ID = serializers.IntegerField(read_only=True)
    trainer_ID = serializers.IntegerField(allow_null=True, required=False, default=None)
    status = serializers.CharField(max_length=1, default='A')
    date = serializers.DateTimeField(read_only=True)
```

```
urlpatterns = [
    path('api/reservation/cancel_reservation/<int:reservation_id>/', CancelReservationAPIView.as_view(),name='a
    path("modify_reservation/", modify_reservation_view, name="modify_reservation"),
]
```

```
class ModifyReservationForm(forms.Form):
    reservation_id = forms.IntegerField(widget=forms.HiddenInput())
    trainer_ID = forms.ChoiceField(choices=[], required=False, label="Wybierz trenera:")

    def clean_trainer_ID(self):
        trainer_id = self.cleaned_data.get('trainer_ID')
        return 0 if trainer_id == '0' else trainer_id

    def __init__(self, *args, **kwargs):
        super(ModifyReservationForm, self).__init__(*args, **kwargs)
        self.fields['trainer_ID'].choices = get_trainers()
```

```python
def modify_reservation_view(request):
    user_id = request.COOKIES.get('user_id')
    if user_id is None:
        return redirect('login')

    # Fetch gym names using SQL query
    reservations_with_gym_names = {}
    with connection.cursor() as cursor:
        cursor.execute("""
            SELECT r.reservation_ID, g.name AS gym_name
            FROM reservations r
            INNER JOIN gyms g ON r.gym_ID = g.gym_ID
            WHERE r.user_ID = %s AND r.status = 'A'
        """, [user_id])
        for row in cursor.fetchall():
            reservation_id, gym_name = row
            reservations_with_gym_names[reservation_id] = gym_name

    # Fetch active reservations for the logged-in user using API
    api_url = request.build_absolute_uri(reverse('get_reservations', args=[user_id]))
    response = requests.get(api_url)
    reservations = []
    if response.status_code == 200:
        for res in response.json():
            if res['status'] == 'A':
                # Update each reservation with the gym name
                res['gym_name'] = reservations_with_gym_names.get(res['reservation_id'], 'Unknown Gym')
                reservations.append(res)
    else:
        print(f"API request failed with status code {response.status_code}")

    form = ModifyReservationForm()

    form.fields['trainer_ID'].choices = get_trainers()

    return render(request, "modify_reservation.html", {'active_reservations': reservations, 'form': form})
```

```html
<section class="section">
  <div class="container">
    <table class="table is-fullwidth is-striped is-hoverable">
      <thead>
        <tr>
          <th>Gym</th>
          <th>Trainer</th>
          <th>Date and Time</th>
          <th>Add/Change Trainer</th>
        </tr>
      </thead>
      <tbody>
        {% for reservation in active_reservations %}
        <tr>
          <td>{{ reservation.gym_name }}</td>
          <td>{{ reservation.trainer_id }}</td>
          <td>{{ reservation.date }}</td>
          <td>
            --- reszta kodu ---
            <form method="post" action="{% url 'cancel_reservation' reservation.reservation_id %}">
              {% csrf_token %}
```

```
            <input type="hidden" name="reservation_id" value="{{ reservation.reservation_id }}">
            <button class="button is-danger inline-button" type="submit" name="cancel">Cancel Reservation</bu
          </form>
        </td>
      </tr>
      {% endfor %}
    </tbody>
  </table>
 </div>
</section>
```

Operacja o charakterze transakcyjnym

Przykład transakcji na przykładzie add_reservation:

Kod i przykład zaprezentowany w sekcji Create. Przy tworeniu i modyfikowaniu rezerwacji uruchamiane są triggery, które zarządzają naszymi zasobami. Każda siłownia ma nadany limit osób, które mogą mieć rezerwacje w danym czasie, trenerzy mogą zajmować się tylko jedną osobą w danym czasie. Zarówno siłowine jak i trenerzy pracują 24/7. Trenerzy pracują na każdej siłownii.

Funkcja do sprawdzania dostępności trenera:

