

# ASSIGNMENT-15.1

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BATCH:15

SUBJECT:AI CODING

## TASK-1

### QUESTION:

1 – Student Records API

Task:

Use AI to build a RESTful API for managing student records.

Instructions:

- Endpoints required:
  - o GET /students → List all students
  - o POST /students → Add a new student
  - o PUT /students/{id} → Update student details
  - o DELETE /students/{id} → Delete a student record
- Use an in-memory data structure (list or dictionary) to store records.
- Ensure API responses are in JSON format.

Expected Output:

- Working API with CRUD functionality for student records

### PROMPT:

Create a simple python FastAPI CRUD API for student records using an in-memory list. Include endpoints for Get, Post, Put, Delete, and return json responses.

## CODE:

```
lab15_student_api.py > ...
1 # lab15_student_api.py
2 from fastapi import FastAPI, HTTPException
3 from pydantic import BaseModel
4 from typing import List
5
6 # Initialize the FastAPI app
7 app = FastAPI(
8     title="Student Records API",
9     description="A simple RESTful API for managing student records.",
10    version="1.0.0"
11)
12
13 # ----- Data Models -----
14 class Student(BaseModel):
15     id: int
16     name: str
17     age: int
18     major: str
19
20 # In-memory database (dictionary)
21 students_db = {}
22
23 # ----- API Endpoints -----
24
25 @app.get("/students", response_model=List[Student])
26 def get_students():
27     """
28     Get a list of all students.
29     """
30     return list(students_db.values())
31
32
33 @app.post("/students", response_model=Student)
34 def create_student(student: Student):
35     """
36     Add a new student to the database.
37     """
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```

Get:

Curl

```
curl -X 'GET' \
  'http://127.0.0.1:8000/students' \
  -H 'accept: application/json'
```

Request URL

```
http://127.0.0.1:8000/students
```

Server response

Code

Details

200

Response body

```
{
  "id": 2,
  "name": "ash",
  "age": 20,
  "major": "cse"
},
{
  "id": 1,
  "name": "ash",
  "age": 20,
  "major": "yes"
}
```

Response headers

```
content-length: 91
content-type: application/json
date: Mon, 27 Oct 2025 04:40:34 GMT
server: uvicorn
```

Responses

Code

Description

Links

200

Successful Response

No links

Put:

Curl

```
curl -X 'PUT' \
  'http://127.0.0.1:8000/students/2' \
  -H 'accept: application/json' \
  -H 'Content-Type: application/json' \
  -d '{
    "id": 0,
    "name": "ram",
    "age": 0,
    "major": "string"
  }'
```

Request URL

```
http://127.0.0.1:8000/students/2
```

Server response

Code

Details

200

Response body

```
{
  "id": 0,
  "name": "ram",
  "age": 0,
  "major": "string"
}
```

Response headers

```
content-length: 46
content-type: application/json
date: Mon, 27 Oct 2025 04:41:18 GMT
server: uvicorn
```

Responses

Code

Description

Links

200

Successful Response

No links

Delete:

Curl

```
curl -X 'DELETE' \
  'http://127.0.0.1:8000/students/2' \
  -H 'accept: application/json'
```

Request URL

```
http://127.0.0.1:8000/students/2
```

Server response

Code

Details

200

Response body

```
{
  "message": "Student with ID 2 deleted successfully."
}
```

Response headers

```
content-length: 53
content-type: application/json
date: Mon, 27 Oct 2025 04:41:57 GMT
server: uvicorn
```

Responses

Code

Description

Links

200

Successful Response

No links

**OBSERVATION:**

The student records api successfully demonstrates basic crud operations using fastapi. it allows users to add, view, update, and delete student details through simple endpoints. the use of an in-memory list makes the implementation easy to understand and ideal for beginners learning restful apis. the api responses are returned in json format, ensuring clear and structured communication between the client and server. overall, it effectively shows how to manage data in a clean and user-friendly way.

**TASK-2****QUESTION:**

2 – Library Book Management API

Task:

Develop a RESTful API to handle library books.

Instructions:

- Endpoints required:
  - o GET /books → Retrieve all books
  - o POST /books → Add a new book
  - o GET /books/{id} → Get details of a specific book
  - o PATCH /books/{id} → Update partial book details (e.g., availability)
  - o DELETE /books/{id} → Remove a book
- Implement error handling for invalid requests.

Expected Output:

- Functional API with CRUD + partial updates

**PROMPT:**

Create a fastapi based restful api for library book management using an in memory list. include endpoints for get, post, get by id, patch, and delete. handle invalid requests with proper error messages and return all responses in json format

## CODE:

```
lab15_library_api.py > ...
1  # lab15_library_api.py
2  from fastapi import FastAPI, HTTPException
3  from pydantic import BaseModel
4  from typing import Optional, Dict
5
6  app = FastAPI(
7      title="Library Book Management API",
8      description="RESTful API to manage library books with CRUD and partial update",
9      version="1.0.0"
10 )
11
12 # ----- Data Models -----
13 class Book(BaseModel):
14     id: int
15     title: str
16     author: str
17     year: int
18     available: bool = True
19
20 class BookUpdate(BaseModel):
21     title: Optional[str] = None
22     author: Optional[str] = None
23     year: Optional[int] = None
24     available: Optional[bool] = None
25
26 # In-memory "database"
27 books_db: Dict[int, Book] = {}
28
29 # ----- Endpoints -----
30
31 @app.get("/books")
32 def get_books():
33     """
34     Retrieve all books in the library.
35     """
36     return list(books_db.values())
37
```

## OUTPUT:

```
PROBLEMS  OUTPUT  TERMINAL  ...  > uvicorn + v [icon] [icon] ... [icon] x
PS D:\BTECH\AI Assisted Coding\LABS ASSIGNMENTS\Lab 15> uvicorn lab15_library_api:app --reload
>>
INFO: Will watch for changes in these directories: ['D:\\BTECH\\AI Assisted Coding\\LABS ASSIGNMENTS\\Lab 15']
INFO: Uvicorn running on http://127.0.0.1:8000 (Press CTRL+C to quit)
INFO: Started reloader process [10024] using StatReload
INFO: Started server process [17752]
INFO: Waiting for application startup.
INFO: Application startup complete.
INFO: 127.0.0.1:53788 - "GET /docs HTTP/1.1" 200 OK
INFO: 127.0.0.1:53788 - "GET /openapi.json HTTP/1.1" 200 OK
INFO: 127.0.0.1:49944 - "POST /books HTTP/1.1" 200 OK
[icon]
```

Post:

```
-d '{
  "id": 1,
  "title": "Java",
  "author": "Ramu",
  "year": 2025,
  "available": true
}'
```

Request URL

http://127.0.0.1:8080/books

Server response

Code	Details
200	<div>Response body</div> <div><pre>{   "id": 1,   "title": "Java",   "author": "Ramu",   "year": 2025,   "available": true }</pre></div> <div>Response headers</div> <div><pre>content-length: 68 content-type: application/json date: Mon, 27 Oct 2025 04:46:19 GMT server: uvicorn</pre></div>

Responses

Code	Description	Links
200	Successful Response	No links

Media type

application/json

Controls Accept header.

Get:

Request URL

http://127.0.0.1:8080/books

Server response

Code	Details
200	<div>Response body</div> <div><pre>{   "id": 1,   "title": "Java",   "author": "Ramu",   "year": 2025,   "available": true }</pre></div> <div>Response headers</div> <div><pre>content-length: 70 content-type: application/json date: Mon, 27 Oct 2025 04:51:58 GMT server: uvicorn</pre></div>

Responses

Code	Description	Links
200	Successful Response	No links

Media type

application/json

Controls Accept header.

Example Value | Schema

"string"

Put:

```
-H 'accept: application/json' \
-H 'Content-Type: application/json' \
-d '{
  "title": "string",
  "author": "string",
  "year": 2025,
  "available": true
}'
```

Request URL

http://127.0.0.1:8080/books/1

Server response

Code	Details
200	<div>Response body</div> <div><pre>{   "id": 1,   "title": "string",   "author": "string",   "year": 2025,   "available": true }</pre></div> <div>Response headers</div> <div><pre>content-length: 72 content-type: application/json date: Mon, 27 Oct 2025 04:53:28 GMT server: uvicorn</pre></div>

Responses

Code	Description	Links
200	Successful Response	No links

Media type

application/json

Controls Accept header.

## Delete:

Curl

