# CDK Global Assignment

The story tells to apply discount across different slabs for different types for Customer, in the scope of the problem they are Premium and Regular.
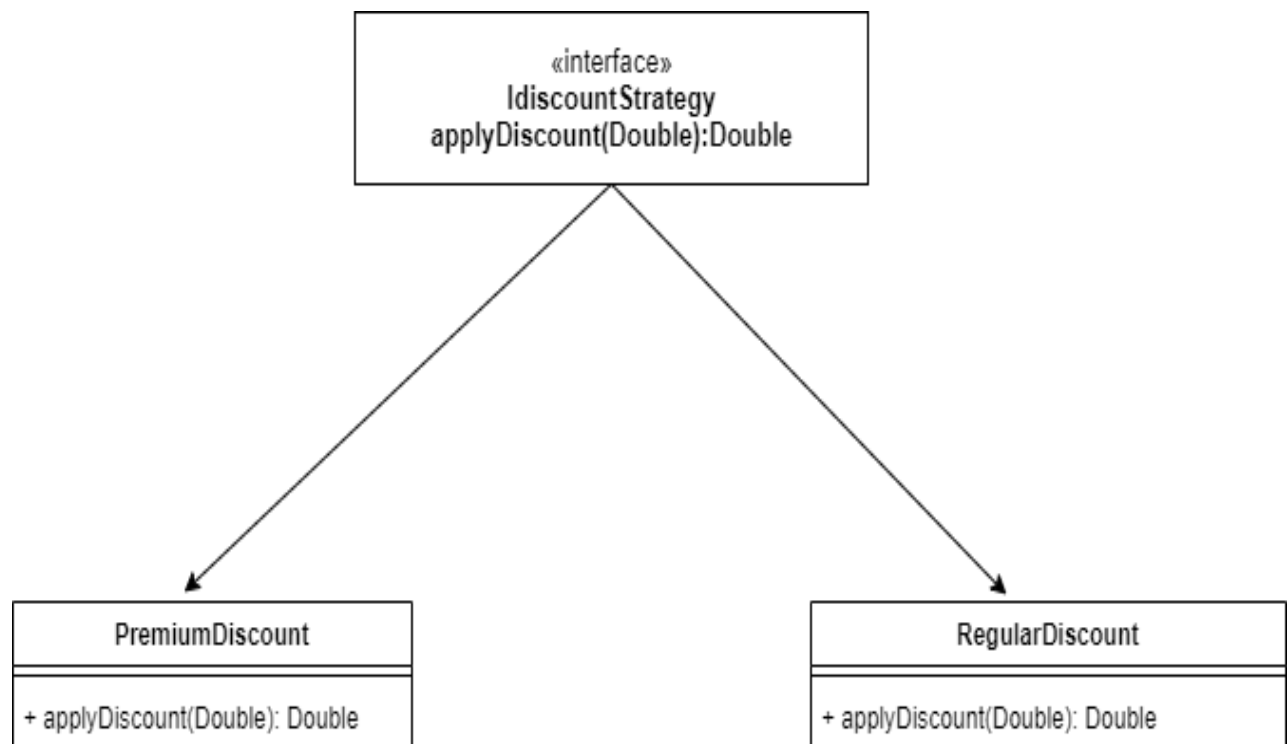
Whenever we see a problem of this nature where one needs to take different strategies based on input, the standard way of solving is using Strategy Design Pattern. Advantage of doing this way is loose coupling and strategy is passed as a method argument.

The below design is extensible for future use with minimal code change.

