

**Министерство науки и высшего образования Российской Федерации
ФЕДЕРАЛЬНОЕ ГОСУДАРСТВЕННОЕ АВТОНОМНОЕ
ОБРАЗОВАТЕЛЬНОЕ УЧРЕЖДЕНИЕ ВЫСШЕГО ОБРАЗОВАНИЯ
«Национальный исследовательский университет ИТМО»
(Университет ИТМО)**

Факультет Инфокоммуникационных технологий (ИКТ)

Образовательная программа Мобильные и сетевые технологии

О Т Ч Е Т

Back-end лабораторная работа №2

Тема задания: ««Тестирование, разработка и документирование RESTful API»

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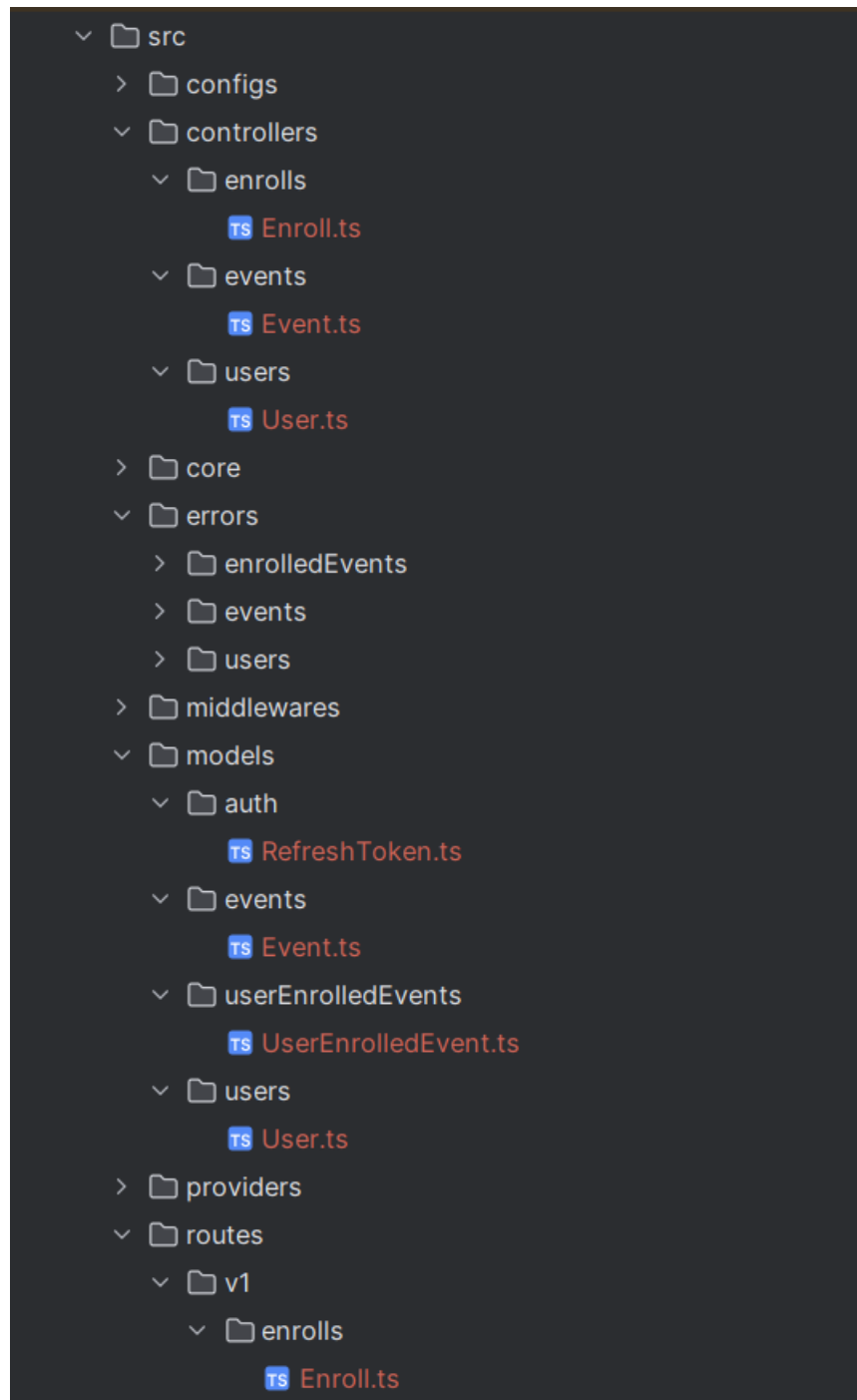
Санкт-Петербург
2023

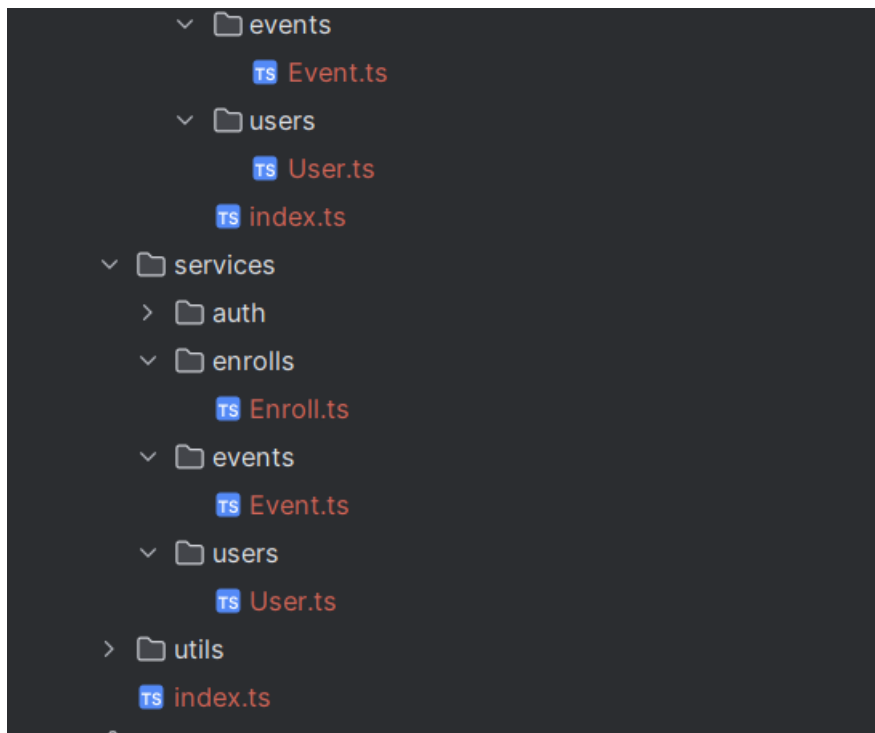
Задача

По выбранному варианту необходимо будет реализовать RESTful API средствами express + typescript (используя ранее написанный boilerplate).
Вариант: Платформа для поиска мероприятий в Санкт-Петербурге.

Ход работы:

Структура приложения:



