Delivery App Simulator

Acknowledgement

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Project Guide

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Technology Stack: Java, Spring Boot, Maven, Rest APIs, Git

INTRODUCTION:

The **Delivery App Simulator** is a Spring Boot–based application designed to emulate the core functionality of a real-world delivery platform. It enables customers to place orders, track delivery status, and view order history while ensuring accurate order processing and delivery management.

The system leverages **RESTful APIs** for modular and scalable backend design, enabling easy integration with frontend applications or third-party services. For data persistence, it supports **MongoDB** or relational databases, storing detailed order and delivery information for quick retrieval and historical analysis.

For development workflow, the project uses **Git for version control**, allowing collaborative development, code tracking, and rollback if necessary. **Postman collections** are included for API testing, ensuring that endpoints function correctly and meet expected requirements.

OBJECTIVES:

Customer Order Management:

Enable customers to easily place, update, and cancel delivery orders through a user-friendly interface. The system ensures smooth order handling and efficient processing.

Real-Time Delivery Tracking:

Provide live updates on the status of deliveries(PENDING, IN_TRANSIT, DELIVERED) so that customers and administrators can monitor orders at any time.

Order and Delivery History:

Maintain a comprehensive history of all orders and deliveries, allowing users to review past transactions and track repeat orders.

Modular API Design with Spring Boot:

Use Spring Boot to build modular, scalable, and maintainable APIs. The architecture follows clean coding principles and ensures easy integration with other systems.

Development and Testing Support:

Leverage Git for version control and Postman collections for testing APIs. This ensures collaborative development, efficient debugging, and reliable deployment.

KEY FEATURES:

- **Order Management** – Place, update, cancel, and view orders.
- **Delivery Tracking** – Track delivery status in real time.
- **Item Management** – Add, update, and fetch delivery items with pricing.
- **Order History** – Retrieve complete order history for any customer.
- **Modular API Design** – Built with Spring Boot REST APIs following OOP principles.
- **Database Persistence** – Store and retrieve orders, deliveries, and items reliably.
- **Development Tools** – Uses Maven for build lifecycle, Git for version control, and Postman for testing.

TOOLS AND TECHNOLOGIES:

SpringBoot :

Used for building the RESTful backend API with modular, scalable architecture.

MongoDB / Relational Database:

Stores order, delivery, and user information with efficient retrieval and query support.

Postman:

For API testing and validation of endpoints, including GET, PUT, and POST requests.

Git :

Version control system for code management,collaboration, and maintaining project history.

Maven / Gradle :

Build tools for dependency management and project automation.

Spring Data JPA / Spring Data MongoDB:

Simplifies data access and repository implementation.

Code Implementation:

Entity class:

Item.java:

```
package com.delivery.entity;
import org.springframework.data.annotation.Id;
import org.springframework.data.mongodb.core.mapping.Document;
@Document(collection = "items")
public class Item {
   @Id
   private String id;
   private String name;
   private Double price;
   public Item() {  }
        public Item(String id, String name, Double price) {
                super();
                this.id = id;
                this.name = name;
                this.price = price;
        }
        public String getId() {  return id;  }
        public void setId(String id) {  this.id = id; }
        public String getName() {      return name;    }
        public void setName(String name) {  this.name = name;      }
        public Double getPrice() {     return price;    }
        public void setPrice(Double price) {  this.price = price;                }
   }
```

Order.java:

```
package com.delivery.entity;
import java.time.LocalDateTime;
import java.util.List;
import org.springframework.data.annotation.Id;
import org.springframework.data.mongodb.core.mapping.Document;
import com.fasterxml.jackson.annotation.JsonProperty;
@Document(collection = "orders")
public class Order {
    @Id
    private String id;
    @JsonProperty("userId")
    private String customerId;
    private String address;
    private Double price;
    private String status;  // NEW, PROCESSING, DELIVERED, CANCELLED
    private LocalDateTime createdAt = LocalDateTime.now();
    private LocalDateTime updatedAt = LocalDateTime.now();
    private List<String> itemIds;

    public Order() {}

    public List<String> getItemIds() { return itemIds; }
    public void setItemIds(List<String> itemIds) { this.itemIds = itemIds; }
    public String getId() { return id; }
    public void setId(String id) { this.id = id; }
    public String getCustomerId() { return customerId; }
    public void setCustomerId(String customerId) { this.customerId = customerId; }
     public String getAddress() { return address; }
```

```
    public void setAddress(String address) { this.address = address; }
     public Double getPrice() { return price; }
    public void setPrice(Double price) { this.price = price; }
    public String getStatus() { return status; }
    public void setStatus(String status) { this.status = status; }
    public LocalDateTime getCreatedAt() { return createdAt; }
    public void setCreatedAt(LocalDateTime createdAt) { this.createdAt = createdAt; }
    public LocalDateTime getUpdatedAt() { return updatedAt; }
    public void setUpdatedAt(LocalDateTime updatedAt) { this.updatedAt = updatedAt; }
}
```

Delivery.java

```
package com.delivery.entity;
import java.time.LocalDateTime;
import org.springframework.data.annotation.Id;
import org.springframework.data.mongodb.core.mapping.Document;
@Document(collection = "deliveries")
public class Delivery {
    @Id
    private String id;
    private String orderId;
    private String status; // PENDING, IN_TRANSIT, DELIVERED
    private LocalDateTime createdAt = LocalDateTime.now();
    private LocalDateTime updatedAt = LocalDateTime.now();

    public Delivery() {    }
        public Delivery(String id, String orderId, String status, LocalDateTime createdAt,
LocalDateTime updatedAt) {
                this.id = id;
                this.orderId = orderId;
                this.status = status;
```

```
        this.createdAt = createdAt;
        this.updatedAt = updatedAt;   }
    public String getId() {          return id;    }
    public void setId(String id) { this.id = id;     }
    public String getOrderId() { return orderId; }
    public void setOrderId(String orderId) {  this.orderId = orderId;  }
    public String getStatus() {     return status;  }
    public void setStatus(String status) {this.status = status;     }
    public LocalDateTime getCreatedAt() {       return createdAt;       }
    public void setCreatedAt(LocalDateTime createdAt) {
        this.createdAt = createdAt;  }
    public LocalDateTime getUpdatedAt() {      return updatedAt;      }
    public void setUpdatedAt(LocalDateTime updatedAt) {     this.updatedAt =
updatedAt;
    }
}
```

Repository Layer:

ItemRepository.java:

```
package com.delivery.repository;
import org.springframework.data.mongodb.repository.MongoRepository;
import org.springframework.stereotype.Repository;
import com.delivery.entity.Item;

@Repository
public interface ItemRepository extends MongoRepository<Item,String>{

}
```

OrderRepository.java:

```
package com.delivery.repository;
import java.util.List;
import org.springframework.data.mongodb.repository.MongoRepository;
import org.springframework.stereotype.Repository;
import com.delivery.entity.Order;

@Repository
public interface OrderRepository extends MongoRepository<Order, String>{
        List<Order> findByCustomerId(String customerId);

}
```

DeliveryRepository.java:

```
package com.delivery.repository;
import org.springframework.data.mongodb.repository.MongoRepository;
import org.springframework.stereotype.Repository;
import com.delivery.entity.Delivery;
@Repository
public interface DeliveryRepository extends MongoRepository<Delivery, String> {
   Delivery findByOrderId(String orderId);
}
```

Service Layer:

ItemService:

```
package com.delivery.service;
import java.util.List;
import org.springframework.stereotype.Service;
import com.delivery.entity.Item;
import com.delivery.repository.ItemRepository;

@Service
public class ItemService {
   private final ItemRepository itemRepo;
   public ItemService(ItemRepository itemRepo) {
         this.itemRepo = itemRepo;     }
   public List<Item> getAllItems() {
      return itemRepo.findAll();
   }
   public Item addItem(Item item) {
      return itemRepo.save(item);
   }
   public Item updateItem(String id, Item updated) {
                  if(itemRepo.findById(id) != null) {
                        System.out.println("Item found");
                  }else {
                        System.out.println("Item not found::");
                  }
      return itemRepo.save(updated);
   }
}
```

OrderService.java:

```
package com.delivery.service;
import java.time.LocalDateTime;
import java.util.List;
import java.util.Optional;
import org.springframework.stereotype.Service;
import com.delivery.entity.Item;
import com.delivery.entity.Order;
import com.delivery.repository.ItemRepository;
import com.delivery.repository.OrderRepository;
@Service
public class OrderService {
    private final OrderRepository orderRepo;
    private final ItemRepository itemRepo;
    public OrderService(OrderRepository orderRepo, ItemRepository itemRepo) {
        this.orderRepo = orderRepo;
        this.itemRepo = itemRepo;
    }
    public Order placeOrder(Order order) {
        double totalPrice = 0.0;
        if (order.getItemIds() != null && !order.getItemIds().isEmpty()) {
            for (int i = 0; i < order.getItemIds().size(); i++) {
                String itemId = order.getItemIds().get(i);
                Optional<Item> itemOpt = itemRepo.findById(itemId);
                if (itemOpt.isPresent()) {
                    Item item = itemOpt.get();
                    if (item.getPrice() != null) {
                            totalPrice += item.getPrice();
```

```
            } else {
                System.out.println("⚠ Item price is null for: " + itemId);
            }
        } else {
            System.out.println("⚠ Item not found: " + itemId);
        }
    }
} else {
    System.out.println("⚠ No item IDs provided!");
}
order.setPrice(totalPrice);
order.setStatus("NEW");
order.setCreatedAt(LocalDateTime.now());
order.setUpdatedAt(LocalDateTime.now());
return orderRepo.save(order);
}
public Order updateOrder(String id, Order updated) {
Optional<Order> existingOpt = orderRepo.findById(id);
if (!existingOpt.isPresent()) {
    throw new RuntimeException("Order not found: " + id);
}
Order existing = existingOpt.get();
if (updated.getAddress() != null) {
    existing.setAddress(updated.getAddress());
}
if (updated.getItemIds() != null && !updated.getItemIds().isEmpty()) {
    existing.setItemIds(updated.getItemIds());
    double totalPrice = 0.0;
    for (int i = 0; i < updated.getItemIds().size(); i++) {
        String itemId = updated.getItemIds().get(i);
```

```
            Optional<Item> itemOpt = itemRepo.findById(itemId);
            if (itemOpt.isPresent()) {
                Item item = itemOpt.get();
               if (item.getPrice() != null) {
                   totalPrice += item.getPrice();
               } else {
                   System.out.println("⚠ Item price is null for: " + itemId);
               }
            } else {
               System.out.println("⚠ Item not found: " + itemId);
            }
         }
         existing.setPrice(totalPrice);
      }
      existing.setUpdatedAt(LocalDateTime.now());
      return orderRepo.save(existing);
   }
   public void cancelOrder(String id) {
      orderRepo.deleteById(id);
   }
   public List<Order> getOrder(String id) {
      return orderRepo.findAll();
   }
   public List<Order> getHistory(String customerId) {
      return orderRepo.findByCustomerId(customerId);
   }
}
```

DeliveryService:

```
package com.delivery.service;
import java.time.LocalDateTime;
import org.springframework.stereotype.Service;
import com.delivery.entity.Delivery;
import com.delivery.repository.DeliveryRepository;
@Service
public class DeliveryService {
    private final DeliveryRepository deliveryRepo;
    public DeliveryService(DeliveryRepository deliveryRepo) {
        this.deliveryRepo = deliveryRepo;
    }
    public Delivery getStatus(String orderId) {
        return deliveryRepo.findByOrderId(orderId);
    }
    public Delivery updateStatus(String orderId, String status) {
        Delivery delivery = deliveryRepo.findByOrderId(orderId);
        if (delivery == null) {
            delivery = new Delivery();
            delivery.setOrderId(orderId);
        }
        delivery.setStatus(status);
        delivery.setUpdatedAt(LocalDateTime.now());
        return deliveryRepo.save(delivery);
    }
}
```

Controller Layer:

ItemController.java:

```
package com.delivery.controller;
import java.util.List;
import java.util.Map;
import org.springframework.http.ResponseEntity;
import org.springframework.web.bind.annotation.GetMapping;
import org.springframework.web.bind.annotation.PathVariable;
import org.springframework.web.bind.annotation.PostMapping;
import org.springframework.web.bind.annotation.PutMapping;
import org.springframework.web.bind.annotation.RequestBody;
import org.springframework.web.bind.annotation.RequestMapping;
import org.springframework.web.bind.annotation.RestController;
import com.delivery.entity.Item;
import com.delivery.service.ItemService;
@RestController
@RequestMapping("/items")
public class ItemController {
    private final ItemService itemService;
    public ItemController(ItemService itemService) {
        this.itemService = itemService;
    }
    @GetMapping
    public List<Item> getItems() {
        return itemService.getAllItems();
    }
    @PostMapping("/add")
    public ResponseEntity<Object> addItem(@RequestBody Item item) {
```

```
        Item saved = itemService.addItem(item);
        return ResponseEntity.ok(Map.of("message", "Item added successfully", "data", saved));
    }
    @PutMapping("/{id}")
    public ResponseEntity<Object> updateItem(@PathVariable String id, @RequestBody Item
item) {
        Item updated = itemService.updateItem(id, item);
        return ResponseEntity.ok(Map.of("message", "Item updated successfully", "data",
updated));
    }
}
```

OrderController.java:

```
package com.delivery.controller;
import java.util.List;
import java.util.Map;
import org.springframework.http.ResponseEntity;
import org.springframework.web.bind.annotation.DeleteMapping;
import org.springframework.web.bind.annotation.GetMapping;
import org.springframework.web.bind.annotation.PathVariable;
import org.springframework.web.bind.annotation.PostMapping;
import org.springframework.web.bind.annotation.PutMapping;
import org.springframework.web.bind.annotation.RequestBody;
import org.springframework.web.bind.annotation.RequestMapping;
import org.springframework.web.bind.annotation.RestController;
import com.delivery.entity.Order;
import com.delivery.service.OrderService;
@RestController
@RequestMapping("/orders")
public class OrderController {
    private final OrderService orderService;
    public OrderController(OrderService orderService) {
```

```
        this.orderService = orderService;
    }
    @PostMapping("/add")
    public ResponseEntity<Object> placeOrder(@RequestBody Order order) {
        Order saved = orderService.placeOrder(order);
        return ResponseEntity.ok(Map.of("message", "Order placed successfully", "data",
saved));
    }
    @GetMapping("/{id}")
    public List<Order> getOrder(@PathVariable String id) {
        return orderService.getOrder(id);
    }
    @PutMapping("/{id}")
    public Order updateOrder(@PathVariable String id, @RequestBody Order order) {
        return orderService.updateOrder(id, order);
    }
    @DeleteMapping("/{id}")
    public void cancelOrder(@PathVariable String id) {
        orderService.cancelOrder(id);
    }
    @GetMapping("/history/{userId}")
    public List<Order> getHistory(@PathVariable String userId) {
        return orderService.getHistory(userId);
    }
}
```

