Application Canvas

Name	Order Pickup Service	
Description	Provides RESTful API services to Create, View, Cancel and show status of pickups	
Service API		
Commands	Synchronous	
	createOne(Pickup)	Used to initialize and create a single pickup order
	getAllOrders()	Used to view all the present pickup orders from the database
	getPickStatus(long)	Used to view a status of a specific pickup order using pickId
	cancelPickup(long)	Used to cancel an already placed pickup
	createPickups(List<Pickup>)	Used to create batch of pickups using list of pickup orders
Implementation	3-tier Data Model:	
	API layer <-> Service Layer <-> Data Layer	
Observability	orderDetails itemDetails warehouseDetails employeeDetails pickupDetails	

Database Schema:

The given database in the legacy schema is monolithic and contains all the details in a single table. The first major concern is to normalize the given schema.
The data is split into 5 logical data groups, i.e., 5 tables. This leads to following advantages:

- Logical data division
- Increased readability
- Reduce redundancy
- Greater data organization
- Data consistency

Having said that, the schema is divided into 5 tables:

- *pickup*: This table consists of the information of all the pickup orders. Relationships with other tables:
  - *warehouse:* one to one mapping
  - *item:* one to many mapping
  - *orders:* one to many mapping
  - *employee:* one to one mapping
- *item*: This table consists of the details about the item that is picked up.
  - *pickup*: many to one mapping
- *warehouse*: This table consists of the details about the warehouse and pickup.
  - *pickup*: one to one mapping
- *employee*: This table contains the details about the employees and the pickup orders.
  - *pickup*: one to one mapping

- *orders*: This table contains the details for the orders placed.
    - *pickup:* many to one mapping

REST API Design:

- After designing the database, next step is to design the API and its end points. The API design is divided into 3 sections:
    - API layer
    - Service Layer
    - Data layer
- The API layer is responsible for all the CRUD operations, i.e., defining the end points. The operations are defined in the PickupManagmentController class. This class will further use the PickupManagementService class that is in turn connected to the PickupManagementRepository that extends the JpaRepository used to connect to the Postgres Database in the backend.
- There are several annotations that are used in Spring to perform several operations in the background without actually writing everything from scratch.
- The prominent annotations in this application are:
    - @Service: Class level annotation responsible for letting marking a class that performs some service
    - @Entity: Tt specifies that the class is an entity and is mapped to a database table
    - @RestController: It is used to create RESTful web services
    - @RequestMapping: It specifies the URI for the end point
    - @GetMapping: It is used to map GET request to specific handler methods
    - @PostMapping: It is used to map POST request to specific handler methods
    - @Autowired: It is used for object dependency injection
    - @Table: It specifies the name of the database table that is to be used for mapping
- The root for the RestController is “/api”. The various endpoints exposed in this application are:
    - GET: getAllOrders ("/all"):
        - returns a list of orders in the Order table
    - GET: getPickStatus ("/getPickStatus/{Id"}):
        - This route takes in a pickup*Id* and returns the pickup order associated with that id
    - POST: createOne ("/createOne"):
        - This takes in the RequestBody from the POST request and saves that pickup order
        - Save method in the OrderService class, will set the createdDate to UTC
        - It will also save the Status on the order as PICKED
    - PUT: cancelPickup ("/cancelPickup/{Id}")
        - This method will update the Status of the existing pickup order to CANCELLED
    - POST: createPickups ("/createPickups")
        - This endpoint receives the *batch* of pickup orders and then creates

Logging:

- Lombok Slf4j package dependency is used to log information in the console
- It is easier and helps in debugging and troubleshooting the code
- Logging also helps in keeping check on the activities performed by the application for future reference
- It helps in identifying records from the

Test:

- Initial phase of testing done using Postman. Setting inputs and checking for desired outputs.
- Added Junit tests to test the application that checks multiple endpoints against test cases provided in the PickupServiceManagementTest.java class
- There can be multiple tests that can be added to make the application more tolerant

Kafka:

Used Kafka to send singular pickup orders as well as batch pickup orders for real time tracking. Configured the KafkaProducer and KafkaConsumer to accept and display the data. In order to see Kafka at work, Conduktor is used.