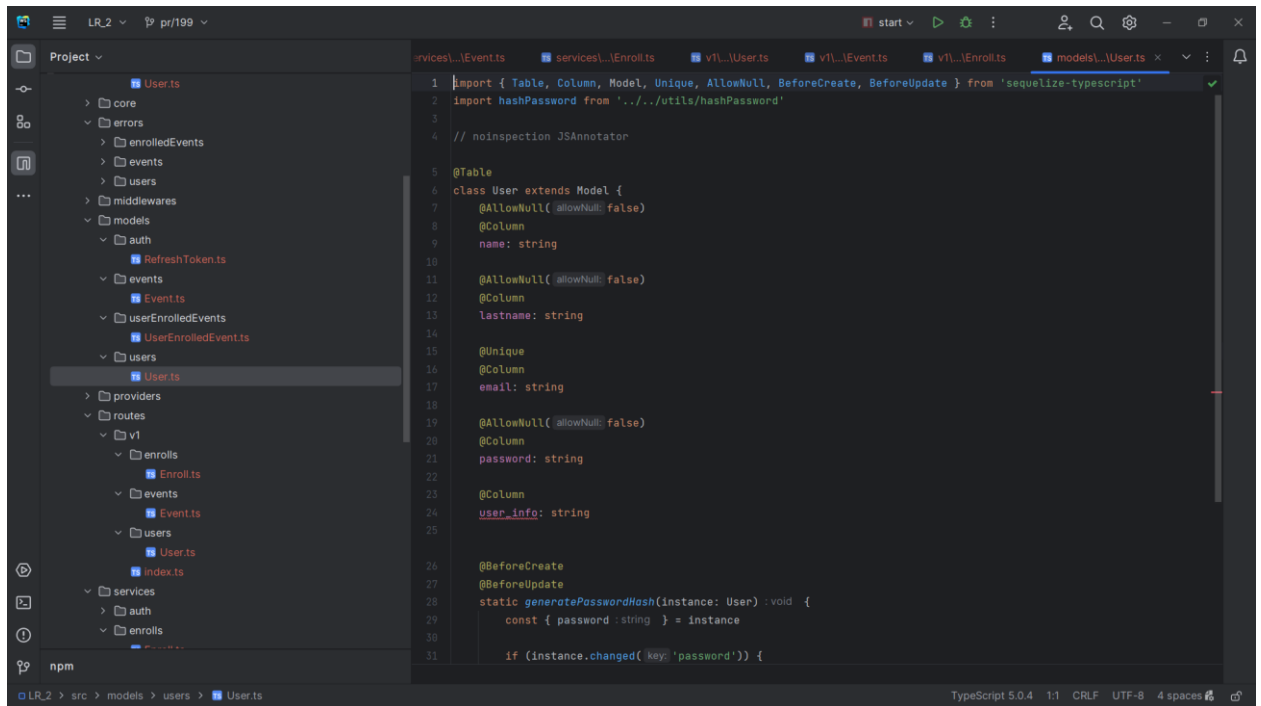


Где

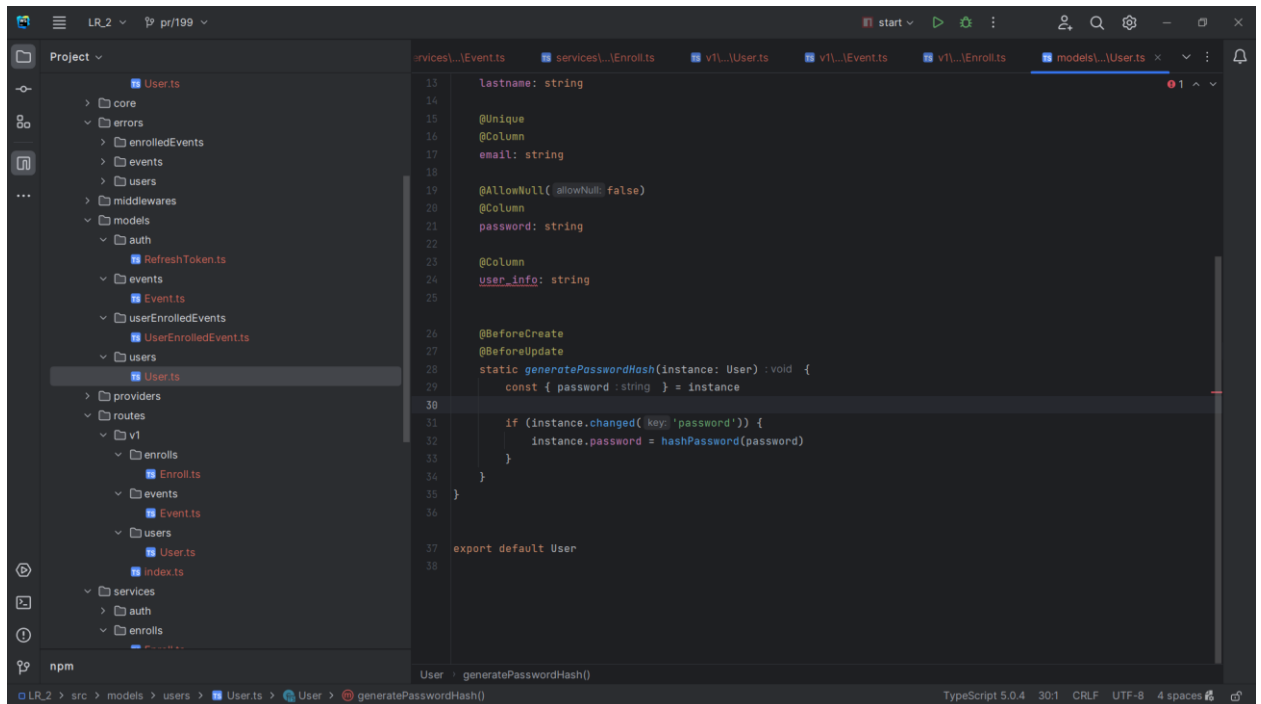
- core – точка входа в приложение;
- configs – файлы конфигурации (файл для подключения к БД);
- controllers – контроллеры, отвечающие за логику обработки httpзапросов;
- models – модели sequelize; •providers – точки доступа к данным;
- routes – описание маршрутов;
- services – службы, которые содержат запросы к базе данных и возвращают объекты или выдают ошибки;
- utils – вспомогательные файлы, которые используются в приложении;
- middlewares - содержит аутентификацию с использованием passport.ts

Модели:

User.ts – модель пользователя

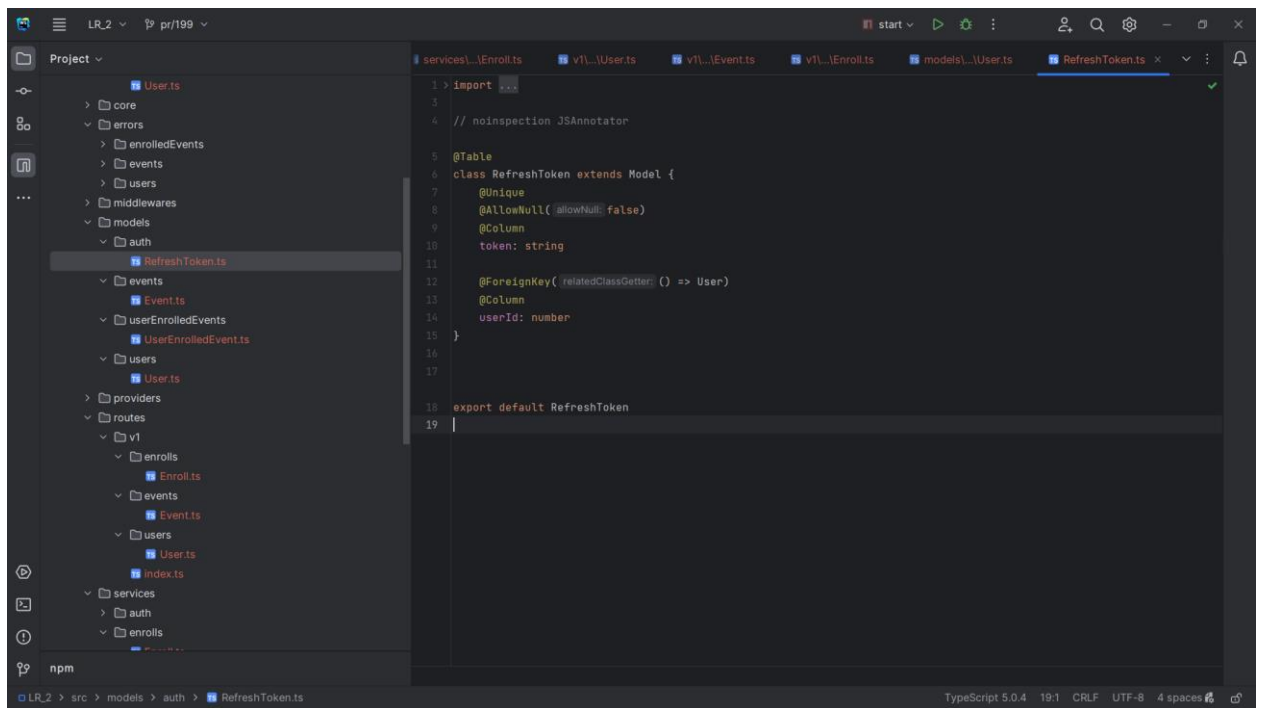


```
1 import { Table, Column, Model, Unique, AllowNull, BeforeCreate, BeforeUpdate } from 'sequelize-typescript'
2 import hashPassword from '../../utils/hashPassword'
3
4 // noinspection JSAnnotator
5
6 @Table
7 class User extends Model {
8   @AllowNull({ allowNull: false })
9   @Column
10   name: string
11
12   @AllowNull({ allowNull: false })
13   @Column
14   lastname: string
15
16   @Unique
17   @Column
18   email: string
19
20   @AllowNull({ allowNull: false })
21   @Column
22   password: string
23
24   @Column
25   user_info: string
26
27   @BeforeCreate
28   @BeforeUpdate
29   static generatePasswordHash(instance: User) : void {
30     const { password : string } = instance
31
32     if (instance.changed( key: 'password')) {
```