```
create function check_trainer_availability(p_trainer_id integer, p_date timestamp without time zone) returns bo
    language plpgsql
as
$$
DECLARE
    v_reservations INT;
BEGIN
    SELECT COUNT(*) INTO v_reservations
    FROM Reservations
    WHERE trainer_ID = p_trainer_ID
    AND status = 'A'
    AND NOT (date  + INTERVAL '2 hours' <= p_date OR date >= p_date + INTERVAL '2 hours');
```

```
    RETURN v_reservations = 0;
END;
$$;

alter function check_trainer_availability(integer, timestamp) owner to postgres;
```

Funkcja do sprawdzania dostępności siłowni:

```
create function check_gym_availability(p_gym_id integer, p_date timestamp without time zone) returns boolean
    language plpgsql
as
$$
DECLARE
    v_limit INT;
    v_reservations INT;
BEGIN
    SELECT "limit" INTO v_limit FROM Gyms WHERE gym_ID = p_gym_ID;
    SELECT COUNT(*) INTO v_reservations FROM Reservations WHERE gym_ID = p_gym_ID AND NOT (date  + INTERVAL '2
    RETURN v_reservations < v_limit;
END;
$$;

alter function check_gym_availability(integer, timestamp) owner to postgres;
```

Trigger wykorzystujący poprzednie funkcje:

```
    create function reservation_trigger() returns trigger
    language plpgsql
as
$$
BEGIN
    IF NEW.status = 'A' THEN
        IF NOT check_gym_availability(NEW.gym_ID, NEW.date) THEN
            RAISE EXCEPTION 'The gym is fully booked at the selected time.';
        END IF;
        IF NEW.trainer_ID IS NOT NULL AND NOT check_trainer_availability(NEW.trainer_ID, NEW.date) THEN
            RAISE EXCEPTION 'The trainer is not available at the selected time.';
        END IF;
    END IF;
    RETURN NEW;
END;
$$;

alter function reservation_trigger() owner to postgres;
```

Trigger, zapisujący zmiany w naszych rezerwacjach:

```
create function log_reservation_changes() returns trigger
    language plpgsql
as
$$
BEGIN
```

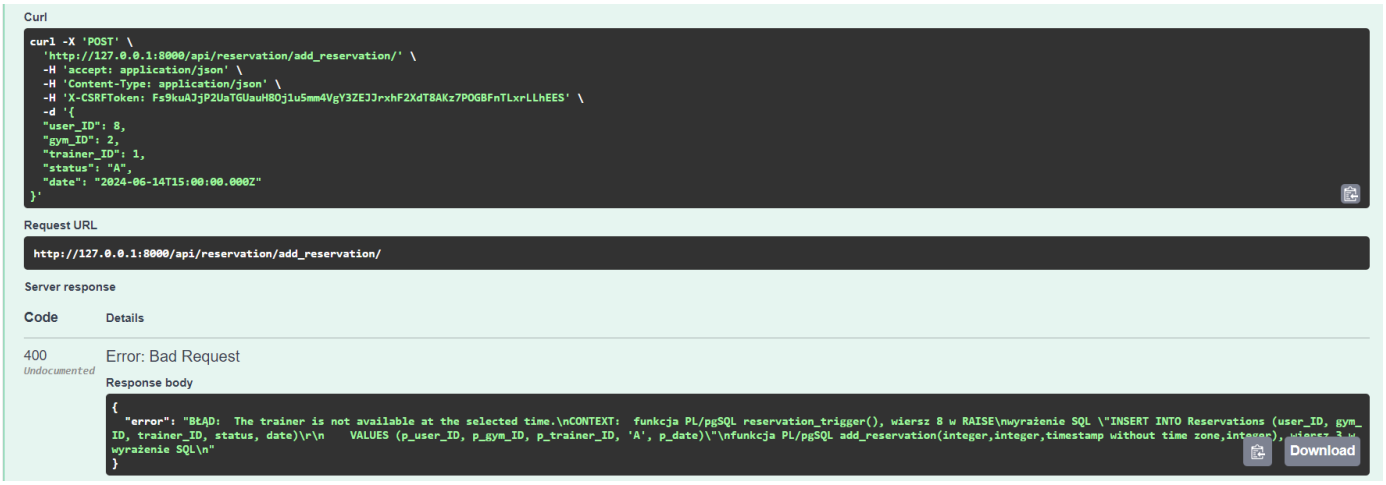
```
    INSERT INTO logs (reservation_id, status, trainer_id, log_date)
    VALUES (NEW.reservation_id, NEW.status, NEW.trainer_id, CURRENT_TIMESTAMP);
    RETURN NEW;
END;
$$;

