

Институт компьютерных наук (ИKN)

Кафедра Инфокоммуникационных технологий (ИКТ)

Отчет по лабораторной работе №5
по дисциплине «Разработка сетевых приложений
на языке программирования Python»
на тему «Введение в Python»

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Архитектура сервера:

▼ lab5	●
≡ calculator.db	U
🔧 main.py	2, U

Импортированные библиотеки

```
1 import sqlite3
2 from datetime import datetime
3 from fastapi import FastAPI
```

Инициализация базы данных

```
8 def init_db():
9     conn = sqlite3.connect('calculator.db')
10    cursor = conn.cursor()
11
12    cursor.execute('''
13    CREATE TABLE IF NOT EXISTS calculations (
14        id INTEGER PRIMARY KEY AUTOINCREMENT,
15        timestamp TEXT NOT NULL,
16        operation TEXT NOT NULL,
17        num1 REAL NOT NULL,
18        num2 REAL NOT NULL,
19        result TEXT NOT NULL,
20        status TEXT NOT NULL
21    )
22    ''')
23
24    conn.commit()
25    conn.close()
```

Обработчик запроса calculate

```
44 operations = {
45     '+': lambda x, y: x + y,
46     '-': lambda x, y: x - y,
47     '*': lambda x, y: x * y,
48     '/': lambda x, y: x / y if y != 0 else "Деление на ноль!"
49 }
50
51 @app.get('/calculate/{operation}')
52 def calculate(operation: str, num1: int, num2: int):
53     if operation not in operations:
54         result = "Неизвестная операция"
55         status = "error"
56     else:
57         try:
58             result = operations[operation](num1, num2)
59             status = "success" if not isinstance(result, str) else "error"
60         except Exception as e:
61             result = str(e)
62             status = "error"
63
64     log_operation(operation, num1, num2, result, status)
65
66     return {
67         f"{num1} {operation} {num2}": result,
68         "status": status
69     }
```

Обработчик запроса на получение логов приложения

```
28 def log_operation(operation: str, num1: float, num2: float, result: str,
29 status: str):
30     conn = sqlite3.connect('calculator.db')
31     cursor = conn.cursor()
32
33     timestamp = datetime.now().strftime("%Y-%m-%d %H:%M:%S")
34
35     cursor.execute('''
36     INSERT INTO calculations (timestamp, operation, num1, num2, result, status)
37     VALUES (?, ?, ?, ?, ?, ?)
38     ''', (timestamp, operation, num1, num2, str(result), status))
39
40     conn.commit()
41     conn.close()
```

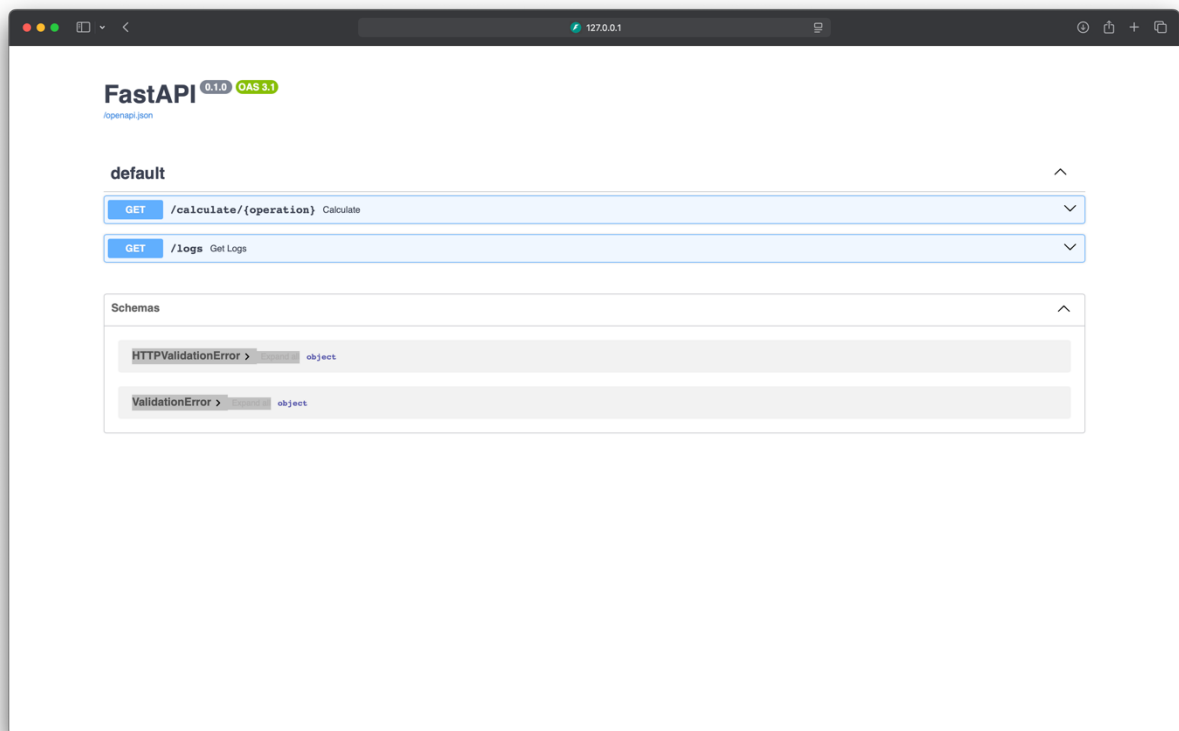
Запуск приложения

```
100 if __name__ == "__main__":
101     import uvicorn
102     uvicorn.run("main:app", host="127.0.0.1", port=5453)
```