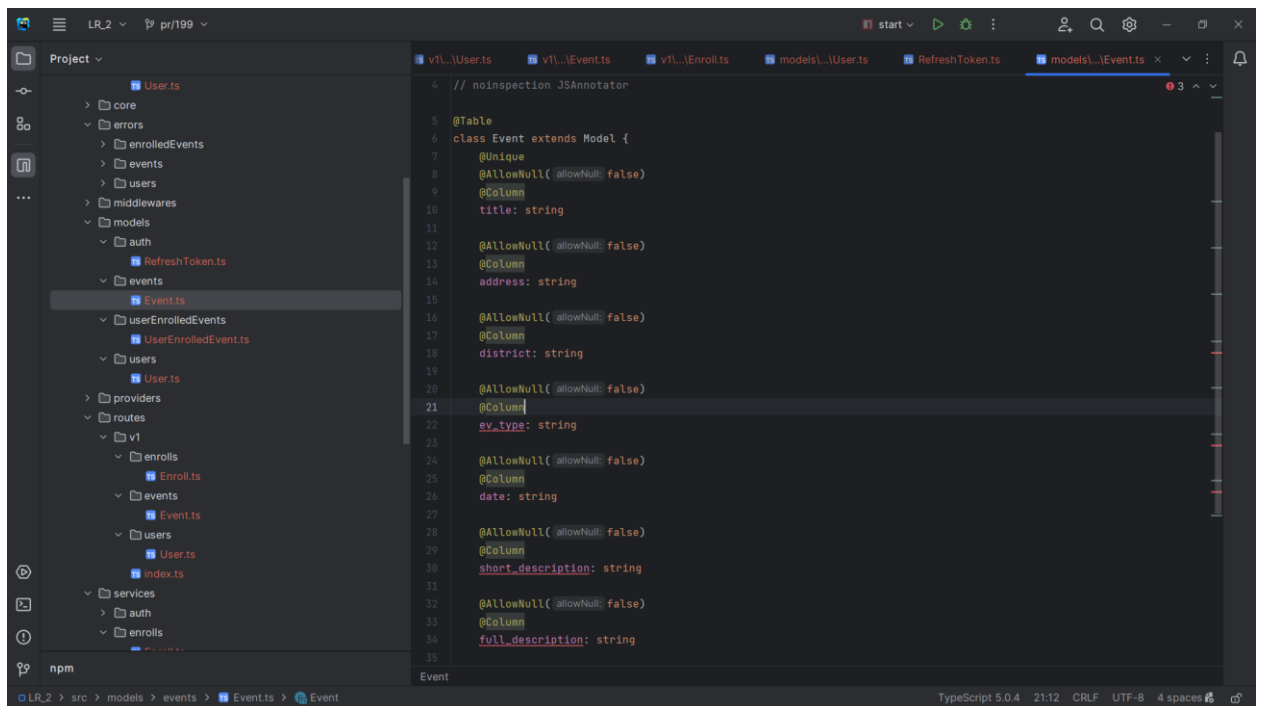


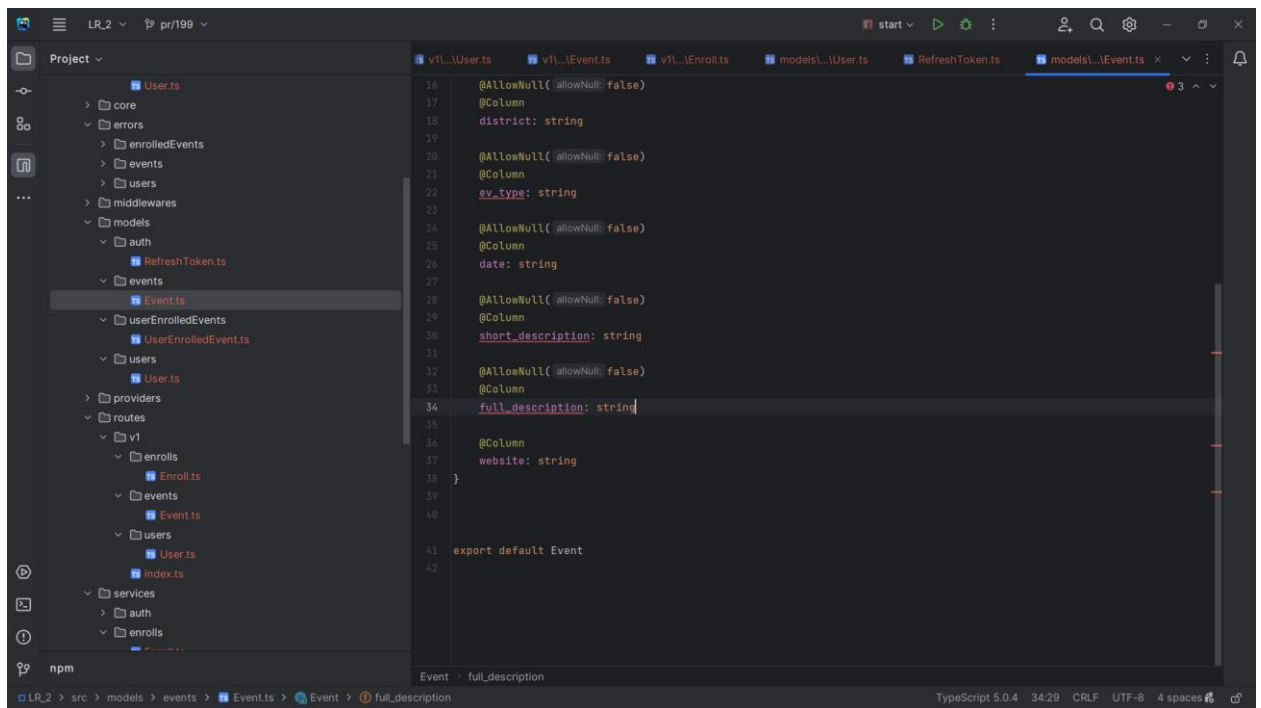
```
33       instance.password = hashPassword(password)
34     }
35   }
36
37   export default User
38
39   User > generatePasswordHash()
```

RefreshToken.ts - модель хранения токенов

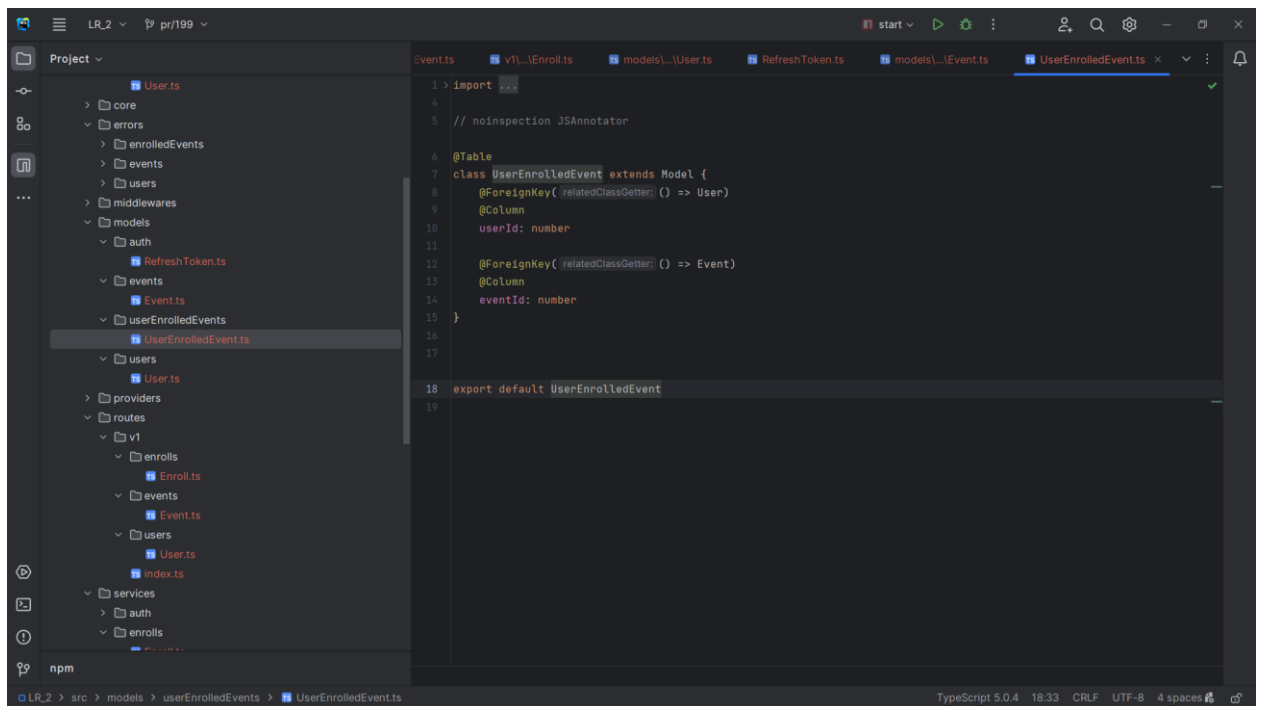


Event.ts – модель мероприятия





UserEnrolledEvents.ts – модель мероприятий пользователей



Новые функции в контроллерах:

User.ts

```
119 } catch (error: any) {
120   response.status(404).send({ "error": error.message })
121 }
122 }
123
124 update = async (request: any, response: any) : Promise<void> => {
125   try {
126     const { body } = request;
127     const { id } = request.params
128     const user : User = await this.userService.changeUserInfo(Number(id), body);
129
130     response.send(user);
131   } catch (error: any) {
132     response.status(400).send(error.message);
133   }
134 }
135
136 delete = async (request: any, response: any) : Promise<void> => {
137   try {
138     await this.userService.deleteUser(request.params.id)
139     response.send('User deleted')
140   } catch (error: any) {
141     response.sendStatus(400)
142   }
143 }
144 }
145
146 export default UserController
147
```

Event.ts

```
1 import EventService from '../services/events/Event'
2 import { Request, Response } from 'express'
3
4 class EventController {
5   private eventService: EventService
6
7   constructor() {
8     this.eventService = new EventService()
9   }
10
11   getAll = async (request: Request, response: Response) : Promise<void> => {
12     const events : Event[] = await this.eventService.getAll()
13     response.status(200).send(events)
14   }
15
16   get = async (request: Request, response: Response) : Promise<void> => {
17     try {
18       const event : Event = await this.eventService.getById(Number(request.params.id))
19       response.send(event)
20     } catch (error: any) {
21       response.status(404).send({body: {error: error.message}})
22     }
23   }
24
25   post = async (request: Request, response: Response) : Promise<void> => {
26     const {body} = request
27
28
```

```
26 post = async (request: Request, response: Response) : Promise<void> => {
27   const {body} = request
28
29   try {
30     const event : Event | EventError = await this.eventService.create(body)
31     response.status( code: 201).send(event)
32   } catch (error: any) {
33     response.status( code: 400).send( {body: {error: error.message}})
34   }
35 }
36
37
38 d_filter = async (request: any, response: any) : Promise<void> => {
39   try {
40     const events : Event[] | EventError = await this.eventService.d_filter(request.params.district)
41     response.send(events)
42   } catch (error: any) {
43     response.status(404).send({error: error.message})
44   }
45 }
46
47
48 t_filter = async (request: any, response: any) : Promise<void> => {
49   try {
50     const events : Event[] | EventError = await this.eventService.t_filter(request.params.ev_type)
51     response.send(events)
52   } catch (error: any) {
53     response.status(404).send({error: error.message})
54   }
55 }
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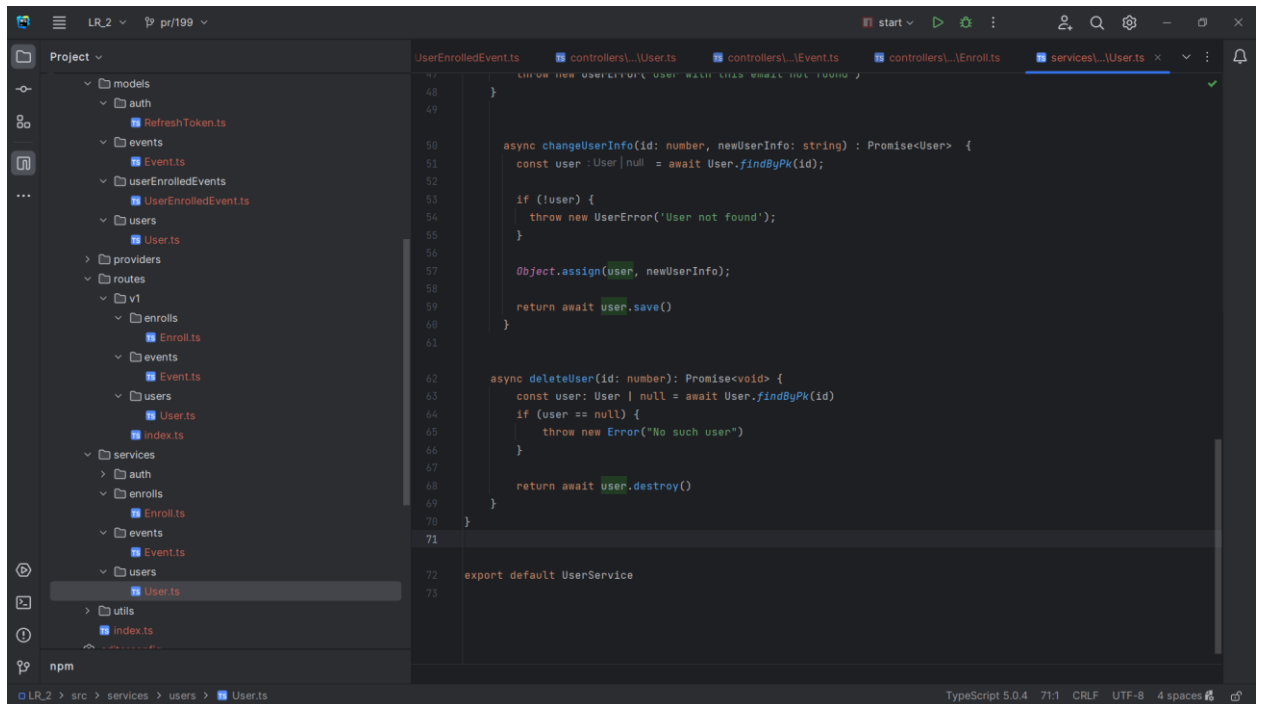


```
1 import { Request, Response } from 'express'
2 import EnrollService from "../../services/enrolls/Enroll";
3
4 class EnrollController {
5     private enrollService: EnrollService
6
7     constructor() {
8         this.enrollService = new EnrollService()
9     }
10
11     getAll = async (request: Request, response: Response) : Promise<void> => {
12         const enrolls : UserEnrolledEvent[] = await this.enrollService.getAll()
13         response.status( code: 200 ).send(enrolls)
14     }
15
16     post = async (request: Request, response: Response) : Promise<void> => {
17         const {body} = request
18
19         try {
20             const enroll : UserEnrolledEvent | EnrolledEv... = await this.enrollService.create(body)
21             response.status( code: 201 ).send(enroll)
22         } catch (error: any) {
23             response.status( code: 400 ).send( {body: {error: error.message}} )
24         }
25     }
26
27     delete = async (request: any, response: any) : Promise<void> => {
```