DeliveryController.java:

```
package com.delivery.controller;
import java.util.Map;
import org.springframework.http.ResponseEntity;
import org.springframework.web.bind.annotation.GetMapping;
import org.springframework.web.bind.annotation.PathVariable;
```

```
import org.springframework.web.bind.annotation.PutMapping;
import org.springframework.web.bind.annotation.RequestBody;
import org.springframework.web.bind.annotation.RequestMapping;
import org.springframework.web.bind.annotation.RestController;
import com.delivery.entity.Delivery;
import com.delivery.service.DeliveryService;
@RestController
@RequestMapping("/delivery")
public class DeliveryController {
    private final DeliveryService deliveryService;
    public DeliveryController(DeliveryService deliveryService) {
        this.deliveryService = deliveryService;
    }
    @GetMapping("/{orderId}/status")
    public ResponseEntity<Object> getStatus(@PathVariable String orderId) {
        Delivery deliver = deliveryService.getStatus(orderId);
        return ResponseEntity.ok(Map.of(
            "message", "Delivery status fetched successfully",
            "data", deliver
        ));
    }
    @PutMapping("/{orderId}/cancel")
    public ResponseEntity<Object> cancelOrder(@PathVariable String orderId) {
        Delivery deliver = deliveryService.getStatus(orderId);
        if (deliver == null) {
            return ResponseEntity.notFound().build();
        }
        String status = deliver.getStatus() != null ? deliver.getStatus().toUpperCase() : "";
        if ("DELIVERED".equals(status)) {
            return ResponseEntity
```

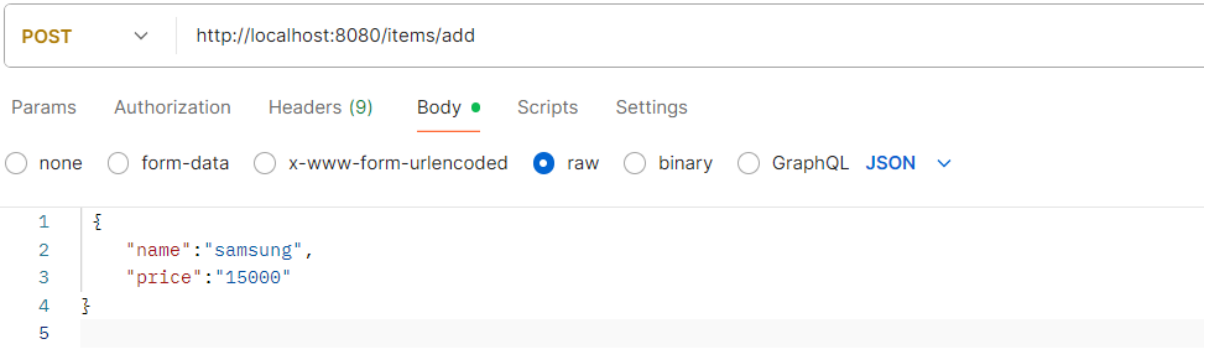
```
                .badRequest()
                .body(Map.of("message", "Order already delivered, cannot cancel", "data",
deliver));
        }
        if ("CANCELLED".equals(status)) {
            return ResponseEntity
                .badRequest()
                .body(Map.of("message", "Order already cancelled", "data", deliver));
        }
        Delivery updated = deliveryService.updateStatus(orderId, "CANCELLED");
        return ResponseEntity.ok(Map.of("message", "Order cancelled successfully", "data",
updated));
    }
@PutMapping("/{orderId}/update")
    public ResponseEntity<Object> updateStatus(@PathVariable String orderId,
     @RequestBody Delivery request) {
        Delivery updated = deliveryService.updateStatus(orderId, request.getStatus());
        return ResponseEntity.ok(Map.of(
            "message", "Delivery status updated successfully",
            "data", updated
        ));
    }
```

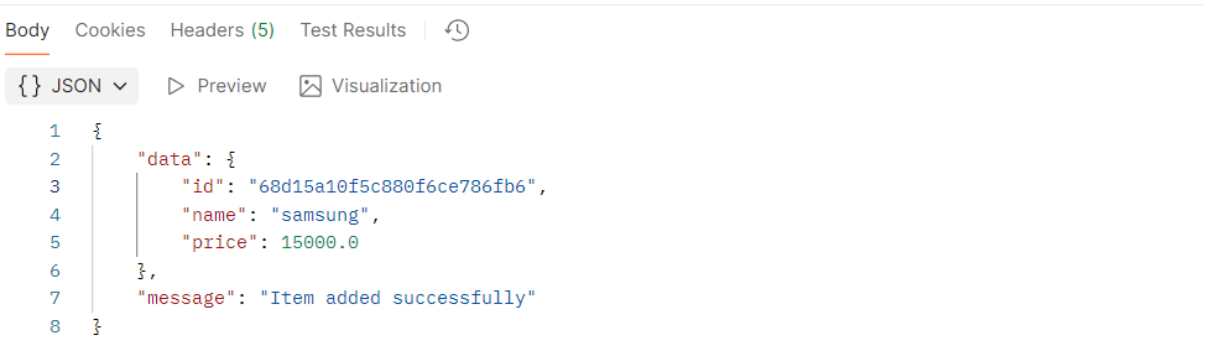
OutPut Format:

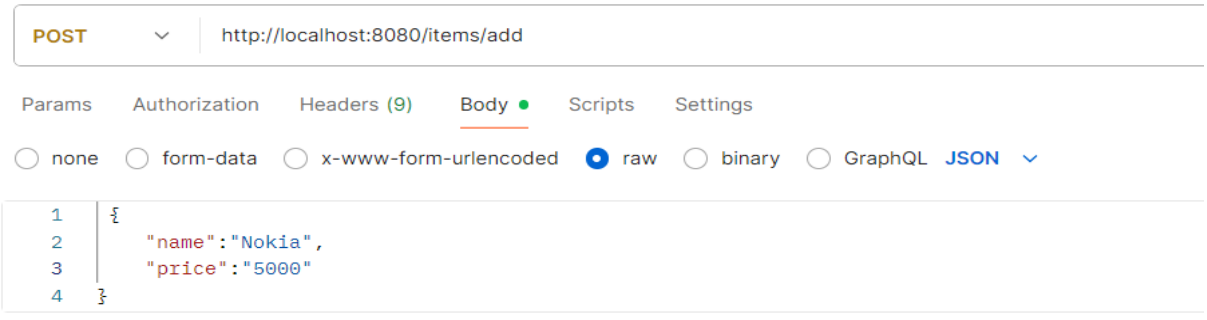
Items List:

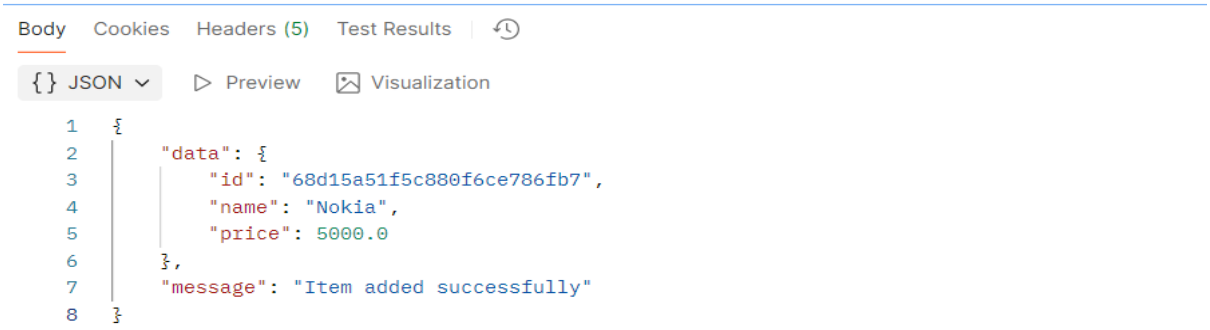
1.POST Request (Add New Item):