alter function log_reservation_changes() owner to postgres;
```

Trigger sprawdzający czy modyfikowane bądź dodawane rezerwacje nie są w przeszłości:

```
create function check_reservation_date() returns trigger
    language plpgsql
as
$$
BEGIN
    IF NEW.date < CURRENT_DATE THEN
        RAISE EXCEPTION 'Cannot add or modify a reservation with a date in the past.';
    END IF;
    RETURN NEW;
END;
$$;

alter function check_reservation_date() owner to postgres;
```



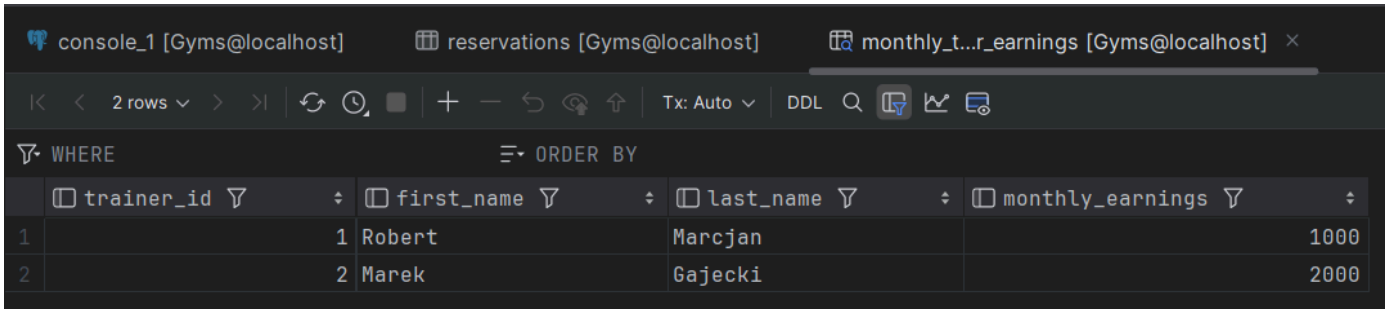
	log_id	reservation_id	status	trainer_id	log_date
1	5	22	A	2	2024-05-31 11:02:42.610155
2	6	22	C	2	2024-05-31 11:32:04.886718

Operacje o charakterze raportującym

Przykład raportu na przykładzie monthly_trainer_earnings:

```
CREATE OR REPLACE VIEW monthly_trainer_earnings AS
SELECT
    t.trainer_id,
    t.first_name,
```

```
    t.last_name,
    COUNT(r.reservation_id) * t.hourly_cost * 2 AS monthly_earnings
FROM
    Trainers t
JOIN
    Reservations r ON t.trainer_id = r.trainer_id
WHERE
    r.status = 'A' AND r.date BETWEEN (CURRENT_DATE - INTERVAL '1 month') AND CURRENT_DATE
GROUP BY
    t.trainer_id, t.first_name, t.last_name;
```



	trainer_id	first_name	last_name	monthly_earnings
1	1	Robert	Marcjan	1000
2	2	Marek	Gajecki	2000