```
27
28     delete = async (request: any, response: any) : Promise<void> => {
29         try {
30             await this.enrollService.delete(request.params.id)
31             response.send('Enroll deleted')
32         } catch (error: any) {
33             response.sendStatus( code: 400 )
34         }
35     }
36
37     getUserEnrolls = async (request: any, response: any) : Promise<void> => {
38         try {
39             const enrolls : UserEnrolledEvent[] | Enrolled... = await this.enrollService.getUserEnrolls(
40                 request.params.userId
41             )
42
43             response.send(enrolls)
44         } catch (error: any) {
45             response.status(404).send({ "error": error.message })
46         }
47     }
48 }
49
50 export default EnrollController
51
```

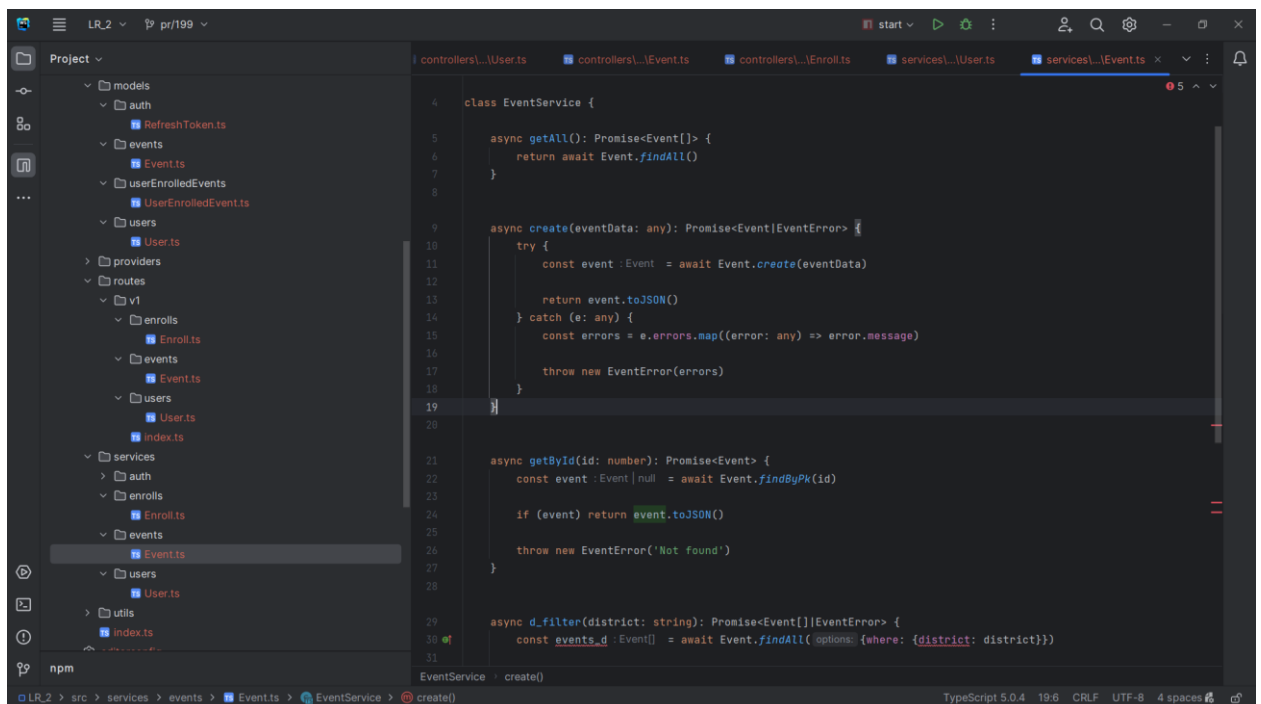
Новые функции в сервисах:

User.ts



```
47  // throw new UserError('User with this email not found')
48
49
50
51  async changeUserInfo(id: number, newUserInfo: string) : Promise<User> {
52    const user : User | null = await User.findByPk(id);
53
54    if (!user) {
55      throw new UserError('User not found');
56    }
57
58    Object.assign(user, newUserInfo);
59
60    return await user.save()
61  }
62
63  async deleteUser(id: number): Promise<void> {
64    const user: User | null = await User.findByPk(id)
65    if (user == null) {
66      throw new Error("No such user")
67    }
68
69    return await user.destroy()
70  }
71
72  export default UserService
73
```

Event.ts



```
4  class EventService {
5
6    async getAll(): Promise<Event[]> {
7      return await Event.findAll()
8    }
9
10   async create(eventData: any): Promise<Event>|EventError {
11     try {
12       const event : Event = await Event.create(eventData)
13
14       return event.toJSON()
15     } catch (e: any) {
16       const errors = e.errors.map((error: any) => error.message)
17
18       throw new EventError(errors)
19     }
20   }
21
22   async getById(id: number): Promise<Event> {
23     const event : Event | null = await Event.findByPk(id)
24
25     if (event) return event.toJSON()
26
27     throw new EventError('Not found')
28   }
29
30   async d_filter(district: string): Promise<Event[]>|EventError {
31     const events_d : Event[] = await Event.findAll({where: {district: district}})
32   }
33 }
34
35 export default EventService
```

```
21 async getById(id: number): Promise<Event> {
22   const event : Event | null = await Event.findByIdPk(id)
23
24   if (event) return event.toJSON()
25
26   throw new EventError('Not found')
27 }
28
29 async d_filter(district: string): Promise<Event[]>|EventError> {
30   const events_d : Event[] = await Event.findAll({where: {district: district}})
31
32   if (events_d) return events_d
33
34   throw new EventError('Events in this district not found')
35 }
36
37 async t_filter(ev_type: string): Promise<Event[]>|EventError> {
38   const events_t : Event[] = await Event.findAll({where: {ev_type: ev_type}})
39
40   if (events_t) return events_t
41
42   throw new EventError('Events of this type not found')
43 }
44 }
45
46 export default EventService
47
EventService : create()
```

Enroll.ts

```
1 import UserEnrolledEvent from '../models/userEnrolledEvents/UserEnrolledEvent'
2 import EnrolledEventError from '../errors/enrolledEvents/EnrolledEventError';
3
4 class EnrollService {
5
6   async getAll(): Promise<UserEnrolledEvent[]> {
7     return await UserEnrolledEvent.findAll()
8   }
9
10  async create(enrollData: any): Promise<UserEnrolledEvent|EnrolledEventError> {
11    try {
12      const enroll : UserEnrolledEvent = await UserEnrolledEvent.create(enrollData)
13
14      return enroll.toJSON()
15    } catch (e: any) {
16      const errors = e.errors.map((error: any) => error.message)
17
18      throw new EnrolledEventError(errors)
19    }
20  }
21
22  async delete(id: number): Promise<void> {
23    const enroll: UserEnrolledEvent | null = await UserEnrolledEvent.findByIdPk(id)
24    if (enroll == null) {
25      throw new Error("No such enrolling")
26    }
27
28    return await enroll.destroy()
29  }
30 }
31
EnrollService : create()
```