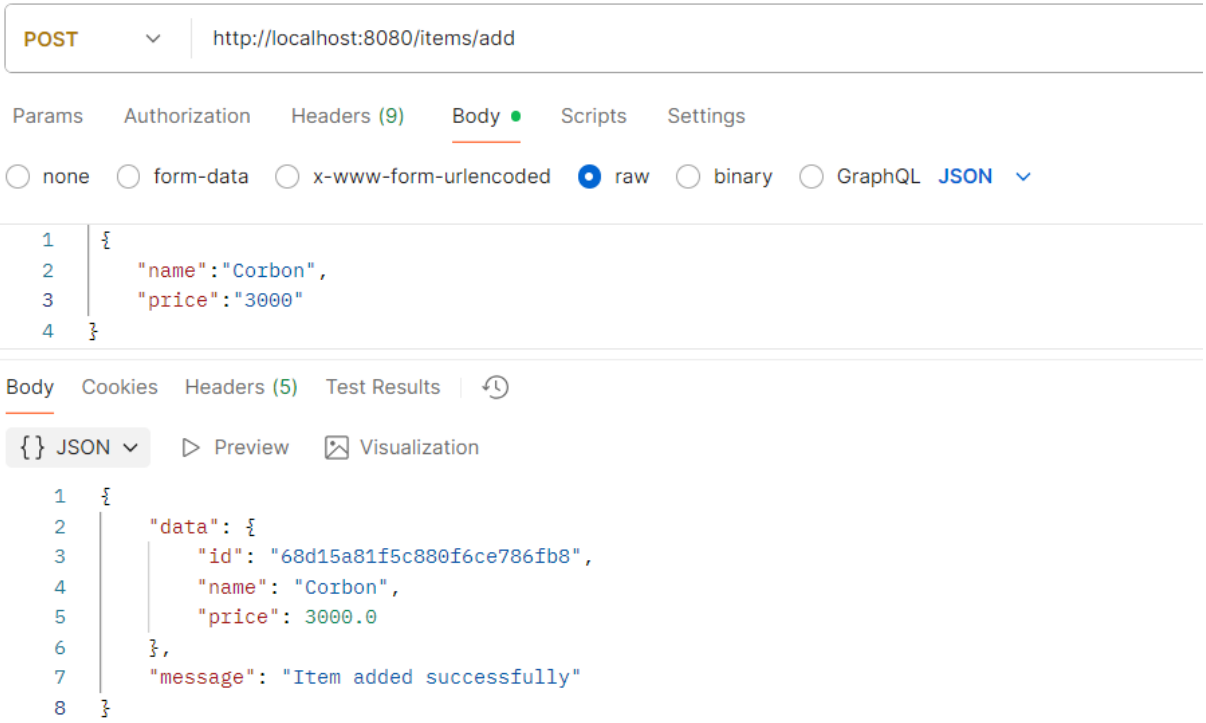
- **Method**: POST
- **URL**: http://localhost:8080/items/add