A separate constants file is use to as the percentage discount for the above state customers can change over a period of time. This way only this file needs to be changed without touching the main business logic.
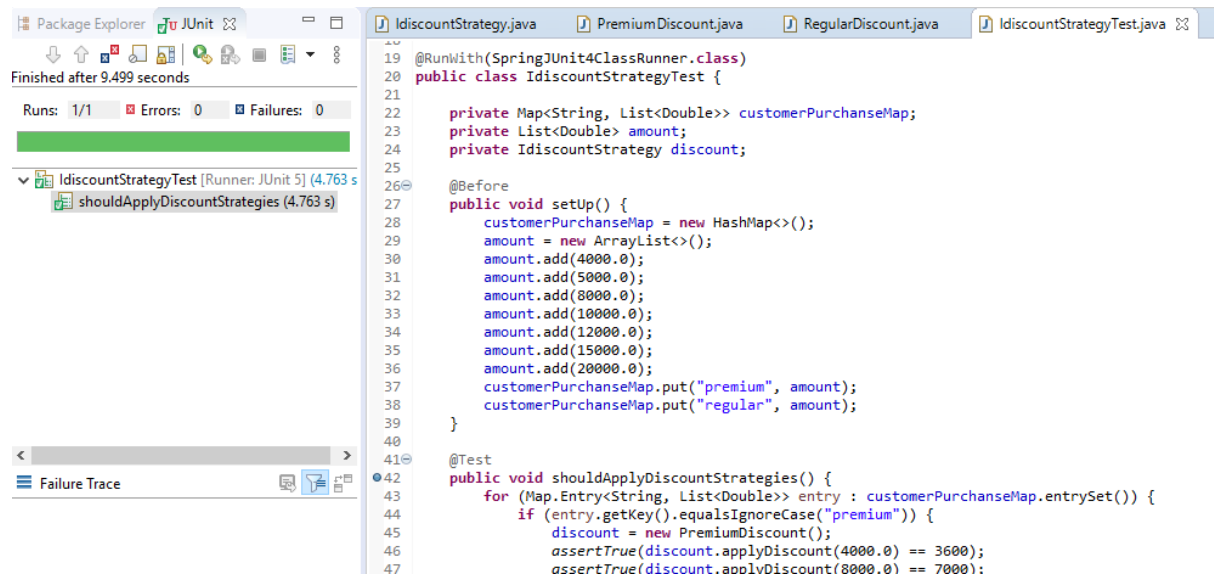
SOLID design principle is kept in mind while implementing the story.

## UML Diagram:

```
                    ┌──────────────────────────────┐
                    │          «interface»         │
                    │       IdiscountStrategy      │
                    │   applyDiscount(Double):Double│
                    └──────────────────────────────┘
                       ╱                          ╲
                      ╱                            ╲
   ┌──────────────────────────┐      ┌──────────────────────────┐
   │    PremiumDiscount        │      │    RegularDiscount        │
   ├──────────────────────────┤      ├──────────────────────────┤
   │ + applyDiscount(Double):  │      │ + applyDiscount(Double):  │
   │   Double                  │      │   Double                  │
   └──────────────────────────┘      └──────────────────────────┘
```

## Test:

Junit test is created to test the entire story.

```java
    IdiscountStrategy.java    PremiumDiscount.java    RegularDiscount.java    IdiscountStrategyTest.java ⊠
19  @RunWith(SpringJUnit4ClassRunner.class)
20  public class IdiscountStrategyTest {
21
22      private Map<String, List<Double>> customerPurchanseMap;
23      private List<Double> amount;
24      private IdiscountStrategy discount;
25
26      @Before
27      public void setUp() {
28          customerPurchanseMap = new HashMap<>();
29          amount = new ArrayList<>();
30          amount.add(4000.0);
31          amount.add(5000.0);
32          amount.add(8000.0);
33          amount.add(10000.0);
34          amount.add(12000.0);
35          amount.add(15000.0);
36          amount.add(20000.0);
37          customerPurchanseMap.put("premium", amount);
38          customerPurchanseMap.put("regular", amount);
39      }
40
41      @Test
42      public void shouldApplyDiscountStrategies() {
43          for (Map.Entry<String, List<Double>> entry : customerPurchanseMap.entrySet()) {
44              if (entry.getKey().equalsIgnoreCase("premium")) {
45                  discount = new PremiumDiscount();
46                  assertTrue(discount.applyDiscount(4000.0) == 3600);
47                  assertTrue(discount.applyDiscount(8000.0) == 7000);
```

## Project Structure:

```
∨ cdk-global-assignment [boot] [devtools]
    ∨ src/main/java
        > com
        ∨ com.cdk.constants
            > AmountConstants.java
        > com.cdk.exception
        ∨ com.cdk.service
            > IdiscountStrategy.java
            > PremiumDiscount.java
            > RegularDiscount.java
    ∨ src/main/resources
        > com
          static
          templates
          application.properties
          CDKGlobalAssignment.pdf
          ShoppingCart-CodingAssignment.pdf
    ∨ src/test/java
        ∨ com
            > CdkGlobalAssignmentApplicationTests.java
            > IdiscountStrategyTest.java
    > JRE System Library [JavaSE-1.8]
```