```
16 |         throw new EnrolledEventError(errors)
17 |     }
18 | }
19 |
20 |
21 | async delete(id: number): Promise<void> {
22 |     const enroll: UserEnrolledEvent | null = await UserEnrolledEvent.findById(id)
23 |     if (enroll == null) {
24 |         throw new Error("No such enrolling")
25 |     }
26 |
27 |     return await enroll.destroy()
28 | }
29 |
30 |
31 | async getUserEnrolls(userId: number): Promise<UserEnrolledEvent[]> | EnrolledEventError {
32 |     const enrolls: UserEnrolledEvent[] = await UserEnrolledEvent.findAll({options: {where: {userId}}})
33 |
34 |     if (enrolls) return enrolls
35 |
36 |     throw new EnrolledEventError('User with this id not found')
37 | }
38 |
39 | export default EnrollService
40 |
```

Routes:

User.ts

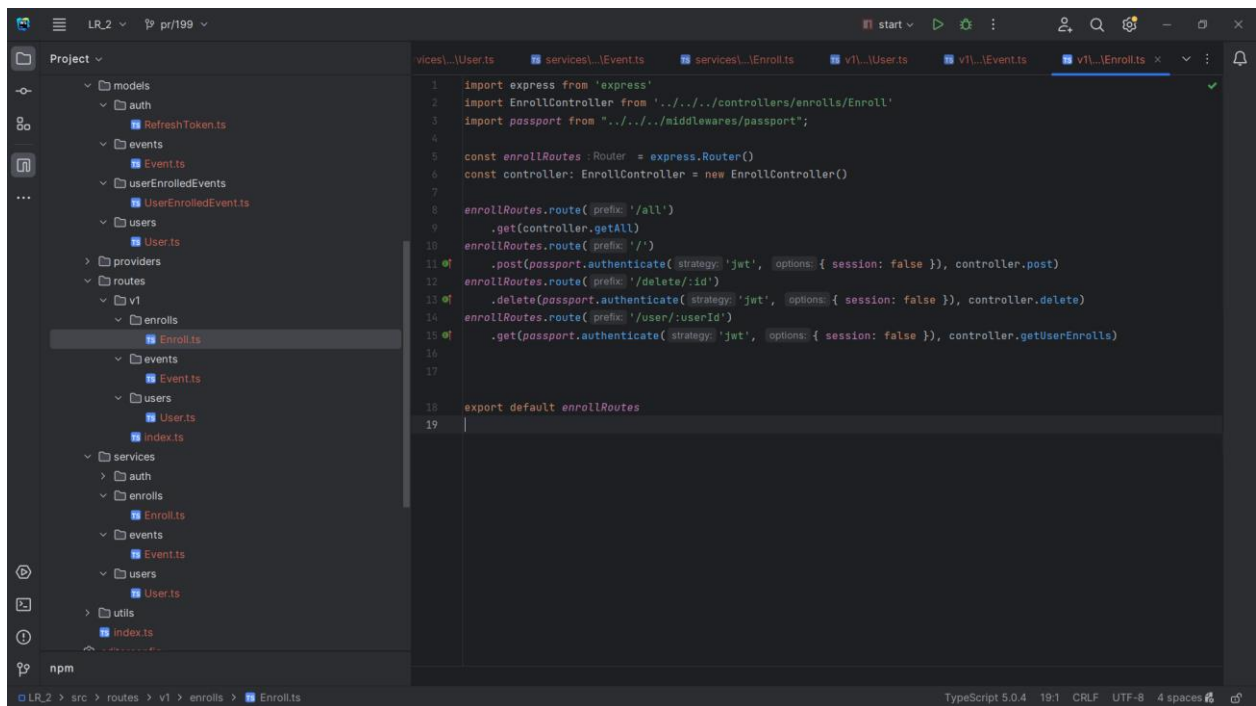
```
1 | import express from "express"
2 | import UserController from "../controllers/users/User"
3 | import passport from "../middlewares/passport"
4 |
5 | const router: express.Router = express.Router()
6 |
7 | const controller: UserController = new UserController()
8 |
9 | router.route( prefix: '/' )
10 |   .post(controller.post)
11 |
12 | router.route( prefix: '/profile' )
13 |   .get(passport.authenticate( strategy: 'jwt', options: { session: false } ), controller.me)
14 |
15 | router.route( prefix: '/profile/:id' )
16 |   .get(controller.get)
17 |
18 | router.route( prefix: '/login' )
19 |   .post(controller.auth)
20 |
21 | router.route( prefix: '/refresh' )
22 |   .post(controller.refreshToken)
23 |
24 | router.route( prefix: '/all' )
25 |   .get(controller.getAll)
26 |
27 | router.route( prefix: '/:email' )
28 |   .get(controller.getByEmail)
29 |
30 | router.route( prefix: '/update/:id' )
31 |   .put(passport.authenticate( strategy: 'jwt', options: { session: false } ), controller.update)
32 |
33 | router.route( prefix: '/delete/:id' )
```

```
11 router.route( prefix: '/profile' )
12   .get(passport.authenticate( strategy: 'jwt', options: { session: false } ), controller.me)
13
14
15 router.route( prefix: '/profile/:id' )
16   .get(controller.get)
17
18 router.route( prefix: '/login' )
19   .post(controller.auth)
20
21 router.route( prefix: '/refresh' )
22   .post(controller.refreshToken)
23
24 router.route( prefix: '/all' )
25   .get(controller.getAll)
26
27 router.route( prefix: '/:email' )
28   .get(controller.getEmail)
29
30 router.route( prefix: '/update/:id' )
31   .put(passport.authenticate( strategy: 'jwt', options: { session: false } ), controller.update)
32
33 router.route( prefix: '/delete/:id' )
34   .delete(passport.authenticate( strategy: 'jwt', options: { session: false } ), controller.delete)
35
36 export default router
37
```

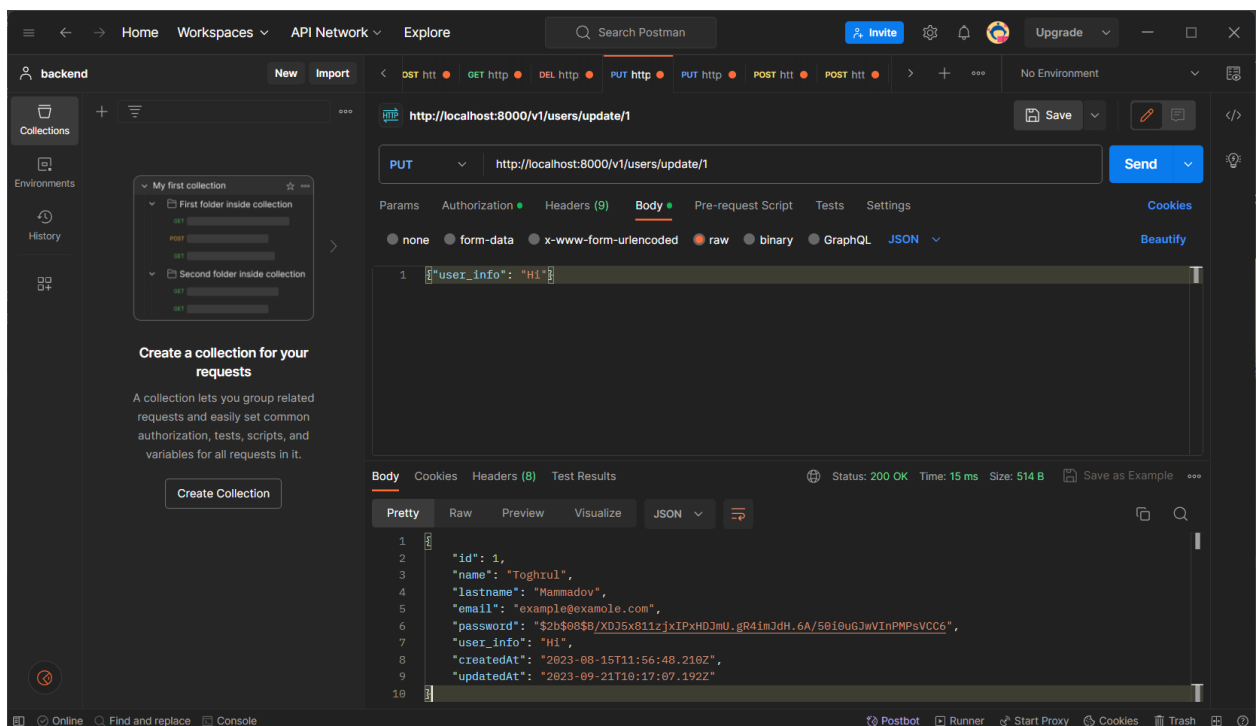
Event.ts