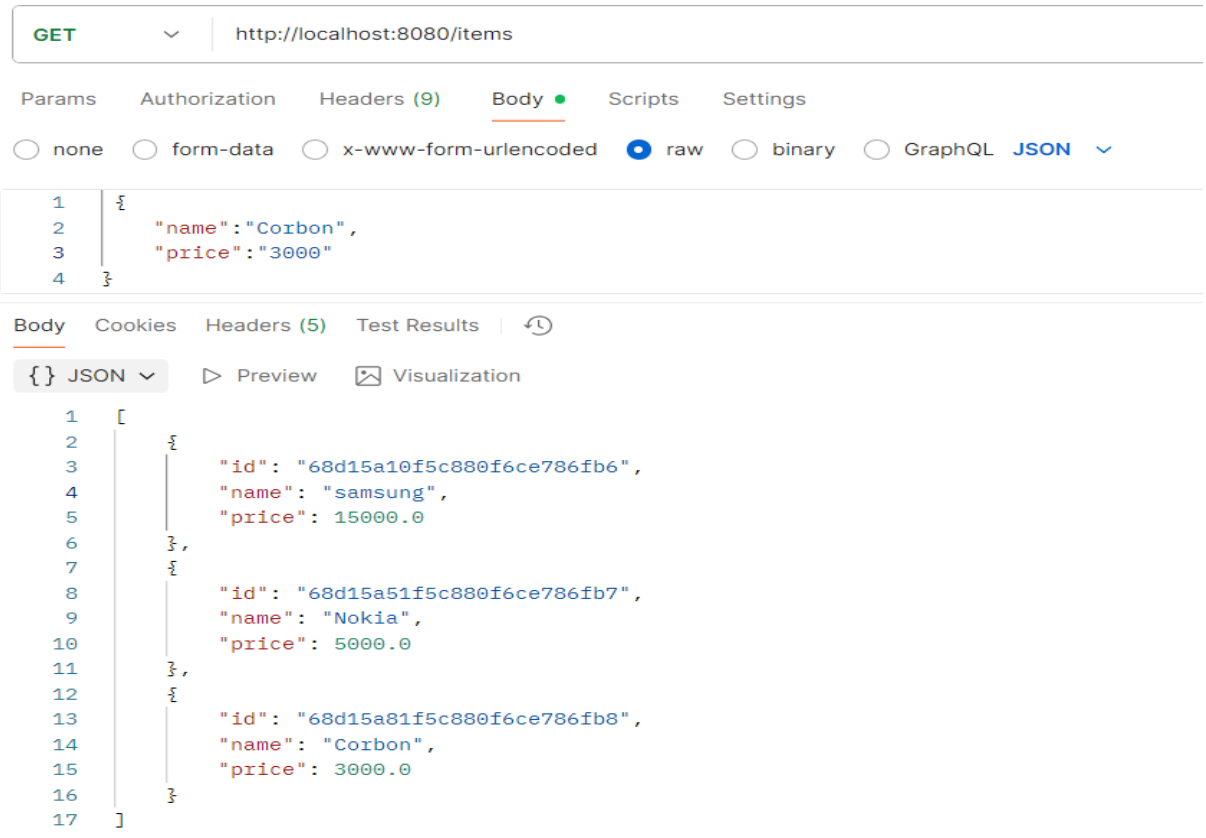






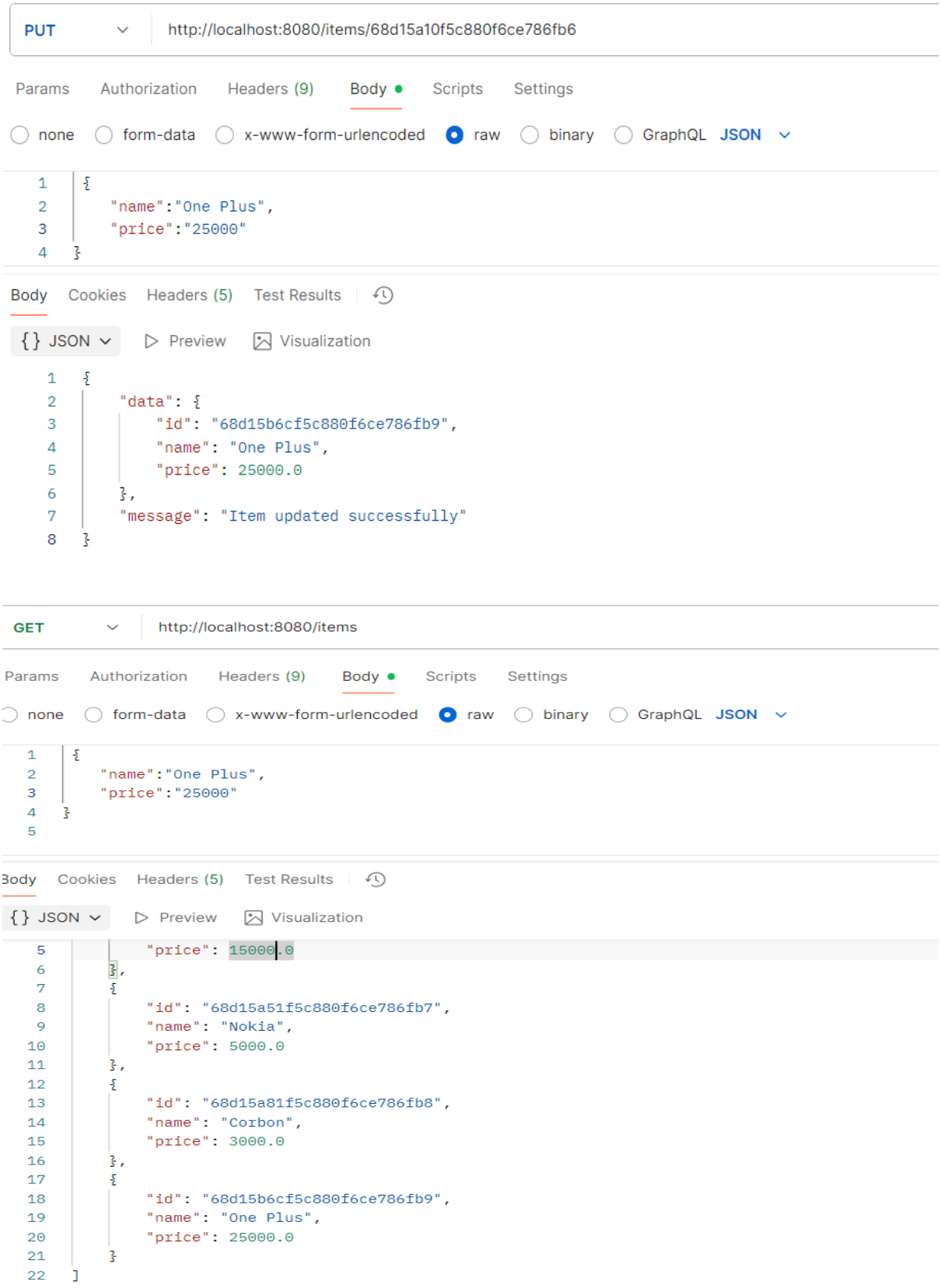
2. GET Request (Retrieve All Items)

- **Method**: GET
- **URL**: http://localhost:8080/items



3. PUT Request (Update Existing Item)

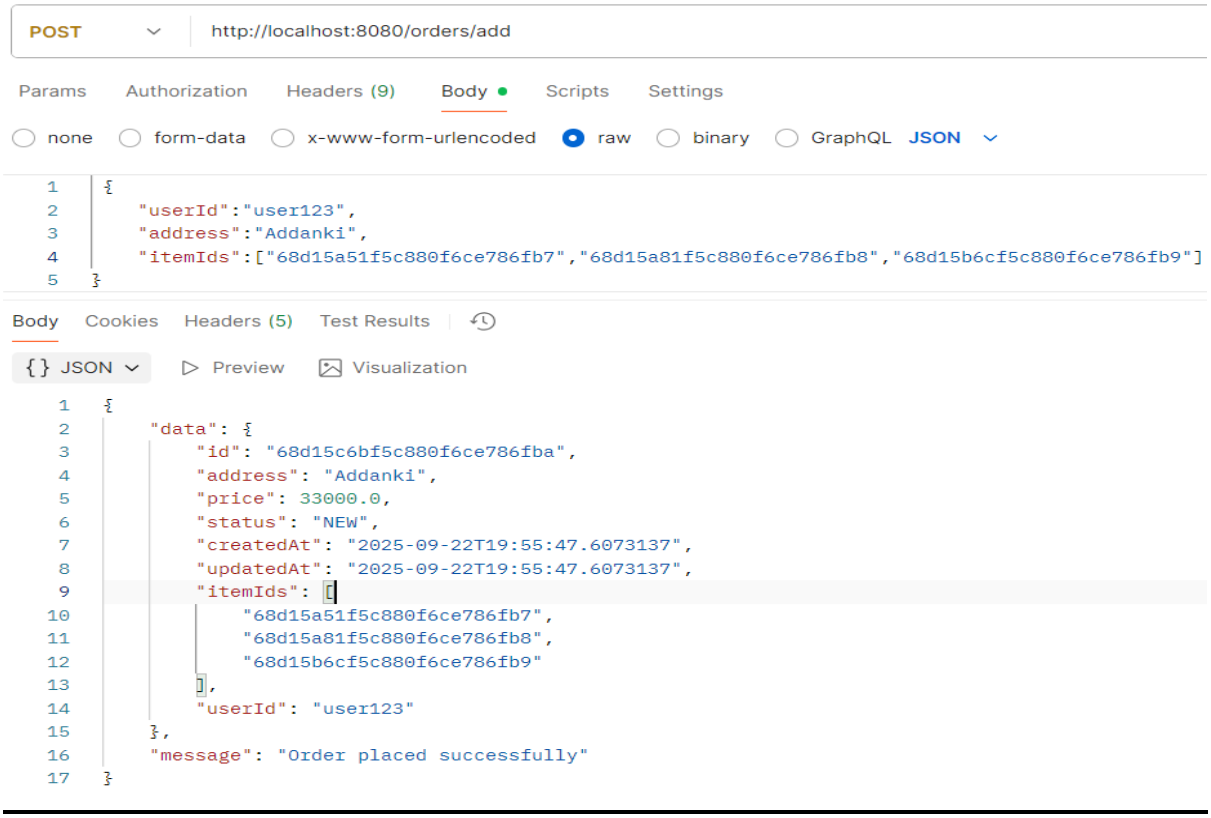
- **Method**: PUT
- **URL**: http://localhost:8080/items/{id}

