

Міністерство освіти і науки України
Харківський національний університет радіоелектроніки

Кафедра Інформатики

Звіт з лабораторної роботи № 1
з дисципліни: «Обмін даними у Web-застосунках»
по темі: «REST API»

Виконала:

ст. гр. ІТІНФ-21-2

Краснянська В. В.

Перевірив:

Шелест В.А.

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1 РЕАЛІЗАЦІЯ REST API КОМУНІКАЦІЇ

1.1 Мета роботи: Вивчення взаємодії клієнта з сервером за допомогою архітектурного стилю REST API

1.2 Завдання для самостійної роботи

1. Реалізувати сервер, який буде приймати REST HTTP запити - усі базові типи запитів: POST, PUT, GET, DELETE
2. Реалізувати клієнт, який буде надсилати запити на сервер. Клієнт має мати “зручний” інтерфейс

GitHub: <https://github.com/kras2v/ODUW>

Хід роботи

На початковому етапі було створено контролер та модель, щоб забезпечити структуру для обробки HTTP-запитів і управління даними.

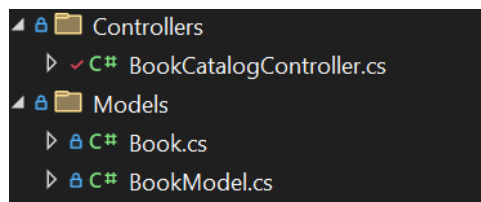


Рисунок 1 – Створення controller и model

Обробка запитів у контролері:

```
[HttpPost]
0 references
public IActionResult CreateBook([FromBody]BookModel bookToCreate)
{
    try
    {
        if (bookToCreate == null)
            return BadRequest();

        bookToCreate.id = books.Last().Id + 1;
        var book = new Book();
        book.Id = bookToCreate.id;
        book.Title = bookToCreate.title;
        book.Description = bookToCreate.description;
        book.Author = bookToCreate.author;
        book.Genre = bookToCreate.genre;
        book.Year = bookToCreate.year;
        book.Price = bookToCreate.price;
        books.Add(book);

        return CreatedAtAction(nameof(GetBook), new { id = book.Id }, book);
    }
    catch (Exception ex)
    {
        return BadRequest(ex.Message);
    }
}
```

Рисунок 2 – Create приймає дані від клієнта та ініціює створення нової сутності в базі даних.

```

[HttpGet]
0 references
public IActionResult GetAllBooks()
{
    return Ok(books);
}

[HttpGet("{id}")]
1 reference
public IActionResult GetBook(int id)
{
    var res = books.FirstOrDefault(book => book.Id == id);
    if (res == null)
        return BadRequest();

    return Ok(res);
}

```

Рисунок 3 — Get обробляє запити для отримання даних, повертаючи потрібну інформацію клієнту.

```

[HttpPut]
0 references
public IActionResult UpdateBook([FromBody]BookModel bookToUpdate)
{
    var book = books.FirstOrDefault(book => book.Id == bookToUpdate.id);
    if (book == null)
        return BadRequest($"Cannot find book with id {bookToUpdate.id}");

    book.Title = bookToUpdate.title;
    book.Author = bookToUpdate.author;
    book.Genre = bookToUpdate.genre;
    book.Description = bookToUpdate.description;
    if (bookToUpdate.year < 0 || bookToUpdate.year > DateTime.Today.Year)
        return BadRequest($"Wrong values");
    book.Year = bookToUpdate.year;
    if (bookToUpdate.price < 0)
        return BadRequest($"Wrong values");
    book.Price = bookToUpdate.price;

    return Ok(bookToUpdate);
}

```

Рисунок 4 — Update (Put) приймає запити на зміну існуючих даних, забезпечуючи їх актуальність.

```

[HttpDelete("{id}")]
0 references
public IActionResult DeleteBook(int id)
{
    var book = books.Find(x => x.Id == id);
    if (book == null)
        return BadRequest(404);

    books.Remove(book);
    return Ok();
}

```

Рисунок 5 — Delete обробляє запити на видалення записів, вилучаючи непотрібні дані з бази.

```

8 references
public class Book
{
    11 references
    public int Id { get; set; }
    7 references
    public string Title { get; set; }
    7 references
    public string Description { get; set; }
    7 references
    public string Author { get; set; }
    7 references
    public int Year { get; set; }
    7 references
    public string Genre { get; set; }
    7 references
    public decimal Price { get; set; }
}

