

Rules Engine Pattern

**Without Using
Pattern**



```
1  # Customer Class
2  class Customer:
3      def __init__(self, name: str, membership_level: str, age: int) -> None:
4          self.name = name
5          self.membership_level = membership_level
6          self.age = age
7
```

```
1  import classes
2
3  Customer = classes.Customer
4
5
6  class DiscountPercentageCalculator:
7
8      @staticmethod
9      def calculate(customer: Customer) -> float:
10         max_discount = 0.0
11         if customer.membership_level == "regular":
12             max_discount = max(max_discount, 0.10)
13         if customer.membership_level == "premium":
14             max_discount = max(max_discount, 0.20)
15         if 12 <= customer.age <= 14:
16             max_discount = max(max_discount, 0.25)
17         return max_discount
18
19
20 if __name__ == '__main__':
21     customer1 = Customer("Meena", "regular", 15)
22     customer2 = Customer("Raju", "premium", 12)
23     customer3 = Customer("Mithu", "regular", 12)
24
25     print(DiscountPercentageCalculator.calculate(customer1) * 100)
26     print(DiscountPercentageCalculator.calculate(customer2) * 100)
27     print(DiscountPercentageCalculator.calculate(customer3) * 100)
28
```

Using Rule Engine Pattern



```
1  # Customer Class
2  class Customer:
3      def __init__(self, name: str, membership_level: str, age: int) -> None:
4          self.name = name
5          self.membership_level = membership_level
6          self.age = age
7
```



```
1  from customer import Customer
2
3
4  # Discount Rule Interface
5  class IDiscountRule:
6      def apply_rule(self, customer: Customer) -> float:
7          pass
8
```



```
1  from customer import Customer
2  from discount_rule_interface import IDiscountRule
3
4
5  class DiscountRuleEngine:
6      def __init__(self):
7          self.rules = []
8
9      def add_rule(self, rule: IDiscountRule):
10         self.rules.append(rule)
11
12     def get_discount_percentage(self, customer: Customer):
13         max_discount = 0.0
14         for rule in self.rules:
15             discount = rule.apply_rule(customer)
16             max_discount = max(max_discount, discount)
17         return max_discount
18
```




```
1  from customer import Customer
2  from discount_rule_interface import IDiscountRule
3
4
5  # Regular Customer Rule
6  class RegularCustomerRule(IDiscountRule):
7
8      def apply_rule(self, customer: Customer):
9          if customer.membership_level == 'regular':
10              return 0.10  # 10% discount
11          return 0
12
```



```
1  from customer import Customer
2  from discount_rule_interface import IDiscountRule
3
4
5  class PremiumCustomerRule(IDiscountRule):
6
7      def apply_rule(self, customer: Customer):
8          if customer.membership_level == 'premium':
9              return 0.20  # 20% discount
10         return 0.0
11
```



```
1  from customer import Customer
2  from discount_rule_interface import IDiscountRule
3
4
5  # Teenage Customer Rule
6  class TeenageCustomerRule(IDiscountRule):
7
8      def apply_rule(self, customer: Customer):
9          if 12 <= customer.age <= 14:
10             return 0.25  # 25% discount
11         return 0.0
12
```

```
1  import os
2  import sys
3
4  from customer import Customer
5  from rules.regular_customer_rule import RegularCustomerRule
6  from rules.premium_customer_rule import PremiumCustomerRule
7  from rules.teenage_customer_rule import TeenageCustomerRule
8
9  from rule_engine import DiscountRuleEngine
10
11
12  parent_dir = os.path.abspath(os.path.join(os.path.dirname(__file__), ".."))
13  sys.path.append(parent_dir)
14
15  if __name__ == '__main__':
16      customer1 = Customer("Meena", "regular", 15)
17      customer2 = Customer("Raju", "premium", 12)
18      customer3 = Customer("Mithu", "regular", 12)
19
20      teenage_customer_rule = TeenageCustomerRule()
21      regular_customer_rule = RegularCustomerRule()
22      premium_customer_rule = PremiumCustomerRule()
23
24      discount_rule_engine = DiscountRuleEngine()
25      discount_rule_engine.add_rule(teenage_customer_rule)
26      discount_rule_engine.add_rule(regular_customer_rule)
27      discount_rule_engine.add_rule(premium_customer_rule)
28
29      print(f"{customer1.name}'s Discount: {discount_rule_engine.get_discount_percentage(customer1) * 100:.1f}%")
30      print(f"{customer2.name}'s Discount: {discount_rule_engine.get_discount_percentage(customer2) * 100:.1f}%")
31      print(f"{customer3.name}'s Discount: {discount_rule_engine.get_discount_percentage(customer3) * 100:.1f}%")
32
```