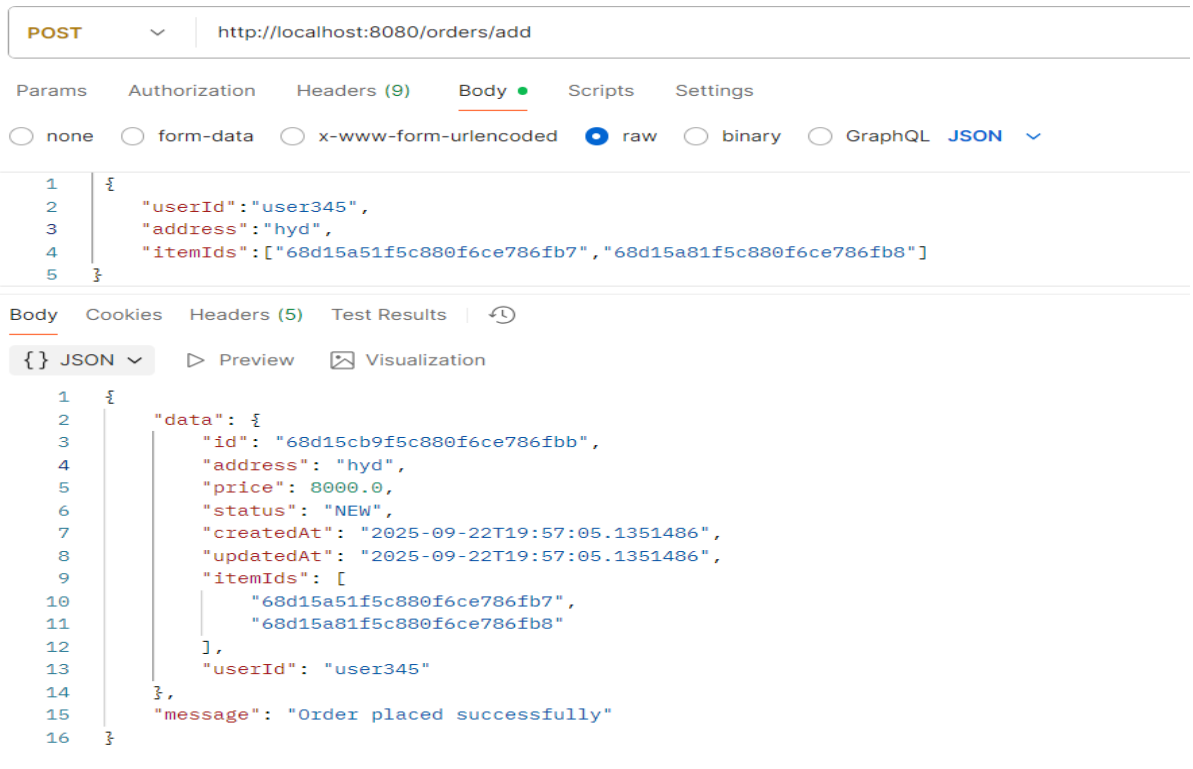


Order List:

1.POST Request (Add New Item):

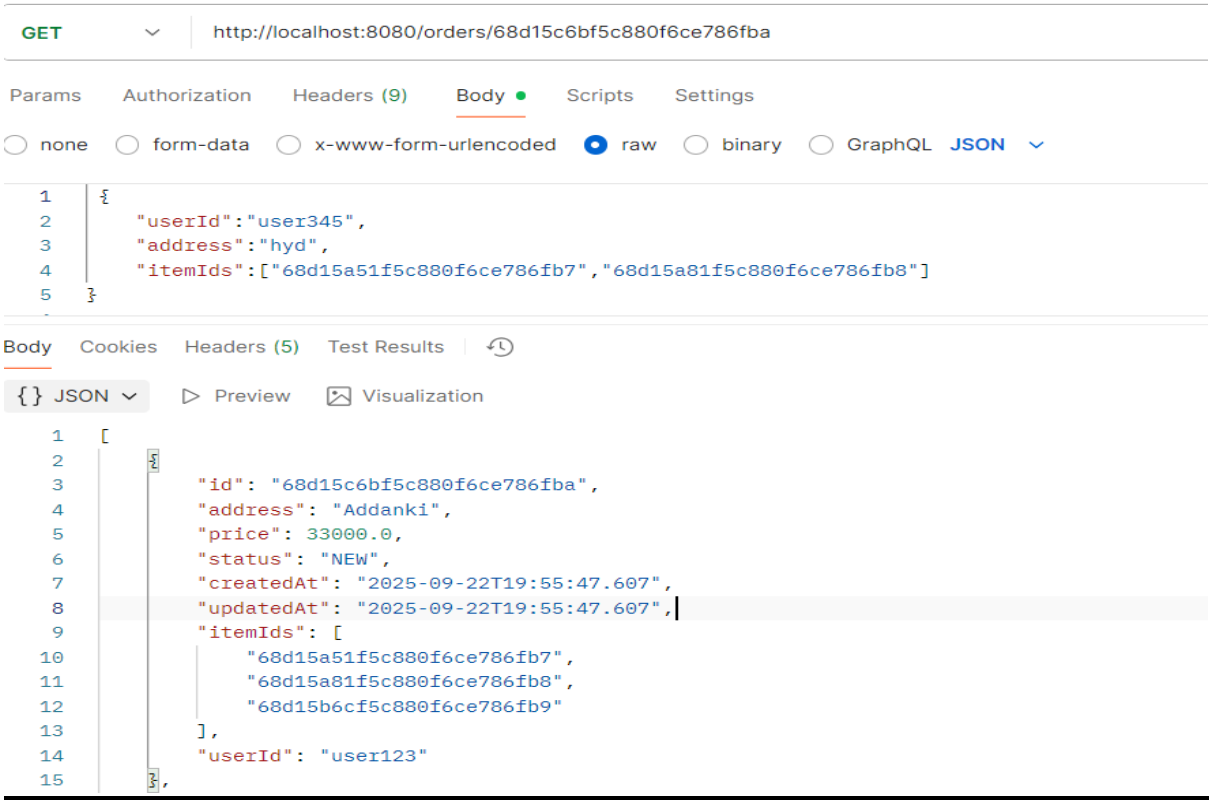
- **Method**: POST
- **URL**: http://localhost:8080/orders/adds





