**Problem Statement**

Develop a web based application similar to ecommerce site(Online Shopping Site).

Login & Registration functionality should be present.

After login user should be able to see number of products with their available quantity, description & price. He should also be able to search a particular product or sort the products based on name & category.

Design a shopping cart for the customer. He should be able to add products with quantity to the cart & remove products from it.

Checkout feature – After addition of products checkout option to see cart with all added products & total amount based on product & quantity.

If available product quantity is zero then product must not get added into the cart (Display a proper message to the user).

**Application Flow**

1. Customer Login
2. Check if account present or not, if no go to next step else go to step 4
3. Customer Registration
4. Login
5. Home
6. Search for products/ Sort the products
7. Check the quantity
8. Add the product/s to the cart
9. Check the stock of that product, if in stock then customer can add product else cannot add
10. Remove the products from the cart (if empty give a proper message)
11. Checkout
12. Display order details with products, quantity & total price.

**Design Patterns**

1. Singleton
2. Abstract Factory – For categories of products. Factory of factories.
3. Decorator – For additional features of similar products
4. Visitor – For shopping cart, ex – calculation logic of total amount including taxes/discounts(if applicable)

**Database Design**

1. CUSTOMER (customer id, user name, password,customer name, address, contact, birth date)
2. PRODUCT (product id, product name, description, price, stock,category)
3. CATEGORY (category id,category name, category description)
4. CUSTOMER\_ORDER (order id, customer id,order time, order status)
5. PRODUCT\_ORDER (order id, product id, quantity)