**Friday – 15/12/2023**

*answer*

*from datetime import datetime*

*class ProductData:*

*def \_\_init\_\_(self, product\_id, name, manufacture\_date, price):*

*self.product\_id = product\_id*

*self.name = name*

*self.manufacture\_date = manufacture\_date*

*self.price = price*

*class ProductController:*

*def \_\_init\_\_(self):*

*self.products = []*

*def create\_product(self, product\_data):*

*self.products.append(product\_data)*

*def read\_products(self):*

*return self.products*

*def update\_product(self, product\_id, new\_data):*

*for product in self.products:*

*if product.product\_id == product\_id:*

*product.\_\_dict\_\_.update(new\_data.\_\_dict\_\_)*

*break*

*def delete\_product(self, product\_id):*

*self.products = [product for product in self.products if product.product\_id != product\_id]*

*class ProductService:*

*@staticmethod*

*def validate\_product\_data(product\_data):*

*# Add validation logic if needed*

*return True*

*class ProductApplication:*

*def \_\_init\_\_(self):*

*self.controller = ProductController()*

*self.service = ProductService()*

*def add\_product(self, product\_id, name, manufacture\_date, price):*

*product\_data = ProductData(product\_id, name, manufacture\_date, price)*

*if self.service.validate\_product\_data(product\_data):*

*self.controller.create\_product(product\_data)*

*print(f"Product '{name}' added successfully.")*

*def list\_products(self):*

*products = self.controller.read\_products()*

*if not products:*

*print("No products available.")*

*else:*

*for product in products:*

*print(f"ID: {product.product\_id}, Name: {product.name}, Manufacture Date: {product.manufacture\_date}, Price: {product.price}")*

*def update\_product(self, product\_id, new\_name=None, new\_manufacture\_date=None, new\_price=None):*

*updated\_data = ProductData(product\_id, new\_name, new\_manufacture\_date, new\_price)*

*self.controller.update\_product(product\_id, updated\_data)*

*print(f"Product with ID {product\_id} updated successfully.")*

*def delete\_product(self, product\_id):*

*self.controller.delete\_product(product\_id)*

*print(f"Product with ID {product\_id} deleted successfully.")*

*# Example Usage*

*if \_\_name\_\_ == "\_\_main\_\_":*

*app = ProductApplication()*

*# Adding products*

*app.add\_product(1, "Product1", datetime(2023, 1, 1), 100.0)*

*app.add\_product(2, "Product2", datetime(2023, 2, 1), 150.0)*

*# Listing products*

*app.list\_products()*

*# Updating product*

*app.update\_product(1, new\_name="UpdatedProduct", new\_price=120.0)*

*# Listing products after update*

*app.list\_products()*

*# Deleting product*

*app.delete\_product(2)*

*# Listing products after delete*

*app.list\_products()*