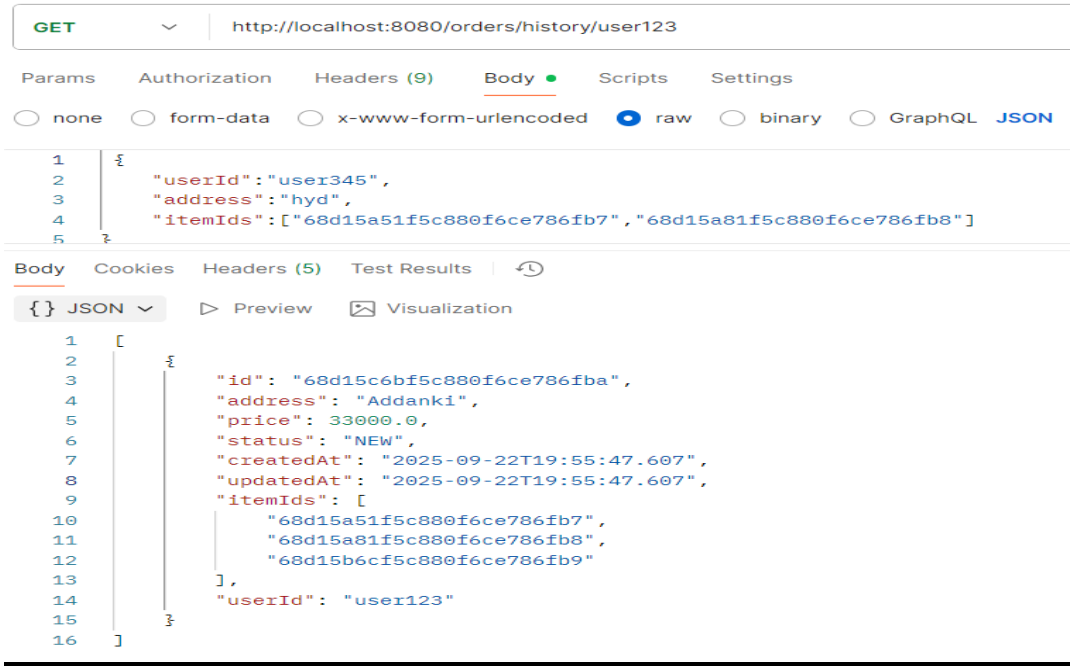
2.Get Order by Id

- **Method**: POST
- **URL**: http://localhost:8080/orders/{id}



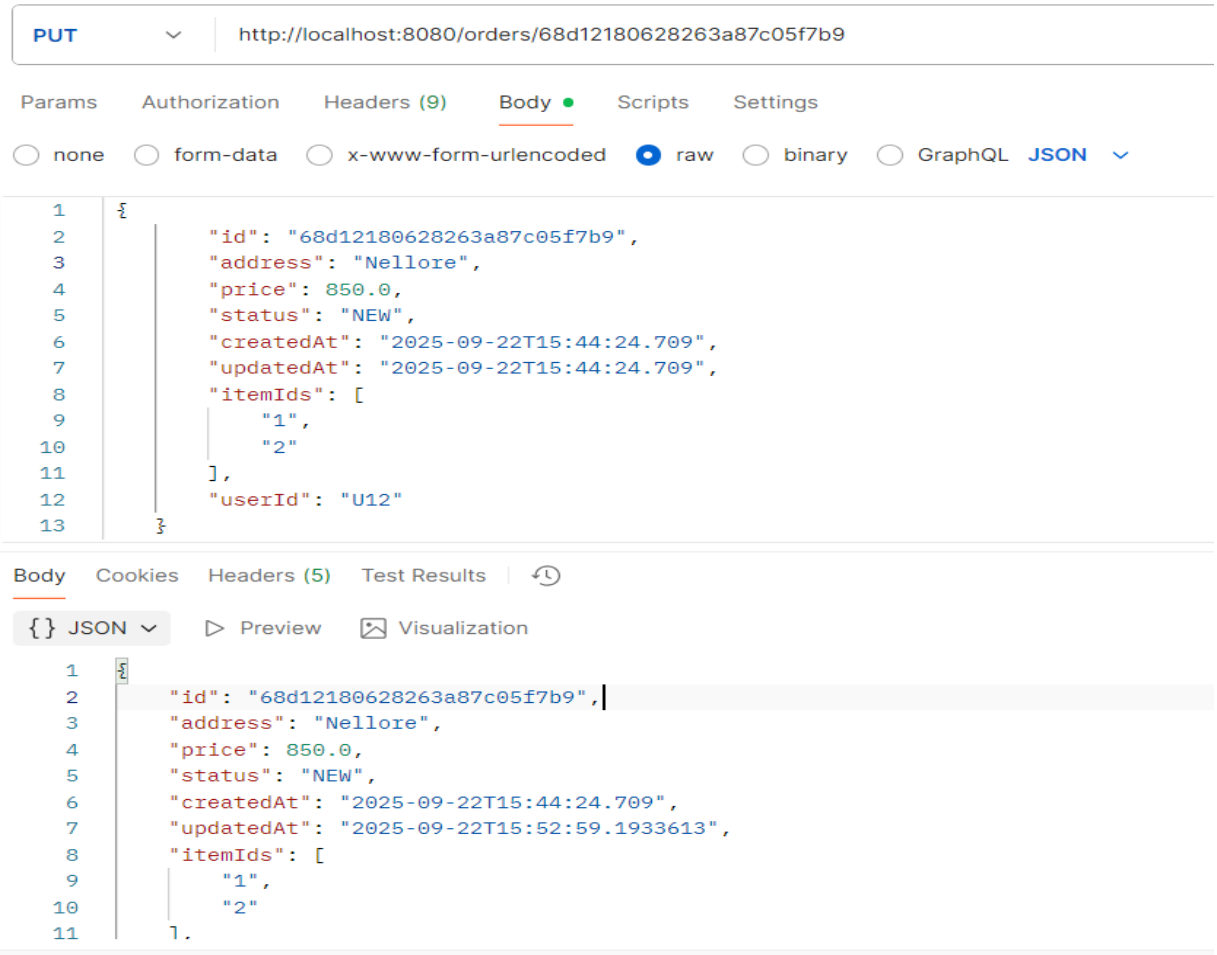
3.Get Order History by User

- **Method:** Get
- **URL:** http://localhost:8080/orders/history/{userId}



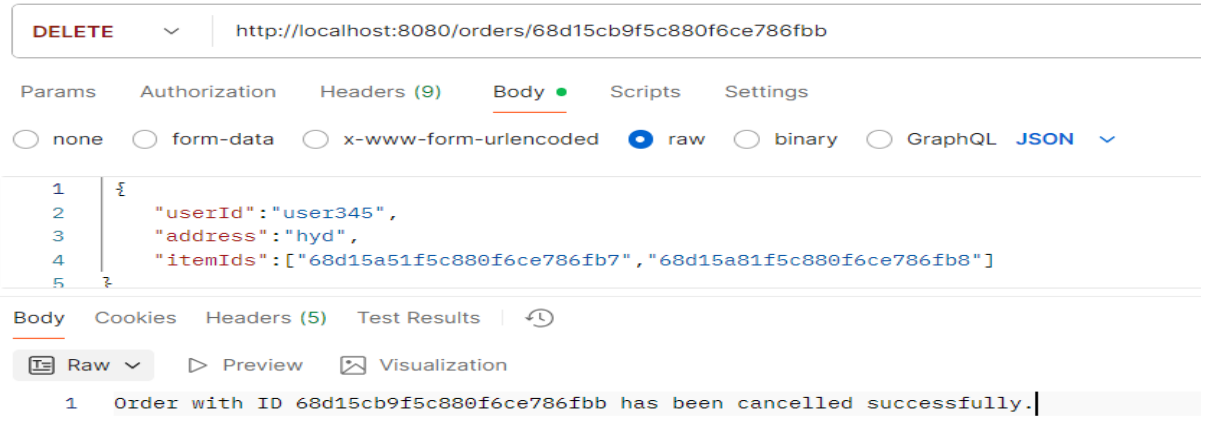
4.Update Order

- **Method:** put
- **URL:** http://localhost:8080/orders/{id}



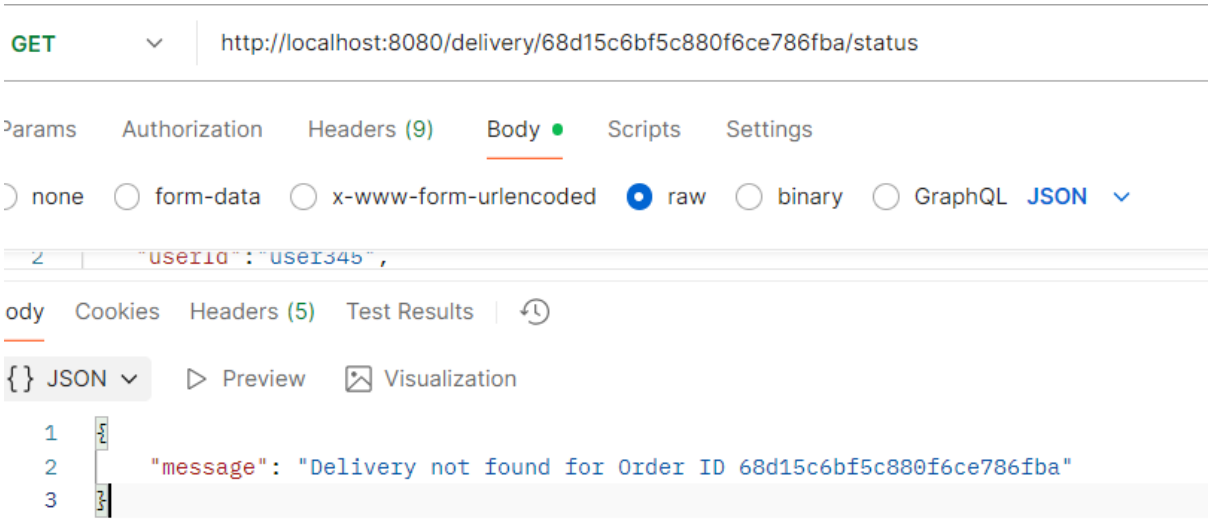
5.Delete Order

- **Method:** Delete
- **URL:** http://localhost:8080/orders/{id}



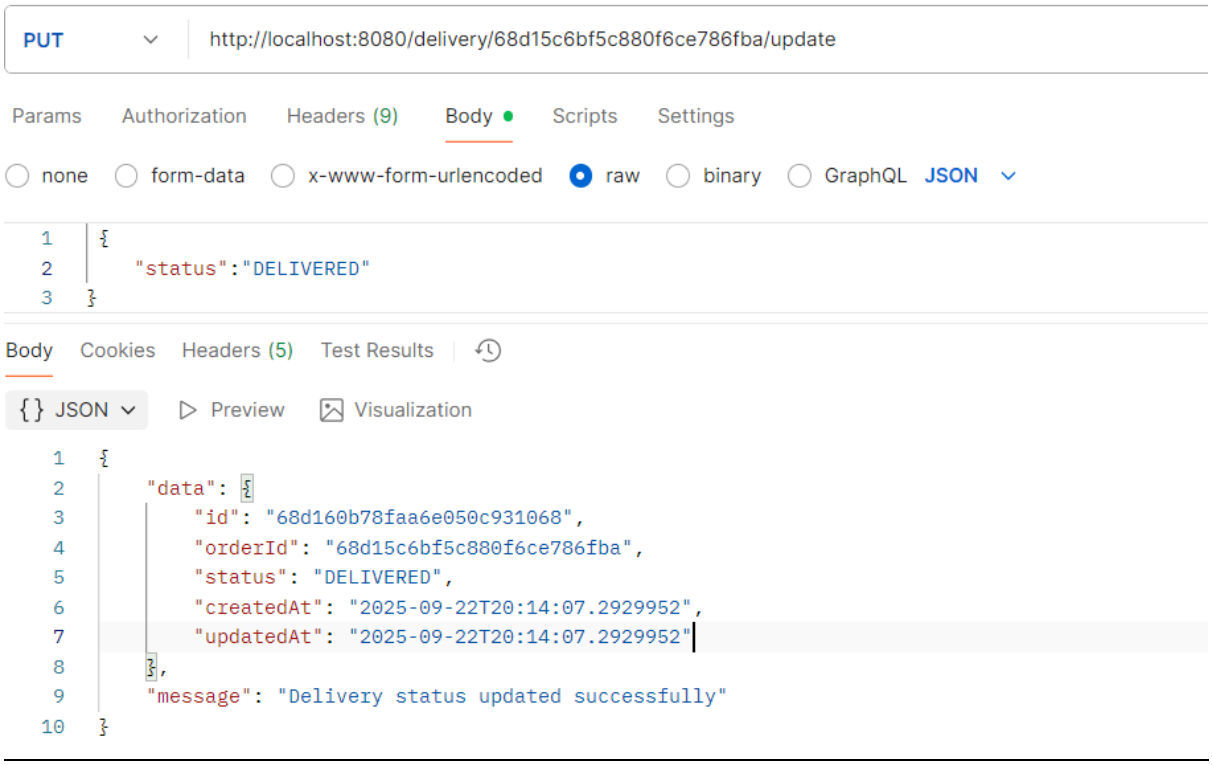