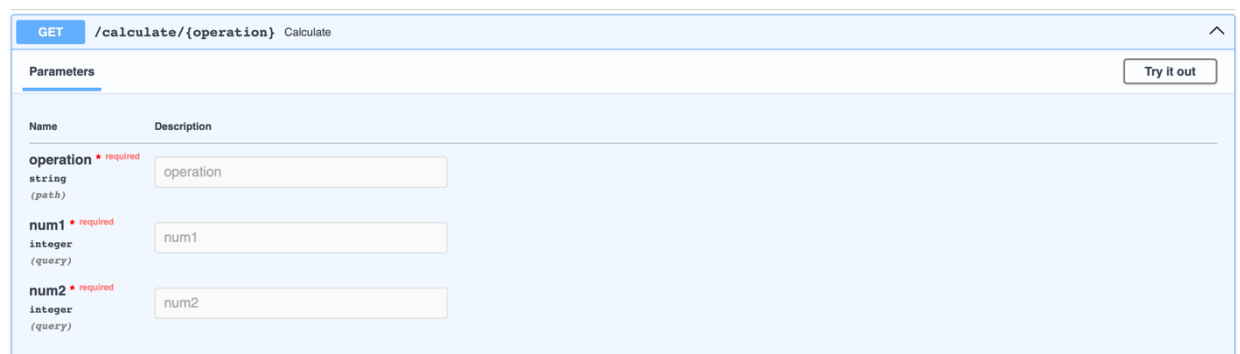
Логи работы приложения в консоли

```
○ (venv) dmitrijsterligov@MacBook-Air-Dmitrij lab5 % python3 main.py
INFO: Started server process [98175]
INFO: Waiting for application startup.
INFO: Application startup complete.
INFO: Uvicorn running on http://127.0.0.1:5453 (Press CTRL+C to quit)
INFO: 127.0.0.1:55938 - "GET /docs HTTP/1.1" 200 OK
INFO: 127.0.0.1:55938 - "GET /openapi.json HTTP/1.1" 200 OK
INFO: 127.0.0.1:55953 - "GET /calculate/%2B?num1=11&num2=37 HTTP/1.1" 200 OK
INFO: 127.0.0.1:55961 - "GET /calculate/%2B?num1=11&num2=37 HTTP/1.1" 200 OK
INFO: 127.0.0.1:55961 - "GET /calculate/%2B?num1=11&num2=37 HTTP/1.1" 200 OK
INFO: 127.0.0.1:55961 - "GET /calculate/%2B?num1=11&num2=37 HTTP/1.1" 200 OK
INFO: 127.0.0.1:55961 - "GET /calculate/%2B?num1=11&num2=37 HTTP/1.1" 200 OK
INFO: 127.0.0.1:55961 - "GET /calculate/%2B?num1=11&num2=37 HTTP/1.1" 200 OK
INFO: 127.0.0.1:55969 - "GET /logs?limit=10 HTTP/1.1" 200 OK
```

Swagger



Endpoint для calculate



Работа calculate

GET

/calculate/{operation} Calculate

⌵

Parameters

Cancel

Name	Description
operation * required string (path)	<div>+</div>
num1 * required integer (query)	<div>11</div>
num2 * required integer (query)	<div>37</div>

Execute

Clear

Responses

Curl

curl -X 'GET' \ 'http://127.0.0.1:5453/calculate/%2B?num1=11&num2=37' \ -H 'accept: application/json'

Request URL

http://127.0.0.1:5453/calculate/%2B?num1=11&num2=37

Server response

Code	Details
200	<div><div>Response body</div><div><pre>{ "11 + 37": 48, "status": "success" }</pre></div><div><div>Download</div></div></div>

Endpoint для logs

GET

/logs Get Logs

⌵

Parameters

Try it out

Name	Description
limit integer (query)	<div>Default value : 10</div> <div>10</div>

Responses

Curl

curl -X 'GET' \ 'http://127.0.0.1:5453/logs?limit=10' \ -H 'accept: application/json'

Request URL

http://127.0.0.1:5453/logs?limit=10

Server response

Работа logs

Code

Details

200

Response body

```
{
  "logs": [
    {
      "timestamp": "2025-04-10 00:04:31",
      "operation": "+",
      "num1": 11,
      "num2": 37,
      "result": 48,
      "status": "success"
    },
    {
      "timestamp": "2025-04-10 00:04:29",
      "operation": "+",
      "num1": 11,
      "num2": 37,
      "result": 48,
      "status": "success"
    },
    {
      "timestamp": "2025-04-10 00:04:28",
      "operation": "+",
      "num1": 11,
      "num2": 37,
      "result": 48,
      "status": "success"
    }
  ]
}
```

Download

