Java Developer Assessment Solution:
- Filter based solution and implementation regarding user budget and history purchased items attributes frequency.
- Customer price preference and purchased product attributes including to filtering operation provided to customer personal based custom recommended recipes.
- Recipes naming based attribute filtering added to more realistic filtering on recommended products without extra tagging for products.

Dress Recammendation Service and Recipie Recommendation Research,
Recommendation System implemented via Machine Learning algorihtms or Deep Learning.
For my solution I do not have chance to implement machine learning based algorithm bacause of data requirements.

However better solutions have been completed researches in academic and professional researches.
- H&M has been created dataset and deep learning solution for personal based recommedation in 2022.
     https://www.kaggle.com/competitions/h-and-m-personalized-fashion-recommendations/overview/evaluation
- Amazon.com Item-to-Item Collaborative Filtering, Greg Linden, Brent Smith, and Jeremy York • Amazon.com
     https://www.cs.umd.edu/~samir/498/Amazon-Recommendations.pdf

Different Machine Learning and Deep Learning libraries and tool could be used to implement better solution based on data.

Business Advantage and Improvement: Gamification!
Customer: "This is MyRecipe for Long Travel! what's yours?"
Recommendation Service provides simple solution and non-learning supported algorihm.
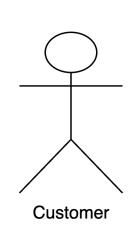However service and system is provide a new advantage on user experience and H&M.
With this system we are able to create data collection mechanism based on customers specification needs and ideas.
This system could provide to customers as gamification.
We are able to get more recipe, human created, more realistic recipes and tagging with this gamification.
We are able to create recipe sharing platform and while customers sharing their recipes they will adverting our products.

Customer

Website-UI Dress Recipes

Recommendation System

Customer Fills The Form.
- budget
- pricePreferences
- recipeName
- numOfRecipe

Select the % of budget to spend by each category of dress recipe. Request number of recipes for choice.

RecipeRequest
- customerId
- budget
- pricePreferences
- recipeName
- numOfRecipe

RecipeRequest
- 1
- 500 SEK
- Preferences
  - top: % 40,
  - bottom: %30,
  - Accessories: %10,
  - Shoes: %20
- Wedding
- 5

Analyse The Customer Budget
- Budget
- topClothesBudget
- bottomClothesBudget
- shoesBudget
- accessoriesBudget

Analyse The Customer History
Calculates
the customer purchase frequency
  - Colors
  - Styles
  - Materials
  - Seaons

Create Different Recipes with Results

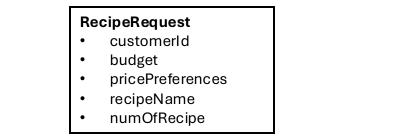**Customer Buy Selected Recipe and Add to Cart Pays**

Recipe A	Recipe B	Recipe C

Recipe A	Recipe B	Recipe C

RecipeRequest
- customerId
- budget
- pricePreferences
- recipeName
- numOfRecipe
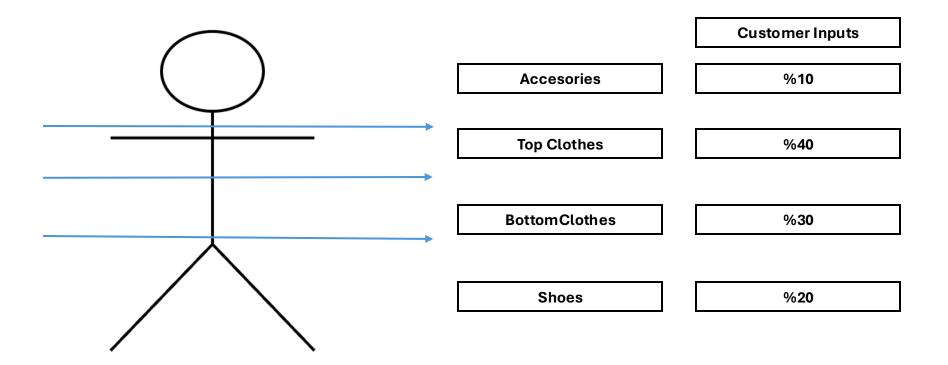
Recommendation System UI

POST api/v1/recommendations/recipes

Customer Budget Calculator
Calculates the customer budget for per part of dressing-clothing in order to provide full-dressing recommendation.

Exp:
topBudget = budget * (requestPricePreference / 100)

Customer Inputs
Accesories	%10
Top Clothes	%40
BottomClothes	%30
Shoes	%20

Customer

**Database
PurchaseHistory
PurchasedProductAttributes**

Customer History Frequency Analysis

Customer purchase history data was saved to database.
Get the customer history list from database.
Get all of the product attributes related to history.

- Calculate frequency map for .
  Expample Map:
  - Red: 4, Blue:2, Black:5
  - Linen:5, Cotton:2
  - Summer:3, Winter:2
  - Casual: 2, Formal:3, Sport :1
- Find the set of attributes for analysis usage
  - Colors: Red,blue,black
  - Materials: Linen, Cotton
  - Season: summer, winter
  - Style: casual, formal, sport.

- Find the favorites.
- Color : black, Material: linen, Style: Casual

HistoryAnalysis
- Map<String,Integer> colorFrequency
- Map<String,Integer> materialFrequency
- Map<String,Integer> seasonFrequency
- Map<String,Integer> styleFrequency
- Set<String> colors,
- Set<String> materials,
- Set<String> seasons,
- Set<String> style
- String favColor,
- String favMaterial,
- String favStyle

Recommendation System

RecipeRequest

Recipe name

Budget Calculation

totalNumOfRecipes

Database Product Tables

Products

Get Products by budget preferences calculation result

Customer Histoy based Filtered Products

Customer History Analysis

Database History Tables

Get the history data

RecommendedRecipe
- **Id,**
- **Name,**
- **Code,**
- **Products:List**

Customer Recipe Attributes based filtered products

Create Filter By Recipe tags for products.

Database Recipes Table

Database RecipeTags Table

Recipe

A

Recipe

B

Select the most expensive products Create recommended recipes

Recipe

C