```

Рисунок 6 – Model книги

Далі можна перейти до розробки клієнта:

```

async function getData(id) {
    const url = `http://localhost:5192/${id}`;
    try {
        const response = await fetch(url);
        if (!response.ok) {
            let error_msg = document.querySelector(".no-book");
            error_msg.innerText = "No book was found";
            throw new Error(`Response status: ${response.status}`);
        }
        const json = await response.json();
        return json;
    } catch (error) {
        console.error(error.message);
    }
}

```

Рисунок 7 – Get by id client

```

window.addEventListener("load", (event) => {
    async function getData() {
        const url = "http://localhost:5192/";
        try {
            const response = await fetch(url);
            if (!response.ok) {
                throw new Error(`Response status: ${response.status}`);
            }
            console.log(response);
            const json = await response.json();
            return json;
        } catch (error) {
            console.error(error.message);
        }
    }
}
)

```

Рисунок 8 – Get all client

```

async function saveData(data) {
  const url = `http://localhost:5192/BookCatalog/CreateBook`;
  try {
    const response = await fetch(url, {
      method: 'POST',
      headers: {
        'Content-type': 'application/json; charset=UTF-8'
      },
      body: JSON.stringify(data)
    });

    if (!response.ok) {
      throw new Error(`Response status: ${response.status}`);
    }

    const json = await response.json();
    console.log("Book saved:", json);
  } catch (error) {
    console.error(error.message);
  }
}

```

Рисунок 9 – POST client

```

async function deleteData(id) {
  const url = `http://localhost:5192/${id}`;
  try {
    const response = await fetch(url, { method: 'DELETE' });
    if (!response.ok) {
      throw new Error(`Response status: ${response.status}`);
    }
  }
  catch (error) {
    console.error(error.message);
    alert("Error deleting book: " + error.message);
  }
}

```

Рисунок 10 – DELETE client

```

async function updateData(id, data) {
  const url = `http://localhost:5192/BookCatalog/UpdateBook`;
  try {
    const response = await fetch(url, {
      method: 'PUT',
      headers: {
        'Content-type': 'application/json; charset=UTF-8'
      },
      body: JSON.stringify(data)
    });
    if (!response.ok) {
      throw new Error(`Response status: ${response.status}`);
    }
    const json = await response.json();
    return json;
  } catch (error) {
    console.error(error.message);
    alert("Error updating book: " + error.message);
  }
}

```

Рисунок 11 – PUT client

Замість створення БД я вирішила зробити простий ліст, що буде зберігатися на сервері.

```

private readonly static List<Book> books = new List<Book>()
{
  new Book()
  {
    Id = 1,
    Title = "To Kill a Mockingbird",
    Author = "Harper Lee",
    Year = 1960,
    Genre = "Fiction",
    Price = 7.99m,
    Description = "A novel about the serious issues of race and class in the Deep South, seen through the eyes of a young girl."
  },
  new Book()
  {
    Id = 2,
    Title = "1984",
    Author = "George Orwell",
    Year = 1949,
    Genre = "Dystopian",
    Price = 8.99m,
    Description = "A chilling tale about totalitarianism and surveillance in a dystopian future."
  },
  new Book()
  {
    Id = 3,
    Title = "The Great Gatsby",
    Author = "F. Scott Fitzgerald",
    Year = 1925,
    Genre = "Classic",
    Price = 10.50m,
    Description = "A story about the American dream and the excesses of the Jazz Age, narrated by Nick Carraway."
  },
  new Book()
  {
    Id = 4,
    Title = "Pride and Prejudice",
    Author = "Jane Austen",
    Year = 1813,
    Genre = "Romance",
    Price = 6.99m,
    Description = "A romantic novel that deals with issues of class, marriage, and morality in early 19th-century England."
  },
  new Book()
  {
    Id = 5,
    Title = "The Catcher in the Rye",
    Author = "J.D. Salinger",
    Year = 1951,
    Genre = "Fiction",
    Price = 9.99m,
    Description = "A coming-of-age story that explores themes of identity, belonging, and alienation."
  }
}