Sample JSON Batch input:


```
[
  {

    "pickDate": "2010-10-10T07:00:00.000+00:00",
    "pickStore": "ZaraIndia",
    "pickZone": "Pavillion",
    "pickBatchId": 18,
    "warehouse": {
       "pickWarehouseId": 18,
       "pickToteId": 8,
       "pickToteCartId": 8
    }
    ,
    "orderList": [
       {
          "pickOrderId": 34,
          "pickOrderItemQty": 4,
          "pickOrderItemHeight": 100.0,
          "pickOrderItemWidth": 120.2,
          "pickOrderItemLength": 220.5
       },
       {
```

```
            "pickOrderId": 35,
            "pickOrderItemQty": 6,
            "pickOrderItemHeight": 10.0,
            "pickOrderItemWidth": 10.2,
            "pickOrderItemLength": 10.5
        }
    ],
    "employee": {
        "pickEmpId": 18,
        "pickEmpPerfStartDtTm": "2010-10-10T08:00:00.000+00:00",
        "pickEmpPerfEndDtTm": "2011-11-11T07:00:00.000+00:00",
        "pickPerfId": 14
    },
    "itemList": [
        {
            "pickItemId": 34,
            "pickItemQty": 3,
            "pickItemWeight": 25.0,
            "pickItemHeight": 12.2,
            "pickItemLength": 10.5,
            "pickSubstItem": 2.0,
            "pickItemIsAllowed": "yes"
        },
        {
            "pickItemId": 35,
            "pickItemQty": 5,
            "pickItemWeight": 255.0,
            "pickItemHeight": 152.2,
            "pickItemLength": 150.5,
            "pickSubstItem": 52.50,
            "pickItemIsAllowed": "No"
        }
    ]
},
{

    "pickDate": "2010-10-10T07:00:00.000+00:00",
```

```
"pickStore": "AdidasIndia",
"pickZone": "Pavillion",
"pickBatchId": 19,
"warehouse": {
    "pickWarehouseId": 19,
    "pickToteId": 9,
    "pickToteCartId": 9
}
,
"orderList": [
    {
        "pickOrderId": 36,
        "pickOrderItemQty": 4,
        "pickOrderItemHeight": 100.0,
        "pickOrderItemWidth": 120.2,
        "pickOrderItemLength": 220.5
    },
    {
        "pickOrderId": 37,
        "pickOrderItemQty": 6,
        "pickOrderItemHeight": 10.0,
        "pickOrderItemWidth": 10.2,
        "pickOrderItemLength": 10.5
    }
],
"employee": {
    "pickEmpId": 19,
    "pickEmpPerfStartDtTm": "2010-10-10T08:00:00.000+00:00",
    "pickEmpPerfEndDtTm": "2011-11-11T07:00:00.000+00:00",
    "pickPerfId": 3
},
"itemList": [
    {
        "pickItemId": 36,
        "pickItemQty": 3,
        "pickItemWeight": 25.0,
        "pickItemHeight": 12.2,
```

```
            "pickItemLength": 10.5,
            "pickSubstItem": 2.0,
            "pickItemIsAllowed": "yes"
        },
        {
            "pickItemId": 37,
            "pickItemQty": 5,
            "pickItemWeight": 255.0,
            "pickItemHeight": 152.2,
            "pickItemLength": 150.5,
            "pickSubstItem": 52.50,
            "pickItemIsAllowed": "No"
        }
    ]
},
{

    "pickDate": "2010-10-10T07:00:00.000+00:00",
    "pickStore": "AdidasIndia",
    "pickZone": "Pavillion",
    "pickBatchId": 20,
    "warehouse": {
        "pickWarehouseId": 20,
        "pickToteId": 9,
        "pickToteCartId": 9
    }
    ,
    "orderList": [
        {
            "pickOrderId": 38,
            "pickOrderItemQty": 4,
            "pickOrderItemHeight": 100.0,
            "pickOrderItemWidth": 120.2,
            "pickOrderItemLength": 220.5
        },
        {
            "pickOrderId": 39,
```

```
            "pickOrderItemQty": 6,
            "pickOrderItemHeight": 10.0,
            "pickOrderItemWidth": 10.2,
            "pickOrderItemLength": 10.5
        }
    ],
    "employee": {
        "pickEmpId": 20,
        "pickEmpPerfStartDtTm": "2010-10-10T08:00:00.000+00:00",
        "pickEmpPerfEndDtTm": "2011-11-11T07:00:00.000+00:00",
        "pickPerfId": 3
    },
    "itemList": [
        {
            "pickItemId": 38,
            "pickItemQty": 3,
            "pickItemWeight": 25.0,
            "pickItemHeight": 12.2,
            "pickItemLength": 10.5,
            "pickSubstItem": 2.0,
            "pickItemIsAllowed": "yes"
        },
        {
            "pickItemId": 39,
            "pickItemQty": 5,
            "pickItemWeight": 255.0,
            "pickItemHeight": 152.2,
            "pickItemLength": 150.5,
            "pickSubstItem": 52.50,
            "pickItemIsAllowed": "No"
        }
    ]
  }

]
```