## Relevant Console Logs:

```
11:56:36.289 [main] DEBUG org.springframework.beans.factory.support.DefaultListableBeanFactory - Creating shared instance of singleton bean 'org.springframework.boot.test.mock.mock...
11:56:36.590 [main] DEBUG org.springframework.test.context.cache.DefaultCacheAwareContextLoaderDelegate - Storing ApplicationContext [1104443373] in cache under key [[MergedContext...
11:56:36.592 [main] DEBUG org.springframework.test.context.cache - Spring test ApplicationContext cache statistics: [DefaultContextCache@273e7444 size = 1, maxSize = 32, parentCont...
11:56:36.985 [main] DEBUG org.springframework.test.context.cache.DefaultCacheAwareContextLoaderDelegate - Retrieved ApplicationContext [1104443373] from cache with key [[MergedCont...
11:56:36.986 [main] DEBUG org.springframework.test.context.cache - Spring test ApplicationContext cache statistics: [DefaultContextCache@273e7444 size = 1, maxSize = 32, parentCont...
11:56:37.002 [main] DEBUG org.springframework.test.context.support.AbstractDirtiesContextTestExecutionListener - Before test method: context [DefaultTestContext@36902638 testClass ...
11:56:37.043 [main] DEBUG org.springframework.test.context.cache.DefaultCacheAwareContextLoaderDelegate - Retrieved ApplicationContext [1104443373] from cache with key [[MergedCont...
11:56:37.043 [main] DEBUG org.springframework.test.context.cache - Spring test ApplicationContext cache statistics: [DefaultContextCache@273e7444 size = 1, maxSize = 32, parentCont...
11:56:37.044 [main] DEBUG org.springframework.test.context.cache.DefaultCacheAwareContextLoaderDelegate - Retrieved ApplicationContext [1104443373] from cache with key [[MergedCont...
11:56:37.045 [main] DEBUG org.springframework.test.context.cache - Spring test ApplicationContext cache statistics: [DefaultContextCache@273e7444 size = 1, maxSize = 32, parentCont...
11:56:42.187 [main] DEBUG org.springframework.test.context.cache.DefaultCacheAwareContextLoaderDelegate - Retrieved ApplicationContext [1104443373] from cache with key [[MergedCont...
11:56:42.187 [main] DEBUG org.springframework.test.context.cache - Spring test ApplicationContext cache statistics: [DefaultContextCache@273e7444 size = 1, maxSize = 32, parentCont...
11:56:42.225 [main] DEBUG com.cdk.service.PremiumDiscount - In premium discount Strategy
11:56:42.225 [main] DEBUG com.cdk.service.PremiumDiscount - In premium discount Strategy
11:56:42.225 [main] DEBUG com.cdk.service.PremiumDiscount - In premium discount Strategy
11:56:42.225 [main] DEBUG com.cdk.service.PremiumDiscount - In premium discount Strategy


11:56:42.274 [main] DEBUG com.cdk.service.RegularDiscount - In regular discount Strategy
11:56:42.274 [main] DEBUG com.cdk.service.RegularDiscount - In regular discount Strategy
11:56:42.274 [main] DEBUG com.cdk.service.RegularDiscount - In regular discount Strategy
11:56:42.276 [main] DEBUG org.springframework.test.context.cache.DefaultCacheAwareContextLoaderDelegate - Retrieved ApplicationContext [1104443373] from cache with key [[MergedCont...
11:56:42.276 [main] DEBUG org.springframework.test.context.cache - Spring test ApplicationContext cache statistics: [DefaultContextCache@273e7444 size = 1, maxSize = 32, parentCont...
11:56:42.279 [main] DEBUG org.springframework.test.context.cache.DefaultCacheAwareContextLoaderDelegate - Retrieved ApplicationContext [1104443373] from cache with key [[MergedCont...
11:56:42.279 [main] DEBUG org.springframework.test.context.cache - Spring test ApplicationContext cache statistics: [DefaultContextCache@273e7444 size = 1, maxSize = 32, parentCont...
11:56:42.282 [main] DEBUG org.springframework.test.context.cache.DefaultCacheAwareContextLoaderDelegate - Retrieved ApplicationContext [1104443373] from cache with key [[MergedCont...
11:56:42.282 [main] DEBUG org.springframework.test.context.cache - Spring test ApplicationContext cache statistics: [DefaultContextCache@273e7444 size = 1, maxSize = 32, parentCont...
11:56:42.286 [main] DEBUG org.springframework.test.context.cache.DefaultCacheAwareContextLoaderDelegate - Retrieved ApplicationContext [1104443373] from cache with key [[MergedCont...
11:56:42.286 [main] DEBUG org.springframework.test.context.cache - Spring test ApplicationContext cache statistics: [DefaultContextCache@273e7444 size = 1, maxSize = 32, parentCont...
11:56:42.291 [main] DEBUG org.springframework.test.context.cache.DefaultCacheAwareContextLoaderDelegate - Retrieved ApplicationContext [1104443373] from cache with key [[MergedCont...
11:56:42.291 [main] DEBUG org.springframework.test.context.cache - Spring test ApplicationContext cache statistics: [DefaultContextCache@273e7444 size = 1, maxSize = 32, parentCont...
11:56:42.296 [main] DEBUG org.springframework.test.context.cache.DefaultCacheAwareContextLoaderDelegate - Retrieved ApplicationContext [1104443373] from cache with key [[MergedCont...
```