```

Рисунок 12 – PUT client

Book catalog

| Title | Description | Author | Year | Genre | Price |
|------------------------|--|---------------------|------|-----------|-------|
| To Kill a Mockingbird | A novel about the serious issues of race and class in the Deep South, seen through the eyes of a young girl. | Harper Lee | 1960 | Fiction | 7.99 |
| 1984 | A chilling tale about totalitarianism and surveillance in a dystopian future. | George Orwell | 1949 | Dystopian | 8.99 |
| The Great Gatsby | A story about the American dream and the excesses of the Jazz Age, narrated by Nick Carraway. | F. Scott Fitzgerald | 1925 | Classic | 10.5 |
| Pride and Prejudice | A romantic novel that deals with issues of class, marriage, and morality in early 19th-century England. | Jane Austen | 1813 | Romance | 6.99 |
| The Catcher in the Rye | A coming-of-age story that explores themes of identity, belonging, and alienation. | J.D. Salinger | 1951 | Fiction | 9.99 |

Create

Рисунок 12 – Get all

Create Book

Title

The brave new world

Description

Brave New World is a dystopian novel by English author Aldous Huxley, written in 1931 and published in 1932.

Author

Aldous Huxley

Year

1931

Genre

Science Fiction

Price

30

Save

Return to Book Catalog

Рисунок 13 – Create new book

Create Book

Title

The brave new world



Description

Brave New World is a dystopian novel by English author Aldous Huxley, written in 1931 and published in 1932.



Author

Aldous Huxley



Year

1931



Genre

Science Fiction



Price

30



Save

Return to Book Catalog

Рисунок 14 – Success creation of the book

Book catalog

| Title | Description | Author | Year | Genre | Price |
|------------------------|--|---------------------|------|-----------------|-------|
| To Kill a Mockingbird | A novel about the serious issues of race and class in the Deep South, seen through the eyes of a young girl. | Harper Lee | 1960 | Fiction | 7.99 |
| 1984 | A chilling tale about totalitarianism and surveillance in a dystopian future. | George Orwell | 1949 | Dystopian | 8.99 |
| The Great Gatsby | A story about the American dream and the excesses of the Jazz Age, narrated by Nick Carraway. | F. Scott Fitzgerald | 1925 | Classic | 10.5 |
| Pride and Prejudice | A romantic novel that deals with issues of class, marriage, and morality in early 19th-century England. | Jane Austen | 1813 | Romance | 6.99 |
| The Catcher in the Rye | A coming-of-age story that explores themes of identity, belonging, and alienation. | J.D. Salinger | 1951 | Fiction | 9.99 |
| The brave new world | Brave New World is a dystopian novel by English author Aldous Huxley, written in 1931 and published in 1932. | Aldous Huxley | 1931 | Science Fiction | 30 |

Create

Рисунок 15 – Updated list

Create Book

The Catcher in the Rye

A coming-of-age story that explores themes of identity, belonging, and alie

J.D. Salinger

1951

Fiction

9.99

Delete

Save

[Return to Book Catalog](#)

Рисунок 16 – Update book

| | | | | | |
|--|---|---------------|------|---------|------|
| The Catcher in the Rye | The Catcher in the Rye is a novel by American author J. D. Salinger that was partially published in serial form in 1945–46 before being novelized in 1951 | J.D. Salinger | 1900 | Fiction | 9.99 |
|--|---|---------------|------|---------|------|

Рисунок 17 – New description and year

This page says

Are you sure you want to delete this book?

OK

Cancel

The Catcher in the Rye

The Catcher in the Rye is a novel by American author J. D. Salinger that was

J.D. Salinger

1900

Fiction

9.99

Delete

Save

[Return to Book Catalog](#)

Рисунок 17 – Delete

Create Book

No book was found

Delete

Save

Return to Book Catalog

Рисунок 17 – Deleted book

Book catalog

| Title | Description | Author | Year | Genre | Price |
|---------------------------------------|--|---------------------|------|-----------------|-------|
| To Kill a Mockingbird | A novel about the serious issues of race and class in the Deep South, seen through the eyes of a young girl. | Harper Lee | 1960 | Fiction | 7.99 |
| 1984 | A chilling tale about totalitarianism and surveillance in a dystopian future. | George Orwell | 1949 | Dystopian | 8.99 |
| The Great Gatsby | A story about the American dream and the excesses of the Jazz Age, narrated by Nick Carraway. | F. Scott Fitzgerald | 1925 | Classic | 10.5 |
| Pride and Prejudice | A romantic novel that deals with issues of class, marriage, and morality in early 19th-century England. | Jane Austen | 1813 | Romance | 6.99 |
| The brave new world | Brave New World is a dystopian novel by English author Aldous Huxley, written in 1931 and published in 1932. | Aldous Huxley | 1931 | Science Fiction | 30 |

Create

Рисунок 17 – Updated list

Висновок: виконавши лабораторну роботу, я опанував базові навички написання клієнту та серверу на серверній архітектурі REST API.