```
1 import express from 'express'
2 import EventController from '../../controllers/events/Event'
3
4 const eventRoutes : Router = express.Router()
5 const controller: EventController = new EventController()
6
7 eventRoutes.route( prefix: '/all' )
8   .get(controller.getAll)
9 eventRoutes.route( prefix: '/' )
10   .post(controller.post)
11 eventRoutes.route( prefix: '/:id' )
12   .get(controller.get)
13 eventRoutes.route( prefix: '/dfilter/:district' )
14   .get(controller.d_filter)
15 eventRoutes.route( prefix: '/tfilter/:ev_type' )
16   .get(controller.t_filter)
17
18
19 export default eventRoutes
20
```

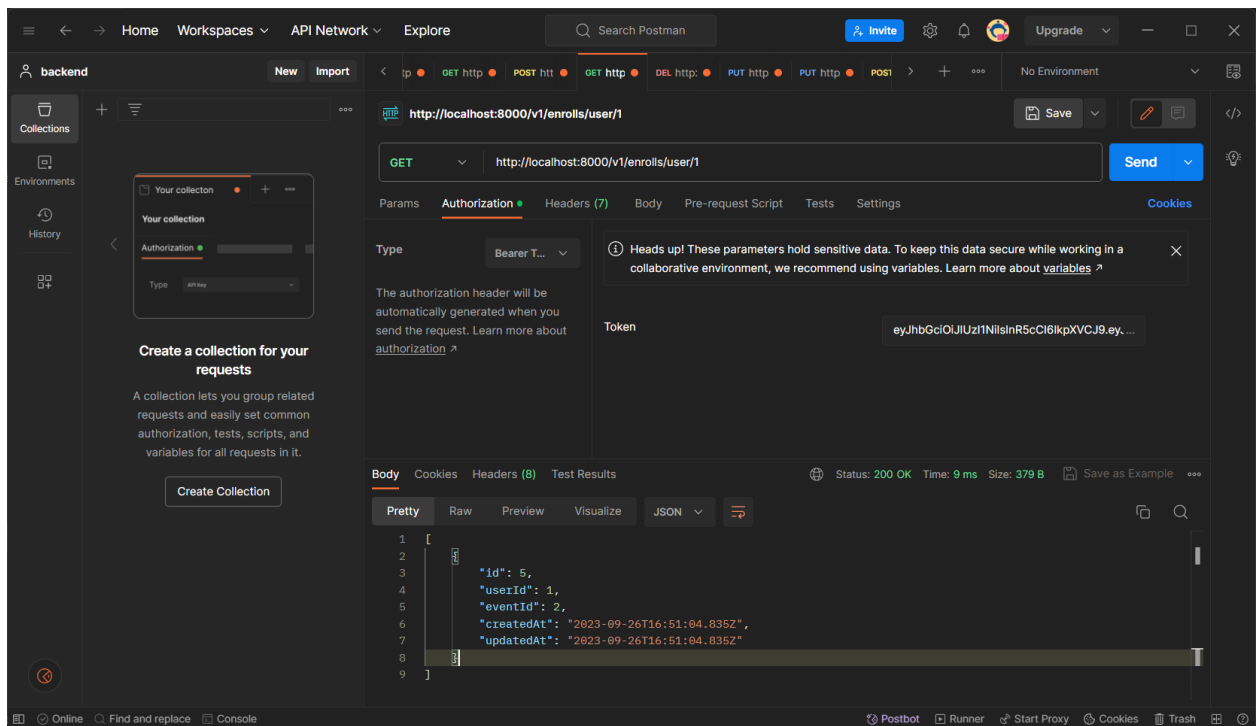