6.Get Delivery Status

- **Method:** GET
- **URL:** http://localhost:8080/delivery/{orderId}/status



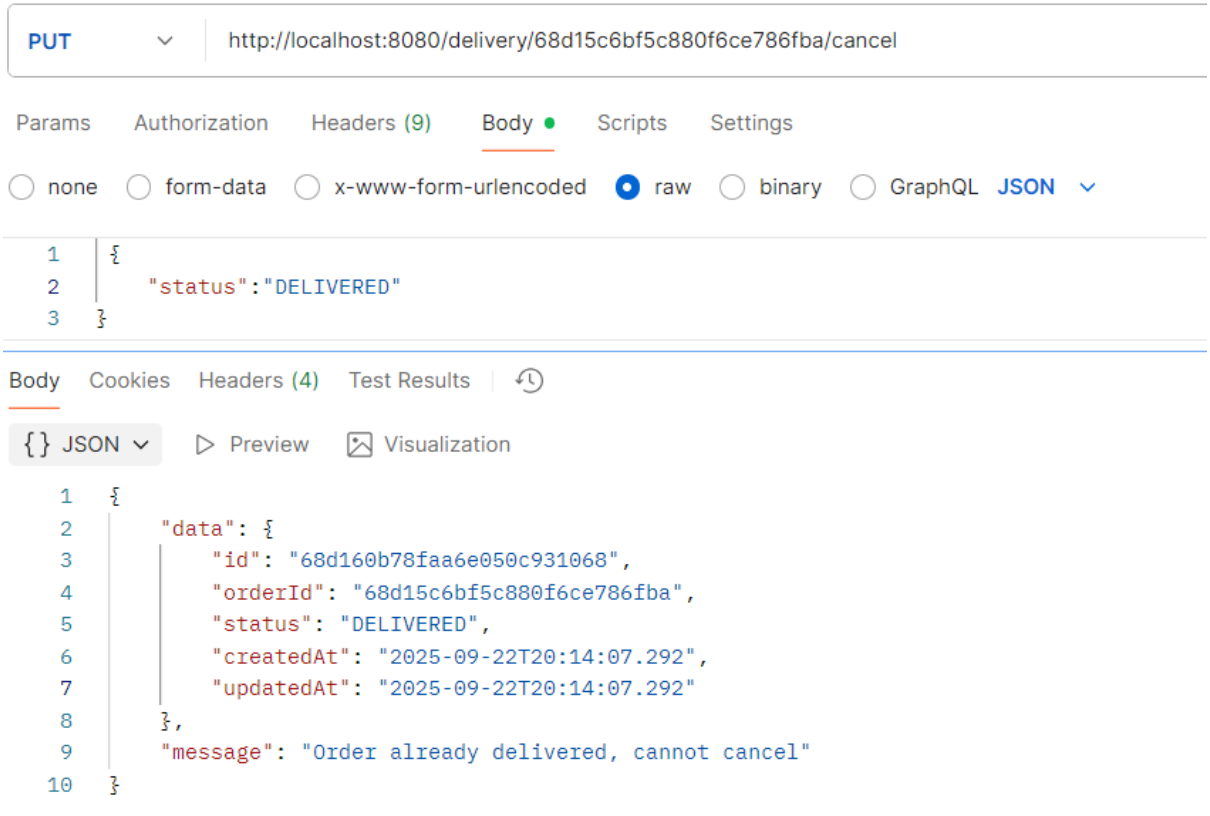
7.Update Delivery Status

- **Method:** PUT
- **URL:** http://localhost:8080/delivery/{orderId}/update



8.Cancel Order:

- **Method:**PUT
- **URL:** http://localhost:8080/delivery/{orderId}/cancel



9.Update Delivery Status

- **Method:** PUT
- **URL:** http://localhost:8080/delivery/{orderId}/update

10.Cancel Order:

- **Method:** PUT
- **URL:** http://localhost:8080/delivery/{orderId}/cancel