```
curl -X 'DELETE' \
  'http://127.0.0.1:8000/books/1' \
  -H 'accept: application/json'
```

Request URL

http://127.0.0.1:8000/books/1

Server response

Code	Details
200	<p>Response body</p> <pre>{   "message": "Book with ID 1 deleted successfully." }</pre> <p>Response headers</p> <pre>content-length: 50 content-type: application/json date: Mon, 27 Oct 2025 04:53:48 GMT server: unicorn</pre>

Responses

Code	Description	Links
200	Successful Response	No links

Media type:

Controls: Accept header

## OBSERVATION:

The library book management api efficiently handles basic operations like adding, viewing, updating, and deleting book records. it also supports partial updates using the patch method, making it flexible for managing book availability. error handling ensures smooth functioning even with invalid inputs. overall, it provides a simple and effective way to manage library data using restful principles.

## TASK-3

### QUESTION:

#### 3 – Employee Payroll API

Task:

Create an API for managing employees and their salaries.

Instructions:

- Endpoints required:
  - o GET /employees → List all employees
  - o POST /employees → Add a new employee with salary

details

- o PUT /employees/{id}/salary → Update salary of an employee
- o DELETE /employees/{id} → Remove employee from system

- Use AI to:

- o Suggest data model structure.
- o Add comments/docstrings for all endpoints.

Expected Output:

- API supporting salary management with clear documentation.

## PROMPT:

Create a python fastapi restful api for employee payroll management using an in memory list. include endpoints for get, post, put and delete employees. use ai to suggest a data model structure and add clear comments or docstrings for each endpoint. return responses in json format.

## CODE:

```
lab15_employee_api.py 1 @ delete_employee
1 # lab15_employee_api.py
2 from fastapi import FastAPI, HTTPException
3 from pydantic import BaseModel, Field
4 from typing import Dict
5
6 app = FastAPI(
7     title="Employee Payroll API",
8     description="RESTful API to manage employees and their salaries.",
9     version="1.0.0"
10 )
11
12 # ----- AI-Suggested Data Model -----
13 class Employee(BaseModel):
14     """
15     Represents an employee record with basic details and salary information.
16     """
17     id: int = Field(..., description="Unique employee ID")
18     name: str = Field(..., description="Full name of the employee")
19     department: str = Field(..., description="Department where the employee works")
20     position: str = Field(..., description="Job title or role")
21     salary: float = Field(..., description="Monthly salary of the employee")
22
23 class SalaryUpdate(BaseModel):
24     """
25     Represents the salary update structure for an existing employee.
26     """
27     salary: float = Field(..., description="Updated salary value")
28
29 # In-memory "database"
30 employees_db: Dict[int, Employee] = {}
31
32 # ----- API Endpoints -----
33
34 @app.get("/employees")
35 def list_employees():
36     """
```

## OUTPUT:

```
PS D:\BTECH\AI Assisted Coding\LABS ASSIGNMENTS\Lab 15> uvicorn lab15_employee_api:app --reload
>>
INFO:     Will watch for changes in these directories: ['D:\\BTECH\\AI Assisted Coding\\LABS ASSIGNMENTS\\Lab 15']
INFO:     Uvicorn running on http://127.0.0.1:8000 (Press CTRL+C to quit)
INFO:     Started reloader process [12212] using StatReload
INFO:     Started server process [11044]
INFO:     Waiting for application startup.
INFO:     Application startup complete.
INFO:     127.0.0.1:51656 - "GET /docs HTTP/1.1" 200 OK
INFO:     127.0.0.1:51656 - "GET /openapi.json HTTP/1.1" 200 OK
█
```



Post:

```
{
  "department": "cse",
  "position": "Dev",
  "salary": 90000
}
```

Request URL

http://127.0.0.1:8000/employees

Server response

Code	Details
200	<div>Response body</div> <div><pre>{   "id": 1,   "name": "kiran",   "department": "cse",   "position": "Dev",   "salary": 90000 }</pre></div> <div>Response headers</div> <div><pre>content-length: 76 content-type: application/json date: Mon, 27 Oct 2025 04:59:58 GMT server: uvicorn</pre></div>

Responses

Code	Description	Links
200	Successful Response	No links

Media type

application/json

Controls Accept header.

Example Value | Schema

Get:

```
curl -X 'GET' \
  'http://127.0.0.1:8000/employees' \
  -H 'accept: application/json'
```

Request URL

http://127.0.0.1:8000/employees

Server response

Code	Details
200	<div>Response body</div> <div><pre>{   "id": 1,   "name": "kiran",   "department": "cse",   "position": "Dev",   "salary": 90000 }</pre></div> <div>Response headers</div> <div><pre>content-length: 78 content-type: application/json date: Mon, 27 Oct 2025 05:00:44 GMT server: uvicorn</pre></div>

Responses

Code	Description	Links
200	Successful Response	No links

Media type

Put:

```
{
  "salary": 110000
}
```

Request URL

http://127.0.0.1:8000/employees/1/salary

Server response

Code	Details
200	<div>Response body</div> <div><pre>{   "id": 1,   "name": "kiran",   "department": "cse",   "position": "Dev",   "salary": 110000 }</pre></div> <div>Response headers</div> <div><pre>content-length: 77 content-type: application/json date: Mon, 27 Oct 2025 05:01:15 GMT server: uvicorn</pre></div>

Responses

Code	Description	Links
200	Successful Response	No links

Media type

application/json

Controls Accept header.

Example Value | Schema

## Delete:

The screenshot displays a REST client interface with the following details:

- Responses** section:
- Curl**:

```
curl -X 'DELETE' \
'http://127.0.0.1:8000/employees/1' \
-H 'accept: application/json'
```
- Request URL**: `http://127.0.0.1:8000/employees/1`
- Server response**:
  - Code**: 200
  - Details**:
    - Response body**:

```
{
  "message": "Employee with ID 1 deleted successfully."
}
```
    - Response headers**:

```
content-length: 54
content-type: application/json
date: Mon, 27 Oct 2025 05:01:48 GMT
server: unicorn
```
- Responses** table:

Code	Description	Links
200	Successful Response	No links
- Media type**: `application/json`

## OBSERVATION:

The employee payroll api effectively manages employee details and salary information. it allows adding, viewing, updating, and deleting employee records with ease. ai-generated data model suggestions and docstrings make the code well-documented and beginner friendly. overall, it provides a clear and organized approach to handling payroll data through restful api design.

## TASK-4

### QUESTION:

#### 4 – Real-Time Application: Online Food Ordering API

##### Scenario:

Design a simple API for an online food ordering system.

##### Requirements:

- Endpoints required:
  - o GET /menu → List available dishes
  - o POST /order → Place a new order
  - o GET /order/{id} → Track order status
  - o PUT /order/{id} → Update an existing order (e.g., change items)
  - o DELETE /order/{id} → Cancel an order
- AI should generate:
  - o REST API code
  - o Suggested improvements (like authentication, pagination)

##### Expected Output:

- Fully working API simulating a food ordering backend

## PROMPT:

Create a python fastapi restful api for an online food ordering system using an in memory list. include endpoints for get menu, post order, get order by id, put to update order, and delete to cancel order. let ai suggest improvements like authentication and pagination. return all responses in json format.

## CODE:

```
lab15_food_api.py > ...
1 # lab15_food_api.py
2 from fastapi import FastAPI, HTTPException
3 from pydantic import BaseModel, Field
4 from typing import List, Dict, Optional
5
6 app = FastAPI(
7     title="Online Food Ordering API",
8     description="A RESTful API that simulates a basic online food ordering system",
9     version="1.0.0"
10 )
11
12 # ----- Data Models -----
13 class Dish(BaseModel):
14     """Represents a menu item (dish) available for order."""
15     id: int
16     name: str
17     price: float
18
19 class Order(BaseModel):
20     """Represents a customer's food order."""
21     id: int
22     items: List[int] = Field(..., description="List of dish IDs included in the order")
23     status: str = Field(default="Pending", description="Current status of the order")
24     total: float = 0.0
25
26 class OrderUpdate(BaseModel):
27     """Represents updates that can be applied to an existing order."""
28     items: Optional[List[int]] = None
29     status: Optional[str] = None
30
31 # ----- In-memory databases -----
32 menu_db: Dict[int, Dish] = {
33     1: Dish(id=1, name="Margherita Pizza", price=8.99),
34     2: Dish(id=2, name="Cheeseburger", price=7.49),
35     3: Dish(id=3, name="Pasta Alfredo", price=9.25),
36     4: Dish(id=4, name="Caesar Salad", price=5.75),
37 }
```

## OUTPUT:

```
PROBLEMS OUTPUT TERMINAL ...
PS D:\BTECH\AI Assisted Coding\LABS ASSIGNMENTS\Lab 15> uvicorn lab15_food_api:app --reload
>>
INFO: Will watch for changes in these directories: ['D:\\BTECH\\AI Assisted Coding\\LABS ASSIGNMENTS\\Lab 15']
INFO: Uvicorn running on http://127.0.0.1:8000 (Press CTRL+C to quit)
INFO: Started reloader process [3408] using StatReload
INFO: Started server process [12936]
INFO: Waiting for application startup.
INFO: Application startup complete.
INFO: 127.0.0.1:53575 - "GET /docs HTTP/1.1" 200 OK
INFO: 127.0.0.1:53575 - "GET /openapi.json HTTP/1.1" 200 OK
INFO: 127.0.0.1:63392 - "POST /order HTTP/1.1" 200 OK
```

Post:

Responses

Curl

```
curl -X 'POST' \
  'http://127.0.0.1:8000/order' \
  -H 'accept: application/json' \
  -H 'Content-Type: application/json' \
  -d '{
    "id": 2,
    "items": [
      1, 2
    ],
    "status": "Pending",
    "total": 18.24
  }'
```

Request URL

http://127.0.0.1:8000/order

Server response

Code

Details

200

Response body

```
{
  "id": 2,
  "items": [
    1, 2
  ],
  "status": "Pending",
  "total": 18.24
}
```

Response headers

```
content-length: 85
content-type: application/json
date: Mon, 27 Oct 2025 05:04:35 GMT
server: uvicorn
```

Get:

Responses

Curl

```
curl -X 'GET' \
  'http://127.0.0.1:8000/order/5' \
  -H 'accept: application/json'
```

Request URL

http://127.0.0.1:8000/order/5

Server response

Code

Details

200

Response body

```
{
  "id": 5,
  "items": [
    1
  ],
  "status": "Pending",
  "total": 8.99
}
```

Response headers

```
content-length: 52
content-type: application/json
date: Mon, 27 Oct 2025 05:12:31 GMT
server: uvicorn
```

Responses

Code	Description	Links
200	Successful Response	No links

Put:

Responses

Curl

```
curl -X 'PUT' \
  'http://127.0.0.1:8000/order/5' \
  -H 'accept: application/json' \
  -H 'Content-Type: application/json' \
  -d '{
    "items": [
      1
    ],
    "status": "Completed"
  }'
```

Request URL

http://127.0.0.1:8000/order/5

Server response

Code

Details

200

Response body

```
{
  "id": 5,
  "items": [
    1
  ],
  "status": "Completed",
  "total": 8.99
}
```

Response headers

```
content-length: 54
content-type: application/json
date: Mon, 27 Oct 2025 05:13:46 GMT
server: uvicorn
```

Responses

## Delete:

Responses

Curl

```
curl -X 'DELETE' \
'http://127.0.0.1:8000/order/5' \
-H 'accept: application/json'
```

Request URL

```
http://127.0.0.1:8000/order/5
```

Server response

Code	Details
200	<div><div>Response body</div><div><pre>{   "message": "Order 5 has been cancelled successfully." }</pre></div><div><div>Response headers</div><div><pre>content-length: 54 content-type: application/json date: Mon, 27 Oct 2025 05:14:10 GMT server: uvicorn</pre></div></div></div>

Responses

Code	Description	Links
200	Successful Response	No links

Media type

application/json

## OBSERVATION:

The online food ordering api successfully simulates a real-time backend system. it allows users to view the menu, place new orders, track order status, update orders, and cancel them easily. the api demonstrates clear structure and smooth functionality. ai-suggested features like authentication and pagination can further enhance security and performance. overall, it provides a practical example of how a modern food ordering system can be managed through restful api design.