Enroll.ts



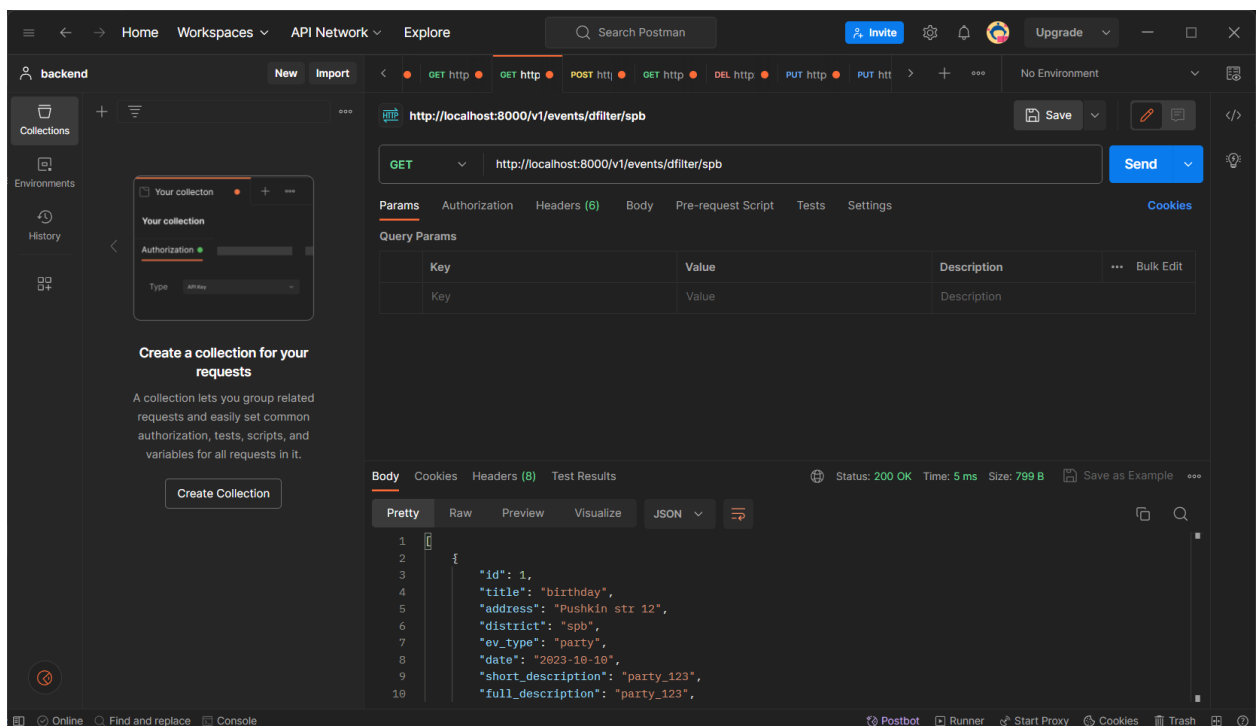
Обновление информации о пользователе:



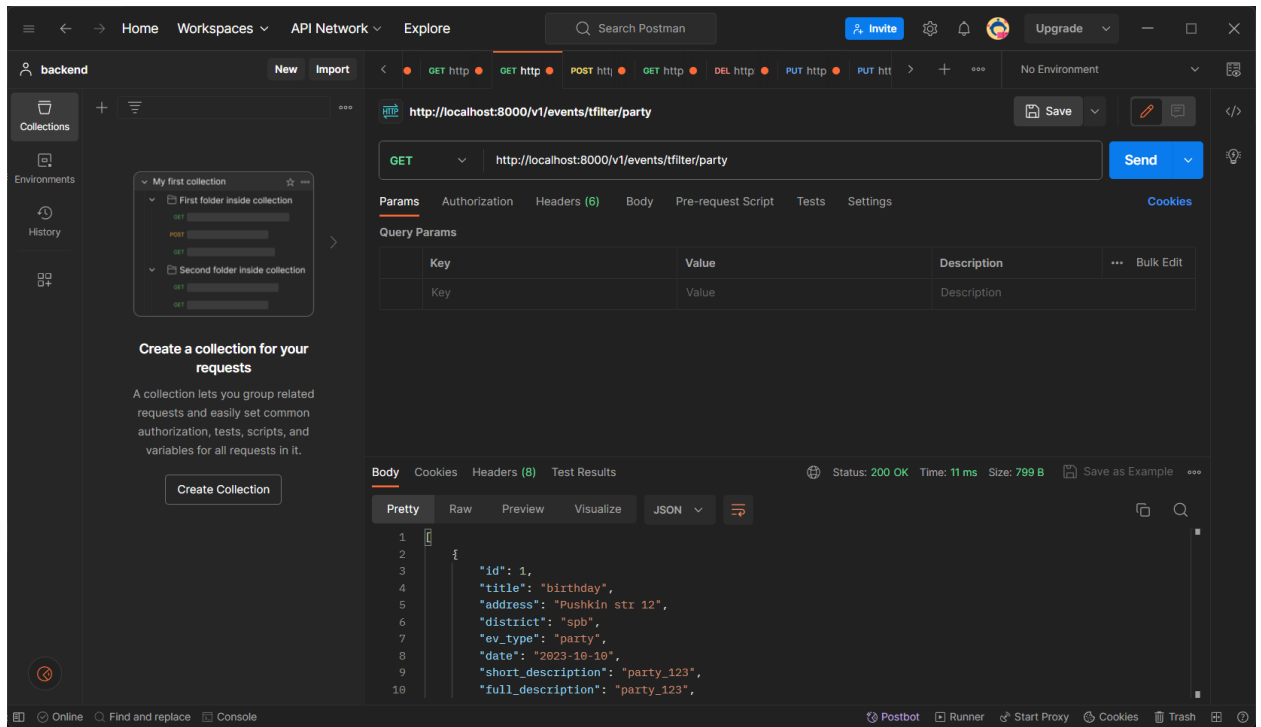
Мероприятия пользователя:



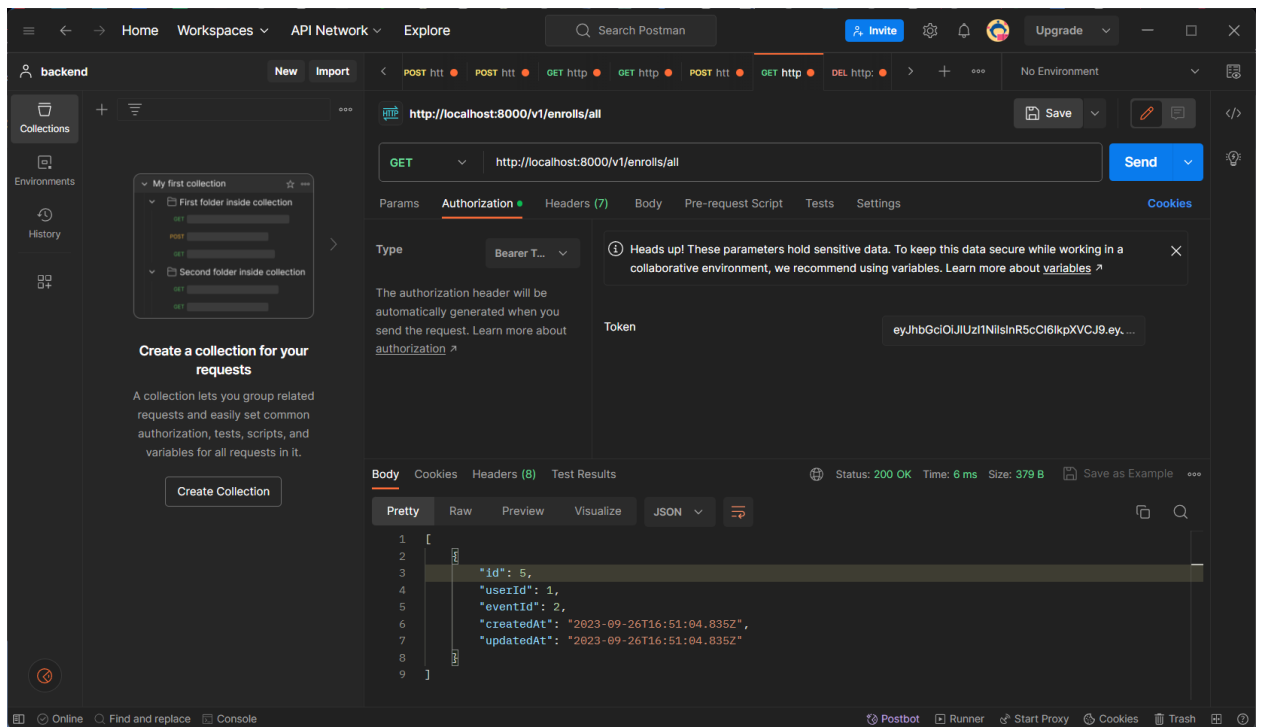
Фильтрация по району:



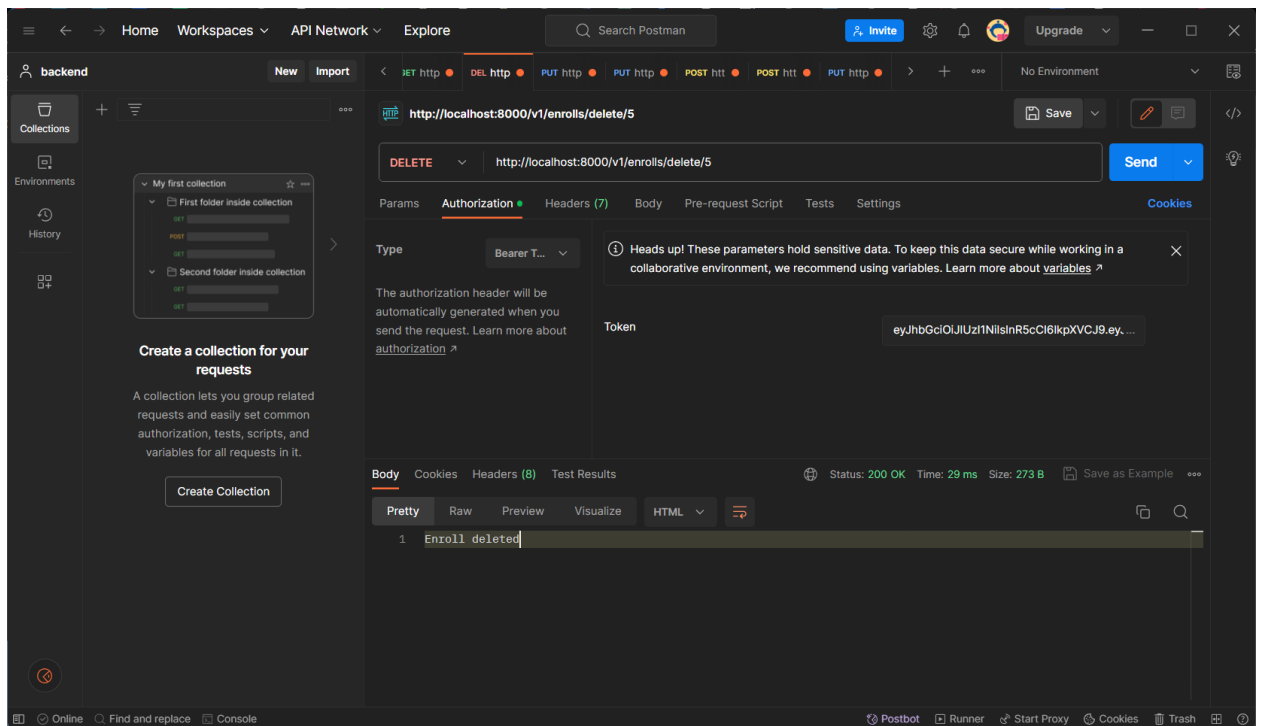
Фильтрация по типу мероприятия:



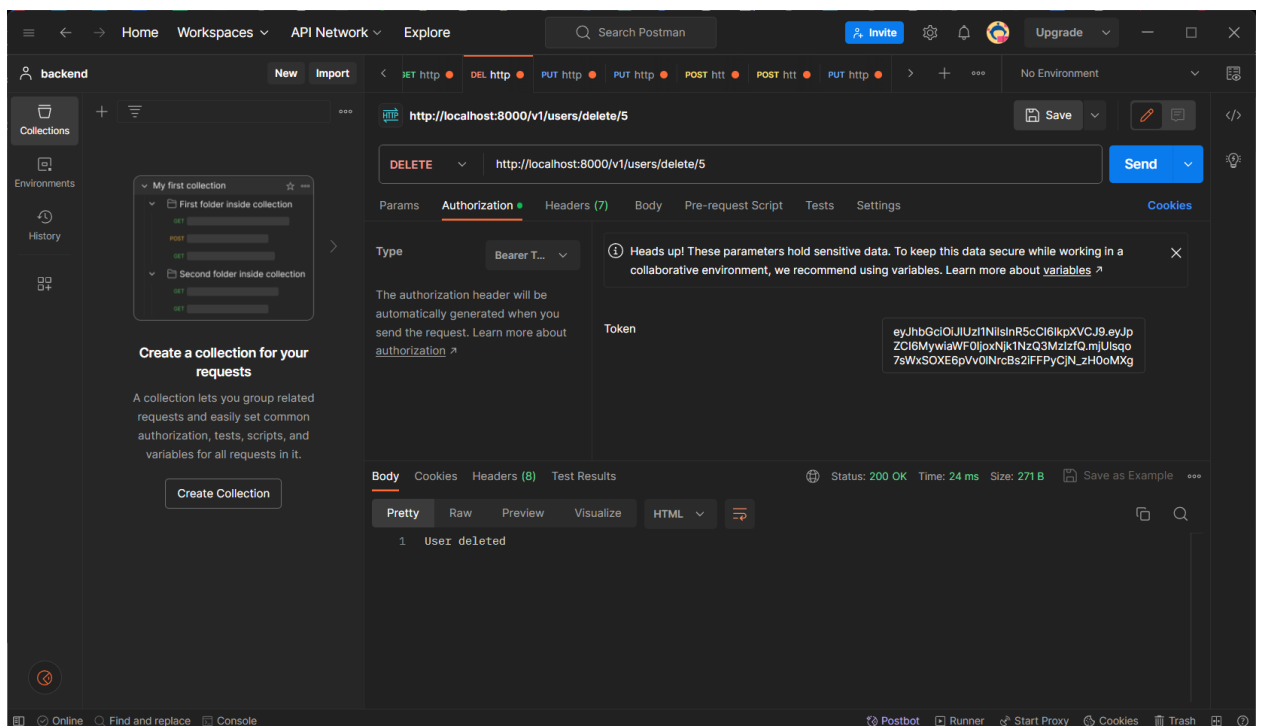
Все записи:



Удаление записи пользователя:



Удаление пользователя:



Вывод

Перефразируй:

В ходе лабораторной работы был разработан RESTful API с использованием express и TypeScript, на основе предварительно созданного шаблона, с целью осуществления поиска мероприятий, проводящихся в Санкт-Петербурге.