**Code explanation**

All scenarios are saved as cart in database with an ID. On web api receives a request for apply promotion (/api/v{version}/Cart/{Id}/Promotions). It will raise a GetCartTotalAfterPromotionsQuery query into Mediator pipeline which will execute the PromotionEngine on that cart

Overview of Promotion engine flow

Step 1) Get cart with id

Step 2) Get state of current cart- Different products , count of each product. This is kept in a persistence storage

Step 3) Get each product and its Promotions from persistence storage

Step 4) Each promotion keeps track of below things

* What is the type of promotion whether its has a combination of product or just one product.
* Minimum count of product needed for applying the promotion.
* Promotion Amount
* Whether it’s a percentage Promotion
* Start date
* End date

Step 5) Get the product and the minimum count of product needed for applying promotion.

Step 6) If it’s a single sku promotion then we divide the cart product count with the promotion minimum product count. Then we multiply the quotient of the division with promotion price and reminder with product price

Step 7) if it is a multiple sku promotion, the we check whether all the products which we need to be in the basket for promotion is available in cart. If it is then we apply promotion and if it is not then we will add the price of that product

Initial Setup

Product: Sku-A, price- 50, id-1

Product: Sku-B, price- 20, id-2

Product: Sku-C, price- 20, id-3

Product: Sku-D, price- 15, id-4

Promotion 1- minimum count :130, Products(SKU-A, Min Count:3,),Type:SingleKU

Promotion 2- minimum count :45, Products(SKU-B, Min Count:2), Type:SingleKU

Promotion 3- minimum count :130, Products([SKU-C, Min Count:1],[SKU-D,Count:1]) Type:MultipleSKU

Scenario 1 Cart id 1

1 \* A 50

1 \* B 30

1 \* C 20

Steps 1: 1/3=> Quotient – 0 , reminder ,1 = 1\*50= 50

Step 2 : 1/2=> Quotient – 0 , reminder ,1 = 1\*50= 30

Step 3 : check if C and D in cart => No => No promotion applied

Step 4: add 50 + 30 + 20 = 100

Scenario 2 Cart id 2

5 \* A 130 + 2\*50

5 \* B 45 + 45 + 30

1 \* C 20

Step 1 : 5/3=> Quotient – 1=> 130 \*1, reminder : 2 => 2\*50= 100=>100+130= 230

Step 2 : 5/2=> Quotient – 2=> 45 \*2, reminder : 1 => 1\*30= 30=>90+30=120

Step 3 : check if C and D in cart => No => No promotion applied

Step 4: 120+230+20 = 370

Scenario C

3 \* A 130

5 \* B 45 + 45 + 1 \* 30

1 \* C -1

1 \* D 30

Step 1 : 5/3=> Quotient – 1=> 130 \*1, reminder : 0 => 0\*50= 0=>130= 130

Step 2 : 5/2=> Quotient – 2=> 45 \*2, reminder : 1 => 1\*30= 30=>90+30=120

Step 3 : check if C and D in cart => yes => 30

Step 4: 250+30 = 280